International Buddhist Confederation
A-1 Wing, 5th Floor, IGNCA Building,
Janpath, New Delhi-110001
Tele phone No: - +91-11-23446519; +91-11-23446520
Email: - secretariat@ibcworld.org

NIT No.: 54/ LUMBINI/IBC/2022 (CW)
NAME OF WORK: "Construction of Building of India International Centre for Buddhist Culture and Heritage (IICBCH) including Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works and Operation and Maintenance (O&M) for Two Years at Lumbini, Nepal."

(All cost and amount of this tender document will be treated in INR only.)

ESTIMATED COST	**:**	**Rs. 100, 00, 00,000/-**
EARNEST MONEY	**:**	**Rs. 10,00,000/-**
TENDER FEE	**:**	**Rs. 50,000/-**
TIME ALLOWED	**:**	**18 Months**
PERFORMANCE GUARANTEE	**:**	**3% of tendered value**
Date of Pre bid meeting	**:**	**12:00 hrs on 14/12/2022 (The link will be shared to those who want to attend through web conference)**
Last date & time of Tender Submission	**:**	**13:00 hrs on 22/12/2022**
Date of Opening of technical bid	**:**	**12:00 hrs on 23/12/2022**

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It is certified that this document contains two parts i.e. Part A & Part B,

(M.S. Gusain)
Deputy Director, IBC
A-1 Wing, 5th Floor, IGNCA Building,
Janpath, New Delhi-110001

International Buddhist Confederation

Notice Inviting Tender/ Press Notice

The Deputy Director, International Buddhist Confederation, A-1 Wing, 5th Floor, IGNCA Building, Janpath, New Delhi -110001, on behalf of the International Buddhist Confederation invites single stage two envelope bids from eligible firms / contractors in two bid system for the following work: -

NIT No.: 54**/** LUMBINI/ IBC /2022 (CW)

NAME OF WORK: "Construction of Building of India International Centre for Buddhist Culture and Heritage (IICBCH) including Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works and Operation and Maintenance (O&M) for Two Years at Lumbini, Nepal."

Estimated cost	Rs. 100,00,00,000/-
Provisional Sum	Rs. 5,00,00,000/-
Period of Completion	18 Months.
EMD	Rs.10,00,000/-
TENDER FEE	50,000/-

The bid forms and other details can be obtained from the website www.ibcworld.org.The notice inviting e-tender is also available on www.ibcworld.org & secretariat@ibcworld.org from 12:00 hrs. 1st December 2022

(M.S. Gusain)
Deputy Director, IBC
A-1 Wing, 5th Floor, IGNCA Building,
Janpath, New Delhi-110001

PART-A

TECHNICAL BID

PART-I

GENERAL INFORMATION

INTERNATIONAL BUDDHIST CONFEDERATION
INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR e-TENDERING FORMING PARTOF BID DOCUMENT

The Deputy Director, International Buddhist Confederation, A-1 Wing, 5th Floor, IGNCA Building, Janpath, New Delhi -110001, on behalf of the International Buddhist Confederation invites single stage two envelope bid from eligible firms / contractors in two bid system for the following:

Sl. No.	NIT No.	Name of Work & location	Estimated cost put to tender	Earnest Money	Date and time of the release of tender document	Date and time of Prebid conference	Period of Completion	Last Date & time of submission of bid, Original EMD, Copy of receipt for deposition of original EMD and other documents as specified in NIT	Time and date of opening of Technical bid	Time and date of opening of Financial bid
1	IBC/LUMBINI/001	**NAME OF WORK:** "Construction of Building of India International Centre for Buddhist Culture and Heritage (IICBCH) including Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works and Operation and Maintenance (O&M) for Two Years at Lumbini, Nepal ."	100,00,00,000/-	10,00,000/-	12:00 hrs on 01/12/2022	12:00 hrs on 14/12/2022 (Through Web Conferencing)	18 Months	**13:00 hrs on 22/12/2022**	**12:00 hrs on 23/12/2022**	**To be decided later.**

1.0 **The following documents are to be furnished offline as part of the *Technical Bid* (COVER -1) *by* the Contractor**.

(i) Signed and scanned copy of PAN and GST Number.

(ii) Signed and scanned copy of the Certificate of Registration (CoR) from Central / State Govt. Agency.

(iii) Only Class-AA enlisted contractor with government of India and equivalent registration of any other countries for contractors outside India are eligible for bidding.

(iv) It is desirable that an office of the Contractor shall be available in the India for better communication & coordination with the firm during tendering and project execution.

(v) **Earnest Money Deposit** (EMD) (in original, hard copy) shall be submitted before the due date and time of opening of tender in form of Demand Draft from schedule bank but not from cooperative or Gramin bank in an acceptable form drawn in favor of **"India International Centre for Buddhist Heritage and Culture" payable at New Delhi**

(vi) Tender Terms Acceptance Letter;

(vii) Completion certificate of similar work, where in contract value, job value on completion, scheduled and actual completion date should be mentioned, has to be provided for this purpose. Certificates of Work

Experience/Completion Certificates issued by officer of the Department not below the rank of an Executive Engineer in case of PSUs/Government or senior officer/ manager in case of an autonomous body / organization / Institutions.

S.No.	Specific Construction Experience	Remarks
a	**Construction of Similar Works in Last 10 Years;** Three similar works of individual value not less than 40% (i.e.40 Cr.) of the estimated cost put to tender, OR Two similar works, each of value not less than 60% (i.e.60 Cr.) of the estimated cost, OR One similar work of value is not less than 80% (i.e.80 Cr.) of the estimated cost. * Similar work means at least three storeyed RCC framed building having MEP & HVAC services.	Certificates of Work Experience / Completion Certificates issued by officer of the Department not below the rank of an Executive Engineer in case of PSUs/Government or senior officer/ manager in case of an autonomous body / organization / Institutions
b	Contractor should have Concreting experience of 800 CuM in a month in a single Project.	(Certificate duly signed with Competent Authority).
c	The Contractor must have at least 1 High End Green/Net Zero Expert in their firm and the same been mobilized in the project for technology transfer after award of the Contract	(Credentials of Net Zero Expert to be furnished by the Contractor)

(viii) Scanned Copy of financial turnover for last three years (certified by Chartered Accountant to be attached during submission). The average turnover during the last three financial years should be at least 50% of the estimated cost (i.e Rs 50 Cr).

(ix) The Contractor should not have incurred any loss (Profit after tax should be positive) in the last three consecutive balance sheets. Duly audited and certified by the Chartered Accountant.

(x) The Contractor should have Positive Net Worth as on dated 31st March 2022; Certificate duly signed by the statutory auditor of the Contractor mentioning the net worth.

(xi) Solvency certificate from Indian scheduled bank for an amount **Rs. 20 Crores** (Date of issue should be during the period of this tender submission or else the validity period should be mentioned on the Solvency Certificate & this should cover up the tender submission period).

(xii) Information regarding any litigation, current or during the last five years, in which the Contractor is involved, the parties concerned, and the disputed amount.

(xiii) Self-Certified Declaration of not being blacklisted by any Central/ State Govt. / PSU in Form F.

(xiv) The written power of attorney by the Contractor in favor of the authorized signatory signing the bid to be furnished.

(xv) Personnel Requirement:

The Contractor shall provide details of the key personnel proposed for administration, execution and quality control of the Contract, and shall complete the following Schedule of Key Personnel which summarizes their qualifications and experience. The Contractor shall attached duly signed biographical

data/ CVs in support of his proposal. Engagement of the proposed personnel will be subject to the Employer's approval, and in case the Employer does not approve any of the proposed personnel the Contractor will be required to provide a replacement with equivalent or better qualifications, abilities and relevant experience. The contractor shall deploy staff at site to complete the work in time and following all the safety precaution at site for execution of the work.

S No	Designation	No's	Required Period from starting of project	Experiences
1	Project Manager	1	Full time	• Required Graduate in civil engineering from reputed institute of India or aboard. • Having minimum 15 Years' of Total experience in which 10 years' experience in building construction projects
2	Senior Engineer (Civil)	1	Full time	• Required Graduate in civil engineering from reputed institute of India or aboard. • Having minimum 10 Years' of Total experience in which 08 years' experience in building construction projects.
3	Senior Engineer (E&M)	1	Full time	• Required Graduate in Electrical / Mechanical engineering from reputed institute of India or aboard. • Having minimum 10 Years' of Total experience in which 08 years' experience in building construction projects.
4	Net Zero Expert	1	Part Time	• Required Graduate in Architecture/ engineering from reputed institute of India or aboard. • Having minimum 10 Years' of Total experience in which 08 years' experience in building construction projects. • Having 3 years of experience in Carbon Footprint & Life Cycle Analysis of building. Skilled to deliver net zero building Projects.
5	Quality Control Engineer (Civil)	1	Full time	• Required Graduate in civil engineering from reputed institute of India or aboard. • Having minimum 7 Years' of Total experience in which 05 years' experience in building construction projects.
6	Assistant Architect	1	Full time	• Required Graduate in Architecture from reputed institute of India or aboard. • Having minimum 7 Years' of Total experience in which 05 years' experience in building construction projects.

S No	Designation	No's	Required Period from starting of project	Experiences
7	Safety Expert	1	Full time	• Required any Graduate from reputed institute of India or aboard. • Having Health & Safety Certificates • Having minimum 5 Years' of Total experience in which 03 years' experience in building construction projects
8	Billing engineer/Surveyor/ Computer operator /Attendants	As per requirements	As per requirements	As per requirements
9	Parametric Design Architect/Consultant	1	Part Time	• Required graduate degree in architecture and post graduate degree in emergent technologies, design/digital architecture from reputed institute of India or abroad. • Having minimum 10 years of total experience in which 5 years in designing complex steel structures/canopies of minimum 25000 sqft in single project.
Note: Since the project is being undertaken in Nepal, local Nepal govt. rules require encouraging local employment – as per set rule & regulation. Accordingly, scope should exist for including appropriately qualified local support staff.				

Note:-

Any Contractor failing to meet the above stated Qualification criteria shall be summarily rejected and will not be considered for further Evaluation.

Following documents are to be furnished offline as part of the Financial Bid (COVER -2) by the Contractor:

Bill of Quantities (BOQ):

(xvi) The BOQ shall be furnished by the Contractor using the Schedule as per RFP and submitted along with the bidding documents.

2.0 **Evaluation of performance:**

Evaluation of the performance of contractors for eligibility shall be done by NIT approving authority or Committee constituted by him. All the eligible similar works executed and submitted by the Contractors in support of eligibility andany one of the ongoing works, may be got inspected by committee which may consist of client or any other authority as decided by NIT approving authority. The marks for the quality shall be given based on this inspection if inspection is carried out. Scoring method of evaluation: - The scoring for evaluation mentioned in these columns shall be done as given in Proforma given (as per FORM-D1) elsewhere in the agreement.

At the time of submission of bid, the Contractor shall have also to annexed the Scanned copy of an affidavit on Non-Judicial Stamp paper of Rs.10/- as under:

"I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in

IBC in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the PMC shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee."

3.0 The intending Contractor must read the terms and conditions of CPWD-8 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.

4.0 Information and Instructions for Contractors posted on website shall form part of bid document.

5.0 Bids shall be submitted physically only at IBC office at New Delhi. Agencies are advised to follow the instructions provided in the „Instructions to the Agency/Tenderer for the submission of the bids.

6.0 Intending Contractor are advised to visit again IBC website URL https://www.ibcworld.org at least 1 day prior to the closing date of submission of tender for any corrigendum /amendment.

7.0 The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen in the office of International Buddhist Confederation, A-1 Wing, 5th Floor, IGNCA Building, Janpath, New Delhi -110001 during the office hours on all days except on Saturday, Sunday & Public holidays or can be seen on website **https:/ibcworld.org/** free of cost.

8.0 The Technical cum Eligibility bid shall be opened first on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the eligibility bid shall be communicated to them at a later date.

9.0 Pre-Bid conference shall be held in the O/o IBC, A-1 Wing, 5th Floor, IGNCA Building, Janpath, New Delhi-110001(Through Video Conferencing) to clear the doubts of intending Contractors, if any. Tenderers should send by email all their queries, before pre-bid conference, latest by 15.00 hrs on 06/12/2022 to the office of IBC, A-1 Wing, 5th Floor, IGNCA Building, Janpath, New Delhi-110001 (Emailid: secretariat@ibcworld.org). As a result of pre-bid conference, certain modifications may be uploaded on the website, if felt necessary by the Department.

10.0 The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.

11.0 The building is targeted for minimum 5 Star GRIHA rating from GRIHA Council. The Contractors shall take reference of all necessary support and required facilities in order to secure this rating. Nothing extra on this account shall be payable.

12.0 This work requires engaging more than 20 nos. of labors / workers and therefore all necessary labour licenses shall be taken by contractor within the time limits as prescribed under Nepal government norms.

13.0 During the Pandemic Covid-19, the guidelines/ SOPs/protocols issued by Govt. of India/ Govt. of Nepal are to be followed at the place of work/ Site from time to time. The agency should adhere to these guidelines/ SOPs/protocols strictly and no hindrance & nothing extra shall be payable on account of this.

(M.S. Gusain)
Deputy Director, IBC
A-1 Wing, 5th Floor, IGNCA Building,
Janpath, New Delhi-110001

List of Mandatory Documents to be submitted within the period of bid submission:

1. For AA Class registered Indian contractors and Equivalent registered foreign contractors :

a. Scan copy Banker's cheque of commercial bank or Account payee DemandDraft of commercial bank or Fixed Deposit receipt (FDR) of commercial bank or insurance surety bonds and/or bank guarantee or e-bank guarantee (for balance amount as prescribed) of commercial bank against EMD.

b. Copy of receipt of deposition of original EMD. (Annexure- 5)

c. GST registration Certificate of the state in which the work is to be taken up, if already obtained by the Contractor.

   If the Contractor has not obtained GST registration as applicable, then in such a case the Contractor shall scan and upload undertaking with the bid document "If work is awarded to me, I/We shall obtain GST registration certificate within one month from date of receipt of award letter or before release of any payment by IBC, whichever is earlier, failing which I/We shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and/or for any action taken by IBC or GST in this regard".

d. Certificates of Financial Turnover from Chartered Accountant in Form A.

e. Banker's certificate /Net Worth Certificate in Form B/B1.

f. List of eligible similar nature of works completed in Form C and C2.

g. Bidding capacity as per Form C3.

h. Performance report of works (referred to in Form C and C2) in Form-D and D2.

i. Structure & Organization in Form-E.

j. Affidavit for "Proforma of Affidavit for Non - Black Listing" in Form F.

k. Signed copy of Letter of transmittal in Annexure-2.

l. AFFIDAVIT FOR NON-EXECUTION OF WORKS ON BACK TO BACK BASIS" on

   Non- judicial Stamp Paper of Rs. 100/- in Annexure-3.

m. Integrity pact signed by the Contractor in presence of witness (as per annexure 6).

CPWD
FORM 7/8

GOVERNMENT OF INDIA
INTERNATIONAL BUDDHIST CONFEDERATION

STATE
CIRCLE
DIVISION

ITEM RATE TENDER AND CONTRACT FOR WORKS

Tender for the work of "Construction of the Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works at Lumbini Monastic Zone, Nepal including Operation and Maintenance (O&M) for Two Years."

The Tenders are to be submitted physically up to 22/12/2022 before 13.00 Hrs at IBC Office Only.
The tenders will be opened at **23/12/2022 at 12.00 Hrs in** the presence of Contractors or their representatives who may wish to be present at their own cost in the office of the IBC, IGNCA Building at New Delhi

Issued to
(Contractor)……

Signature of the officer issuing the documents……
Designation –Deputy Director

Date of issue

TENDER

I/We have read and examined the notice inviting tender, Specifications applicable, Drawings, General Rules, and Directions, Conditions of Contract, Clauses of contract, and all other contents in the tender documents for the work.

I/We hereby tender for the execution of the work specified for the Deputy Director, IBC, New Delhi within the time specified in the schedule of quantities and in accordance with the specifications, drawings if any, and instructions in writing referred to in general rules, special rules and terms and conditions of contract.

I/We agree to keep the tender open for 90 days from the due date of submission thereof and not to make modifications to its rates, terms, conditions, etc.

I/We have deposited EMD for the prescribed amount in the office of the IBC, IGNCA building at New Delhi as per the bid document.

A copy of the Earnest Money Deposit receipt of the amount …… deposited in form of Insurance surety Bonds, Account Payee, Demand Draft, Fixed Deposit Receipt, Banker"s Cheque, or Bank Guarantee from any of the Commercial Banks, in an acceptable form drawn in favor of the "**International Buddhist Confederation"** payable at New Delhi is scanned and uploaded. If I/We, fail to furnish the prescribed performance guarantee within prescribed period. I/We agree the IBC or his successors, in office, shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely.

Further, If I/We, fail to commence work as specified. I/We agree the Deputy Director,IBC, New Delhi or on his behalf, in office, shall without prejudice to any other right or remedy, be at liberty to

forfeit the said Performance Guarantee absolutely. The said Performance Guarantee shall be guaranteed to execute all the work referred to in the tender document.

Further I/We agree that in case of forfeiture of Earnest money (in case of failure to furnish the prescribed performance guarantee within prescribed period)/performance guarantee as aforesaid, I/We shall be debarred for participation in the retendering process of the work.

I/We hereby declare that I/We shall treat the tender documents, drawings, and other records connected with the work as secret/confidential documents and shall not communicate information/derived therefrom to any person other than to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the Department.

Date

Signature of Contractor

Postal Address

Witness Address

Occupation

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the Deputy Director, IBC, New Delhi for a sum of Rs…….(Rupees The letters referred to below shall form part of this contract Agreement:

i)
ii)
iii)

For & on behalf of Deputy Director, IBC, New Delhi

Signature……

Designation…….

Dated….

PART-II

TECHNICAL CUM ELIGIBILITY BID

SECTION – I
Brief Particulars of the Work

1. The project is one of a kind in that it is a project of national pride as far as the Government of India and the people of India is concerned, as it showcase the importance and relevance of Buddhism in today's world. Considering the Buddha and his valued teachings originated in India and his place of birth is Lumbini, there is a strong connect that links these two countries (Nepal and India) and the larger world through the core message of Dharma preached by the Buddha.

2. The project is also critical from the point of view of its special association with our Honorable Prime Minister Shri Narendra Modi who laid the foundation stone of the project on May 16, 2022 at Lumbini. He was joined by Honorable Prime Minister of Nepal Shri Sher Bahadur Deuba. Successful completion of the project would indeed be considered as a major contribution to the heritage of Buddhism by India.

3. Salient details of the work for which bids are invited are as under:

The prestigious site Construction of the Building of India International Centre for Buddhist Heritage and Culture (IICBHC) is situated in Lumbini Nepal. Following is the brief detail of work under present tender. However, this scope is indicative only and not exhaustive.

1)

S.no	Name of work	Estimated cost	Period of completion
1	"Construction of Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works including Operation and Maintenance (O&M) for Two Years at Lumbini, Nepal."	**Rs. 100,00,00,000/-**	**18 Months**

2) The work is situated at: Lumbini Monastic Zone, Lumbini , Nepal.

2.1 Project Description

The IBC, New Delhi, India intends to develop a Buddhist Cultural Centre of international standards on a plot measuring 80m x 80m at Lumbini, within the Lumbini Monastic Zone Nepal, the sacred birth place of Lord Buddha. The pilgrims and visitors visiting this Center must be able to experience the divine surroundings as well as be able to interpret and collaborate on the various facets of the teachings of Buddhism. The chosen site for the building is not only a pilgrimage site but also a UNESCO World Heritage site. The approximate estimation of the project is in the range of INR 100 cr. There are number of state-of-the-art monastic structure built by different countries in the monastic zone. The IICBCH should stand out among these structures as unique building.

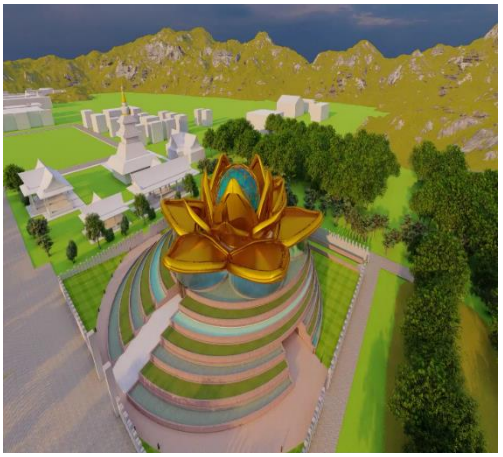
The project envisages a building conforming to Buddhist architectural principles and reflecting rich Indian Buddhist heritage that shall have a cultural Pavilion, state of the art interpretation center, library, meditation and multipurpose hall, auditorium, display and activity galleries guest rooms, cafeteria and offices, open space planning, parking and basement etc . It will have energy saving sustainable building features with earthquake resistance of Richter scale of 6.

2.2 Site Context & Physical Features

- Nepal officially the Federal Democratic Republic of Nepal is a multi-ethnic, multi-lingual, multi-religious and multi-cultural state, with Nepali as the official language.
- Lumbini is one of the holiest places of one of the world's great religions, and its remains contain important evidence about the nature of Buddhist pilgrimage. It is a Province in Western Nepal;
- **Climate: -** Lumbini experiences a Sub tropical climate with Moderate rainfall throughout the year.
- **Connectivity: -** Internationally connected via Tribhuvan International Airport and nationally connected Via Bhairahawa Airport (16 Kms); National Highways connecting Lumbini to rest of the country and Railway connectivity Via Siddharth Nagar Railway Station.

2.3 Concept of Building

Immediately after the birth, the future Lord Shakyamuni Buddha took seven steps to the north and lotus flowers sprang up in his footsteps, the famed Lotus Sutra is one of the most important texts of Mahayana Buddhism and is the foundation of the Pure Land schools. He looked around and announced'…this is my last birth; henceforth, there will be no rebirth for me' in the Lumbini garden.



Accordingly, the building form is derived from the seven steps and transformed into the seven steps with alternating water bodies and landscaped steps to reach the main level with the prayer hall.

2.4 Scope of Works

Scope of work includes "Construction of the Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works at Lumbini Monastic Zone, Nepal including Operation and Maintenance (O&M)" as per design & drawings attached and in line of BOQ as well as guidelines provided by the Client. All the drawings shall be provided by the Architect Consultant as appointed by IBC.

The proposed Building consists of Basement for Service and Parking, Ground Floor for accommodation, Gallery, Conference/ Board Rooms, and First Floor having the Prayer Hall, Meditation, Office and Restaurant Facility. The area of land is 1.37 acres The Proposed Building built-up area is of about 6261 Square Meters. The design of the building shall be shared by the Employer along with Auto CAD drawings.

Tentative areas of the facilities are given in the following

SPACE DESCRIPTION	UNITS	AREA
Prayer Hall	1	375 sqm.
Meditation Hall	2	240 sqm.
Art Gallery	1	165 sqm.
Interpretation Centre	1	320 sqm.
Library	1	95 sqm.
Conference Room	2	124 sqm.
Admin	1	120 sqm.
Board Room	1	115 sqm.
Office Area	1	35 sqm.
Guest Room	6	168 sqm.
Staff Quarters	4	200 sqm.
Reception	1	105 sqm.
Cafe	1	160 sqm.
Kitchen	2	110 sqm.
Store Room	2	40 sqm.
Toilet	3	160 sqm.
Foyer	1	545 sqm.
Corridor	1	220 sqm.

FLOOR AREAS

- Basement floor: 2745SQM
- Ground floor: 2350 SQM
- First floor: 1496.00 SQM

LOTUS STRUCTURE

- Surface Area: 8300.00 SQM
- Glass Dome: 330.00 SQM

TOTAL BUILT UP AREA: 6261.00 SQM

2.5 India International Centre for Buddhist Culture and Heritage is a (B+G+1) Museum building. The Contractor will construct the building on the basis of approved design/ drawings for the Civil, Mechanical, Electrical, and Public Health services (MEP Services).

2.6 Building will comply as per all the Standard specification, codes, BIS, IS, CPHEEO Manual, CPWD conditions/ guidelines along with the technical specification as specified under the document.

2.7 Contractor shall maintain Site order book, Lab Report, TPI Reports, MTC, Guarantee/ Warrantee of Equipments in proper manner and handover to the client during project completion and Contractor shall comply the number of test performed as per quantity and the same duly performed and checked by IBC/PMC time to time.

2.8 Contractor will follow all the instructions of PMC/ IBC.

2.9 Contractor will maintain highest degree of Quality control along Quality assurance.

2.10 Contractor will report the progress, mobilization of team, labor, equipment's, plants & machinery, Lab Testing, Survey & investigations, Health & Safety as per requirement of the project/ client.

2.11 Contractor has to submit the work schedule for the complete project duration and the same to be duly approved by the IBC.

2.12 Contractor shall provide all the drawing duly vetted by the IIT/ NIT or any reputed Engineering College.

2.13 Contractor shall provide the List of Makes (preferred Made of India) of all the material/equipment's/ as per design standard & specifications, approved in Class A category.

2.14 Contractor shall construct the building with initiatives of advance technology (Motion Sensors etc.) & Energy Efficient Sustainable Building.

2.15 INCLUSION OF NET ZERO APPROACH

Net zero approach Net-zero buildings combine energy efficiency and renewable energy generation to consume only as much energy as can be produced on site. Although achieving zero-energy and buildings is ambitious, it is an increasingly achievable goal.

Net Zero Energy Buildings are still connected to the electric grid, allowing electricity from grid to be used when renewable energy generation cannot meet the building's energy load.

A Zero Energy Building (ZEB), also known as a Net Zero Energy (NZE) building, or a Zero Net Energy (ZNE) building, is a building with net zero energy consumption, meaning the total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site or in other definitions by renewable energy sources offsite, using technology such as efficient cooling and heating system, high efficiency windows and insulation, solar panels, high efficient lighting, equipment etc.

This needs to be imply in the said building by appointing a Net Zero Expert by the firm and comply all the provisions

2.16 INCLUSION OF SUSTAINABLE INITIATIVES

- **Air Conditioning Systems**
  1. Heat pipes and thermal wheels specified for energy recovery in fresh air handler units.
  2. Condensate recovery to be used for irrigation or cooling tower make up water.
  3. Variable speed pumps and fans to be used where appropriate to save energy.
  4. These include carpark supply and extract fans and chilled water circulation pumps.

- **Facade Performance**
  High facade performance will greatly increase the building efficiency. Cooling loads will be reduced in apartments and hence cooling plant size and running costs will be reduced.

- **Lighting Control System**
  An intelligent lighting control system comprising of movement sensors, twilight sensors in some areas to control lights.

  High efficiency compact fluorescent luminaires with high frequency ballast shall be provided wherever possible.

  This needs to be imply in the said building by appointing a Net Zero Expert by the firm and comply all the provisions.

3) **Defects Liability Period:** 12 Months from the date of issuance of Certificate of Completion. Contractor shall provide adequate engineering, Building and supervisory staff for Repair / redevelopment inspection / monitoring of works on communication from PMC / IBC New Delhi, during Defect Liability Period (Two years) and necessary rectification of defects if observed, to be done by the Contractor as per guidance/observation of PMC/ IBC in line of applicable standards at no extra cost.

4) **Annual Maintenance Contract:** Contractor shall be responsible for repair & maintenance of the building for Two Years (24 Months) from the date of issuance of Certificate of Completion. It includes all kind of service activities those are required for building operational & function properly. No construction or procurement activities includes in this Head.

The period of the warranty shall be the total period of AMC during which any or all E & M components found to be defective shall be replaced or repaired free of charge and any shortcomings found in the system functioning as specified shall be removed at no extra cost. The Contractor shall provide the necessary personnel and tools for fulfilling the above period.

Note:

1. **Bid value of Operation and Maintenance (O&M) for 2 years has been fixed at a total of 4% of the total of all line items**
2. **Any hardware procured by the successful Contractor shall be with 2 years OEM warranty. In case, OEM is not providing 2 years warranty for any specific hardware, successful Contractor shall provide warranty on their own.**
3. **Yearly O&M amount paid in 4 equal quarterly instalments**

5) **The work shall be executed according to General condition of contract for Central P.W.D 2022 available separately and can be download from below link:**
https://cpwd.gov.in/Publication/GCC2022.pdf

6) **<u>Special conditions pertaining to Site Facilities/ Restrictions</u>**

i. The Agency shall work under the control of the Deputy Director, IBC, New Delhi.

ii. The work shall be carried out strictly as per standard codes of Civil Engineering and the contractor must follow all the standard practices of construction works.

iii. All materials specified by Architect Consultant shall be approved by PMC or its representative before use.

iv. The work shall be carried out in an engineering-like manner. The bad workmanship will not be accepted and defects shall be rectified at the contractor's cost to the satisfaction of the PMC.

v. Contractor shall establish an office at site with comply all the requirements (Furniture, Equipment's, Softwares, Communications, Electricity, Water, T&P, Internet Complete in all respect) along with establishment of separate lab testing room with required equipment's where testing of materials will be done prior to any procurement and during execution of site.

vi. Contractor shall maintain Site order book, Lab Report, TPI Reports, MTC, Guarantee/ Warrantee of Equipments in proper manner and handover to the client during project completion and Contractor shall comply the number of test performed as per quantity and the same duly performed and checked by IBC/PMC time to time.

vii. The Equipment's/plants to be used in the project shall be furnished by the contractor to the Engineer well in advance of commencement of work and approval of the Engineer is obtained prior to its adoption and use.

viii. In case objection is raised by the nearby locality regarding the installation of batch mix plant at site then no concrete plant / batch mix plant/ ready mix plant shall be allowed inside the campus. Nothing extra shall be paid on this account.

ix. The Contractors are required to visit the site and check the feasibility of space required for steel yards, stores, site laboratory etc. and installation of various tools and plants such as tower crane, builder & passenger hoists,DG sets etc. The contractor shall make his own arrangement for establishment of the above-mentioned facilities and for which nothing extra shall be paid. The PMC/IBC shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained.

x. The space for establishment of labour hutment shall only be provided only if available. The contractor shall make his own arrangement for erection of labour hutment and for which nothing extra shall be paid. The PMC/IBC shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained.

xi. The Contractor shall carry out concreting/construction activities after sun set with the approval of PMC/IBC for which nothing extra shall be paid.

xii. No Equipment or personnel will be removed from the site without permission of IBC/ PMC.

xiii. Contractor is sole responsible for 100% safety of equipment's / Manpower and follow all the safety standard guidelines and imply during the construction of works. Safe Diversions arrangement like safety ribbons, safety cone, diversion information board and other required shall be done by Contractor at his own cost.

xiv. Two full time security guard will be deployed in the construction area by constructor, a temporary guard room in the main gate of the site may be established. No extra will be paid in this regard.

xv. Pre-Construction Inspection, Testing & Review of Data for Materials, Plant & Equipment:

The contractor shall place order for the material and the equipment only after the approval of the PMC. The Contractor shall submit the detailed drawings for the approved manufacturer and the procedure of submission, review and revision shall be specified herein below.

The Contractor shall inform the PMC about the likely dates of manufacturing, testing and dispatching. The Contractor shall notify the PMC for Inspection and Testing, at least twenty eight days prior to packing and shipping and shall supply the manufacturer's test results and quality control certificates. The PMC will decide whether he or his representative will inspect and test the material/ equipment or whether he will approve it on the basis of manufacturer's certificate. The contractor shall bear all expenses towards inspection activities including travelling expenses.

Contractor is responsible for third party inspection of complete work at his own cost. Contractor will submit three names for third party agency to the Department and department will approve a name of third party agency. Three names of third party agency should have experience as a third party in similar nature of work in minimum two projects. This third party agency will visit at work fortnightly minimum and will submit the report of satisfactory work as per approved design and drawings. Payment of civil works will be made to the Contractor after satisfactory report of third party agency. The contractor may arrange any NIT/IIT for this work. IIT/NIT will be exempted for above said experience.

xvi. The contractor shall make its own arrangement for tapping of electricity, for which necessary prevailing charges shall be paid by the contractor to the electricity statutory body or shall obtain separate independent connection for electricity. Before tendering, the Contractors shall visit the site and assess the manner in which he/she is able to arrange the above facilities. The PMC shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained.

xvii. Water for construction purposes shall be responsibility of contractor.

xviii. The Contractor shall abide by the rules/ bye laws applicable in respect of water/ electricity connection and he shall be solely responsible for any penalty on account of violation of any of the rules / bye laws in this regard. The Contractor shall indemnify the PMC against any claim arising out of pilferage, theft, damage, penalty, non-settlement of bills etc. whatsoever on this account.

xix. Space for site office and site store yard shall be provided in the vicinity of site as far as possible depending upon availability. The PMC shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained. The agency shall be required to establish all such facilities and for which nothing extra shall be paid. It shall be responsibility of agency to transport the material from material stacking yard to site and for which nothing extra shall be paid. In case any building or infrastructure work is required to be executed on the land occupied by the site office/site store/workers rest room/ labour camp, agency shall relocate these shelters for which nothing extra shall be paid.

xx. The agency shall be required to strictly follow security norms and procedure in terms of entry/ exit passes to all the vehicles/ persons/ materials, issue/ reissue/ surrender of labour passes and other rules and regulations that will be brought in force from time to time by IBC/ local body. Any penalty imposed by IBC for violating security norms will be immediately paid by the agency for which nothing extra shall be paid.

xxi. The liasioning for obtaining any local body approvals, CFO NOC, plinth level approval, Occupancy Certificate/ Part Occupancy Certificate shall be in scope of the contractor.

xxii. The agency shall be required to fix/install the dense safety net all around the periphery of the building as per progress of work, in order to ensure safety and prevent the damage to the materials & manpower working below:

xxiii. There are HT lines passing near to the campus. The agency shall make aware himself/herself of it.

xxiv. **SAFETY CODE:** The proposed works are within in city boundaries and crowded areas. It will be the responsibility of the contractor to not only follow the safety codes but also ensure the compliance of other instructions and needs according to the site to ensure that no worker or by stander is harmed. All the applicable safety codes of the Bureau of Indian Standards are to be applicable as per the specific requirements

SECTION – II
INFORMATION AND INSTRUCTIONS FOR CONTRACTORS

1. GENERAL:

1.1. Letter of transmittal and forms for deciding eligibility are given in Section III.

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

1.3. References, information and certificates from the respective clients certifying suitability, technical knowledge or capability of the Contractor should be signed by an officer not below the rank of Executive Engineer or equivalent.

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

2. DEFINITIONS:

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

2.2 **EMPLOYER**: Means the **International Buddhist Confederation**, acting through the Deputy Director, IBC, A-1 Wing, 5TH Floor, IGNCA Building, Janpath New Delhi-110001

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

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

2.5 User/Client/OWNER: shall mean International Buddhist Confederation**.**

3. METHOD OF APPLICATION:

3.1 If the Contractor is an individual, the application shall be signed by him above his full typewritten name and current address.

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

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

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

4. CONFLICT OF INTEREST: A Contractor shall not have a conflict of interest. All Contractors found to have a conflict of interest shall be disqualified. A Contractor may be considered to be in a conflict of interest with one or more parties in the bidding process if including but not limited to:

a) they have controlling shareholders in common; or
b) they receive or have received any direct or indirect subsidy from any of them; or
c) they have the same legal representative for purposes of this bid; or
d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the bid of another Contractor, or influence the decisions of the Employer regarding this bidding process; or
e) a Contractor or any affiliated entity, participated as a Consultant in the preparation of the design or technical specifications of the works that are the subject of the bid; or a Contractor was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the contract.

5. JOINT VENTURE/ CONSORTIUM:

Joint Venture is not allowed but MOU with Net Zero expert is mandatory.

6. FINAL DECISION-MAKING AUTHORITY:

5.1 The employer reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time, without assigning any reason or incurring any liability to the Contractors.

5.2 As the project is outside India, GRIHA and CPWD norms mentioned in this tender document are for reference only and can be modified by IBC/Consultant Architect as and when required.

5.3 The time duration of the project is fixed at 18 months which have to be followed strictly, exceeding which the extra remuneration of the prolonged period of consultant architect and PMC shall be deducted by IBC from the bills and security deposits of contractor.

7. PARTICULARS PROVISIONAL:

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

8. SITE VISIT:

The Contractor is advised to visit the site of work, at his own cost, and examine it and its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment.

9. Defects Liability Period : DLP period is of 24 Months from the date of issuance of Certificate of Completion. Contractor shall provide adequate engineering, Building and supervisory staff for Repair/ redevelopment, inspection / monitoring of works on communication from PMC/IBC, during Defect Liability Period (Two years) and necessary rectification of defects if observed, to be done by the Contractor as per guidance/observation of PMC/ IBC in line of applicable standards at no extra cost.

10. Operation and Maintenance : Contractor shall be responsible for repair & maintenance of the building for Two Years (24 Months) from the date of issuance of Certificate of Completion. It includes all kind of service activities those are required for building operational & function properly. No construction or procurement activities includes in this Head.

The period of the warranty shall be the total period of O&M during which any or all E & M components found to be defective shall be replaced or repaired free of charge and any shortcomings found in the system functioning as specified shall be removed at no extra cost. The Contractor shall provide the necessary personnel and tools for fulfilling the above period.

Note:

1. **Bid value of Operation and Maintenance (O&M) for 2 years has been fixed at a total of 4% of the total of all line items**
2. **Any hardware procured by the successful Contractor shall be with 2 years OEM warranty. In case, OEM is not providing 2 years warranty for any specific hardware, successful Contractor shall provide warranty on their own.**
3. **Yearly O&M amount paid in 4 equal quarterly instalments**

11. INITIAL CRITERIA FOR ELGIBILITY FOR QUALIFICATION:

11.1. The Contractor should have satisfactorily completed the works during the last ten years ending last date of the month previous to the one in which tenders are invited. For this purpose, cost of work shall mean gross value of the completed work including cost of material supplied by the Government/client but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer/Project Manager or equivalent.

a) Experience of having completed works of similar nature: -

Completion certificate of similar work, where in contract value, job value on completion, scheduled and actual completion date should be mentioned, has to be provided for this purpose. Certificates of Work Experience/Completion Certificates issued by officer of the Department not below the rank of an Executive Engineer in case of PSUs/Government or senior officer/ manager in case of an autonomous body / organization / Institutions.

S.No.	Specific Construction	Remarks

	Experience	
a	Construction of Similar Works in Last 10 Years; Three similar works of individual value not less than 40% (i.e.40 Cr.) of the estimated cost put to tender, OR Two similar works, each of value not less than 60% (i.e.60 Cr.) of the estimated cost, OR One similar work of value is not less than 80% (i.e.80 Cr.) of the estimated cost. * Similar work means at least three storeyed RCC framed building having MEP & HVAC services.	Certificates of Work Experience / Completion Certificates issued by officer of the Department not below the rank of an Executive Engineer in case of PSUs/Government or senior officer/ manager in case of an autonomous body / organization / Institutions
b	Contractor should have Concreting experience of 800 CuM in a month in a single Project.	(Certificate duly signed with Competent Authority).
c	The Contractor must have at least 1 High End Green/Net Zero Expert in their firm and the same been mobilized in the project for technology transfer after award of the Contract	(Credentials of Net Zero Expert to be furnished by the Contractor)

b) Average financial turnover: -

Scanned Copy of financial turnover for last three years (certified by Chartered Accountant to be attached during submission). The average turnover during the last three financial years should be at least 50% of the estimated cost (i.e Rs 50 Cr).

c) Profit/Loss: -

The Contractor should not have incurred any loss (Profit after tax should be positive) in the last three consecutive balance sheets. Duly audited and certified by the Chartered Accountant.

d) Net Worth Certificate: -The Contractor should have Positive Net Worth as on dated 31st March 2022; Certificate duly signed by the statutory auditor of the Contractor mentioning the net worth.

e) Solvency certificate:- The Contractor submit the certificate from scheduled bank for an amount Rs. 20 Crores (Date of issue should be during the period of this tender submission or else the validity period should be mentioned on the Solvency Certificate & this should cover up the tender submission period).

f) Bidding Capacity :-

The bidding capacity of the contractor should be equal to or more than the estimated cost ofthe work put to tender. The bidding capacity shall be worked out by the following formula: Bidding capacity = {[AxNx1.5]-B}

A= Maximum turnover in construction works executed in any one year during the last seven 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.

Note: The Contractor should submit bidding capacity as per FORM C3.

g) The Contractor should not have been barred/blacklisted by the Central Government/State Government/Nepal Government, or any entity controlled by it, from participating in any tender, and the bar subsists as on the Bid Due Date, such Contractor would not be eligible to submit the BID. The Contractor should upload affidavit for NON – BLACK LISTING in Form F.

At the time of Submission of bid, the Contractor shall have also to Submit the Scanned copy of an affidavit on Non-Judicial Stamp paper of Rs.10/- as under:

"I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in IBC in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee."

h) The Contractor should sufficient no. of Technical & Administrative employees for proper execution of contract.

The Contractor shall provide details of the key personnel proposed for administration, execution and quality control of the Contract, and shall complete the following Schedule of Key Personnel which summarizes their qualifications and experience. The Contractor shall attached duly signed biographical data/ CVs in support of his proposal & mobilize the personnel within 15 days of award of work.

S No	Designation	No's	Required Period from starting of project	Experiences
1	Project Manager	1	Full time	• Required Graduate in civil engineering from reputed institute of India or aboard. • Having minimum 15 Years' of Total experience in which 10 years' experience in building construction projects
2	Senior Engineer (Civil)	1	Full time	• Required Graduate in civil engineering from reputed institute of India or aboard. • Having minimum 10 Years' of Total experience in which 08 years' experience in building construction projects.
3	Senior Engineer (E&M)	1	Full time	• Required Graduate in Electrical / Mechanical engineering from reputed institute of India or

S No	Designation	No's	Required Period from starting of project	Experiences
				aboard. • Having minimum 10 Years' of Total experience in which 08 years' experience in building construction projects.
4	Net Zero Expert	1	Part time	• Required Graduate in Architecture/ engineering from reputed institute of India or aboard. • Having minimum 10 Years' of Total experience in which 08 years' experience in building construction projects. • Having 3 years of experience in Carbon Footprint & Life Cycle Analysis of building. Skilled to deliver net zero building Projects.
5	Quality Control Engineer (Civil)	1	Full time	• Required Graduate in civil engineering from reputed institute of India or aboard. • Having minimum 7 Years' of Total experience in which 05 years' experience in building construction projects.
6	Assistant Architect	1	Full time	• Required Graduate in Architecture from reputed institute of India or aboard. • Having minimum 7 Years' of Total experience in which 05 years' experience in building construction projects.
7	Safety Expert	1	Full time	• Required any Graduate from reputed institute of India or aboard. • Having Health & Safety Certificates • Having minimum 5 Years' of Total experience in which 03 years' experience in building construction projects
8	Billing engineer/ Surveyor/ Computer operator/ Accountant/ Attendant etc.	As per requirement	As per requirement	As per requirement
9	Parametric Design Architect/Consultant	1	Part Time	• Required graduate degree in architecture and post graduate degree in emergent technologies, design/digital

S No	Designation	No's	Required Period from starting of project	Experiences
				architecture from reputed institute of India or abroad. • Having minimum 10 years of total experience in which 5 years in designing complex steel structures/canopies of minimum 25000 sqft in single project.
Note: Since the project is being undertaken in Nepal, local Nepal govt. rules require encouraging local employment – at least to some extent. Accordingly, scope should exist for including appropriately qualified local support staff.				

12. EVALUATION CRITERIA:

Evaluation of the performance of contractors for eligibility shall be done by NIT approving authority or Committee constituted by him. All the eligible similar works executed and submitted by the Contractors in support of eligibility and any one of the ongoing works, may be got inspected by committee which may consist of client or any other authority as decided by NIT approving authority.

9.1 The detailed submitted by the Contractors will be evaluated in the following manner: -

The initial criteria prescribed in **Para 7.0** above in respect of experience of eligible similar works completed, loss, solvency, financial turn over and bidding capacity etc. will first be scrutinized and the Contractor's eligibility for the work will be determined.

13. FINANCIAL INFORMATION:

Contractors should furnish the Annual financial statement for the last 3 years **(in Form "A")** And Bank Solvency Certificate **(In Form "B")** OR Net Worth Certificate **(In Form "B1").**

14. EXPERIENCE OF SIMILAR WORKS:

Contractor should furnish the following:

(a) List of eligible similar nature of work successfully completed during the last 10 years **(In Form "C").**

15. ORGANISATION INFORMATION:

Contractor is required to submit information in respect of his organization **(in Form "E").**

16. LETTER OF TRANSMITTAL:

The Contractor should submit the letter of transmittal (Annexure-2) attached with documents.

17. OPENING OF PRICE BID:

After evaluation of applications, a list of short-listed agencies will be prepared. Thereafter, the financial bids of only the qualified and technically acceptable Contractors shall be opened at the notified time, date and place in the presence of qualified Contractors or their representatives. The bid shall remain valid for a period of

75 days after the date of opening of technical cum eligibility bid.

18. AWARD CRITERIA:

15.1 The employer reserves the right, without being liable for any damages or obligation to inform the Contractor, to:

(a) Amend the scope of work and value of contract.
(b) Reject any or all the applications without assigning any reason.

15.2 Any effort on the part of the Contractor or his agent to exercise influence or to pressure the employer would result in rejection of his bid. Canvassing of any kind is prohibited.

19. TERMS OF PAYMENTS

19.1 Running Bills shall be raised once in 30 days and shall be subject to a minimum of INR. 100.00 Lakhs (One Hundred Lakhs) net payable amount after adjusting recoveries of Mobilization advances. Necessary Retention shall be made from all Running Bill payments.

19.2 Payment should be released within 21 days from the date of bill submission. Failing to make a payment within the time resulting the extension of the project accordingly. Same shall be consider in total project duration.

19.3 Any taxes and/or other Governmental levies as applicable or becoming applicable later due to or under any law shall be reimbursed extra as actual and as per applicable laws of Nepal Authority.

19.4 No mobilization/secured advance will be given.

20. Exemptions of taxes by Government of Nepal :

a. Exemptions of payment of all custom duties taxes including VAT & CESS on any material or equipment imported from India by the executing agency

b. Refund of VAT and related taxes in respect of any material, equipment purchased or procured in Nepal in the Project. The executing agency shall submit the necessary request with VAT Bills to the Inland Revenue Office of Govt. of Nepal for reimbursement and Inland Revenue office of Govt. of Nepal will reimburse the paid VAT within the prescribed time, in accordance with the VAT act and regulations of Govt. of Nepal.

c. Double Tax avoidance agreement signed between the two countries on 18 January 1987 shall be applicable in the case of income tax for any Indian national or Indian firm employed by the Govt. of India as a consultant or contractor in connection with the project.

d. Emphasis should be given that material for the project is manufactured in India OR Nepal. Nevertheless the special kind of material and equipment shall be imported from other countries, if required.

19.5 The “Contractor” shall provide a Performance Guarantee in the prescribed Performance of 3% of the tendered amount. The Performance Guarantee submitted by the “Contractor” shall be valid up to 60 days beyond the completion of work. In addition to

this security deposit of 5% of the tendered amount shall be deducted from the bills

19.6 For the purpose of this tender document "Contractor", "Agency" and "Contractor" are synonymous.

19.7 The department shall have the right to withhold payment due to the contractor under this agreement in the event of any breach of the terms and conditions of the contract. The opinion of the Deputy Director, IBC New Delhi or his authorized representative on this aspect shall be final. No interest shall be allowed on payment withheld when released.

19.8 The payment will be released to the agency by the Deputy Director, IBC after obtaining the running/Final Bill.

19.9 For any delay in completion of the work other than by any exceptionally inclement weather, a penalty at 1% of tendered amount per month (Rs ….. per day) will be liable to the contractor. Provided that the total that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the tendered amount.

19.10 Contractor is required to accommodate PMC/ IBC for Third Party Inspection of Material, Equipment's, etc. prior to procurement of peculiar items. The expenditure incur during the inspection (Travel Tickets, Lodging, Boarding accommodation, Local Travel etc.), will be borne by Contractor and the same will be reimbursed under the head Provisional Sum

19.11 Contractor shall provide the well-established (Furnished with completely Equipped) office at Site and arrange accommodation along with 1 no's of Vehicles (4-Wheeler-SUV not below 2020 Model with Diesel / Petrol and Driver) for the IBC/ Architect Consultant team / PMC during the complete tenure of the project.

19.12 Specific Services Requirement :If any additional specific services of experts/ institutions are required for the project; the same will be arrange by the Contractor and the same will be reimbursed under the head of Provisional Sum

19.13 Price Variation:-The quantity may increase or decrease. Also, there may be chance of variation w.r.t drawing and design attached, depending upon time and condition at the time of execution of work. The quantity/ items may be increased at the time of execution. The rate for the extra/ Excess item will be decided as per latest CPWD BSR. In case any item not found in latest CPWD BSR, than market rate analysis will be applicable. In above both cases tender premium (TP) will be applicable to Contractor 10% (fixed) only on latest CPWD BSR / Market rate.

19.14 PROVISIONAL SUM:- The following task shall be reimbursed by the Contractor under the head of Provision Sum;

a) Survey & Investigation:
b) Workshop/ Trainings
c) Third Party Inspection
d) Specific Services Requirement
e) Vetting of Drawings from NIT/IIT/Engineering Colleges
f) IBC/ Architect Consultant team / PMC Facility Requirements
g) Any other requirement during the course of project.

20.0 AGENCY'S OBLIGATION

20.1 The "Contractor" is obliged to work closely with the department staff, act within its authority, and abide by directions issued by the PMC for implementation of works.

20.2 The "Contractor" will abide by the job safety measures prevalent in India as per Government norms and will free the Department from all the demands or responsibilities arising from accidents or loss of life the cause of which is the agency‟s negligence. The Agency will pay all indemnities/compensation arising from such incidents and will not hold the Department responsible or obligated.

20.3 Any corrections/cuttings in the Tender document shall be initialed by the Contractor

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SECTION -III

Annexure-2

LETTER OF TRANSMITTAL

From: -

To:

Deputy Director,
International Buddhist Confederation,
A-1 Wing, 5th Floor, IGNCA Building,
Janpath, New Delhi-110001.

Sub: Submission of bids for the works of "Construction of Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works at Lumbini, Nepal including Operation and Maintenance (O&M) for Two Years".

Sir,

Having examined the details given in the bid document for the above work, I/we hereby submit the relevant information.

1. I/We hereby certify that all the statements made and information supplied in the enclosed Forms from FORM- A, to E, and accompanying statement are true andcorrect.

2. I/We have furnished all information and details necessary for eligibility and have no further pertinent information to supply.

3. I/We, submit the requisite certified bank solvency/ net worth certificate and authorize the Director, International Buddhist Confederation, A-1 Wing, 5th Floor, IGNCA Building, Janpath, New Delhi to approach the Bank issuing the bank solvency/net worth certificate to confirm the correctness thereof.

4. I/We, also authorize Director, IBC, Bew Delhi to approach individuals, employers, firms and corporation to verify our competence and general reputation.

5. I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible similar works:

Name of Work:	Certificate from

Certificate:

It is certified that the information given in the enclosed eligibility bid are correct. It isalso certified that I / We shall be liable to be debarred, disqualified / cancellation of enlistment in case any information furnished by me / us is found to be incorrect.

Enclosures:

Seal of Contractor

Date of submission: Signature(s) of

Contractor(s).

FORM- "A"

FINANCIAL INFORMATION

Name of the firm / Contractor……:

1. **Financial Analysis-** Details to be furnished duly supported by figures in balance sheet / profit & loss account for the last Three financial years duly certified and audited by the Chartered Accountants, as submitted by the applicant to the Income Tax Department (Copies to be attached).

(Figures in Lakhs Rs.)

Year	**2019-20**	**2020-21**	**2021-22**
Gross Annual Turnover on Constructionworks			
Profit/loss (standalone financestatementand consolidated financial statement both)			

2. Financial arrangements for carryout the proposed work.

SIGNATURE (S) OF CONTRACTOR (S) **Signature of Chartered Accountant with Seal**

FORM "B"

FORM OF BANKERS' SOLVENCY CERTIFICATE FROM A SCHEDULED BANK

"To Whomsoever It May Concern"

This is to certify that to the best of our knowledge and information that M/s. / Shri……..

……

having marginally noted address, a customer of our bank are/is respectable and can be

treated as good for any engagement up to a limit of Rs.……

(Rupees……).

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature of Branch Manager)
For the Bank

NOTE:

1) In case of partnership firm, certificate should include names of all partners as recorded with the Bank.
2) Bank Certificates should be on letter head of the bank, addressed to tendering authority.

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FORM "B1"

FORM OF CERTIFICATE OF NET WORTH FROM CHARTERED ACCOUNTANT (Not more than three months old)

"It is to certify that as per audited balance sheet and profit & loss account during the financial year……., the net worth of M/S./Sh ..... (Name & Registered Address of individual/firm/company), as on..... (the relevant date) is Rs ..... after considering all liabilities. It is further certified that the net worth of the company has not eroded by more than 30% in the last three years ending on (the relevant date)."

Unique document identification number (UDIN)……

Signature of Chartered Accountant……

Name of Chartered Accountant……

Membership No. of ICAI

Date & Seal

FORM "C"

DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING THE TEN YEARS ENDING LAST DATE OF THE MONTH PREVIOUS TOTHE ONE IN WHICH TENDERS ARE INVITED

Sl. No.	Name of work / Project and Location	Owner or sponsoring Organization	Cost of work in crores of rupees	Date of commencement as per contract	Stipulated date of completion	Actual dateof completion	Litigation / arbitration cases pending / in progress with details*	Name and address/ telephone no of officer to whom reference may be made	Whether the work was done on back-to-back basis Yes/ No
1	2	3	4	5	6	7	8	9	10

Indicate gross Amount Claimed and Amount Awarded by the Arbitrator.

SIGNATURE (S) OF CONTRACTOR (S)

FORM 'C'-2

DETAIL OF ONE WORK IN SUPPORT OF HAVING SUCCESSFULLY COMPLETED WITH THE STRUCTURAL SYSTEM TECHNOLOGY PROPOSED TO BE USED IN THE WORK

Sr no	Name of work / project and location	Owner or sponsoring organization	Cost of work Crores of Rupees	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Type of structural system technology used.	Litigation / arbitration cases pending/ in progress with details	Name and Address (Postal Address & E-mail) / telephone number/Mobile number of officer to whom reference may be made	**Whether the work was done on back to back basis Yes/ No**
1	2	3	4	5	6	7	8	9	10	11

Signature of Contractor

Form C-3

Form for Contractor's Bidding Capacity

Name of the Firm / Contractor: -……..

NAME OF WORK:

Sr no	Name of work/Project and location	Owner or sponsoring organization	Contract value in crores of Rs	Date of commencement asper contract	Stipulated date of completion	U[to date % progress of work	Remaining work in %(100- column 7)	Existing commitment Column 4 X Column 8/100	Name and address /telephoneNumber of officer to whom Reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10	11
Total (B) =										

Maximum turnover in last 7 years = Rs……

Updated value of turnover (A) = Rs……..

No. of years (N) = Rs……..

Bidding capacity= {[AxNx1.5]-B} = Rs……..

Certificate: - I certify that all the awarded and ongoing works have been included in above list.

Signature of Chartered Account with Seal **Seal & Signature of Contractor**

FORM "D"

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORM 'C'

1. Name of Work / Project and Location:
2. Agreement No.
3. Estimated Cost:
4. Tendered Cost:
5. Date of start:
6. Date of completion
   (a) Stipulated date of completion:
   (b) Actual date of completion:
7. Total cost of completed as per Final Bill (Rs.):
8. Amount of compensation levied for delayed Completion, if any
   a) Whether case of levy of compensation for delay has been decided or not? : Yes /No
   b) If decided, amount of compensation leviedfor delayed completion, if any.
9. Amount of reduced rate items, if any:
10. Performance Report :
    (i) Quality of Work : Outstanding/ Very Good/ Good / Poor
    (ii) Financial Soundness : Outstanding/ Very Good/ Good / Poor
    (iii) Technical Proficiency : Outstanding/ Very Good/ Good / Poor
    (iv) Resource fullness : Outstanding/ Very Good/ Good / Poor
    (v) General behavior : Outstanding/ Very Good/ Good/ Poor

Dated: **Executive Engineer or Equivalent**

FORM 'D-2'

CERTIFICATE OF EXPERIENCE IN SUPPORT OF HAVING SUCCESSFULLY COMPLETED ONE WORK WITH THE STRUCTURAL SYSTEM TECHNOLOGY PROPOSED TO BE USED IN THE WORK

1. Name of work/project and location
2. Owner or sponsoring organization
3. Cost of work in crores of rupees
4. Date of commencement as per contract
5. Stipulated date of completion
6. Actual date of completion
7. Type of structural system Technology used
8. Litigation/arbitration cases Pending/in progress with details
9. Name and address/telephone number of officers to whom reference may be made
10. Whether the work was done on back-to-back basis (yes / no)

Certified that M/s..... has completed the above work with the structural system technology as per details mentioned above.

To be signed with date and seal of the owner /

Sponsoring organization

FORM 'E'

STRUCTURE AND ORGANISATION

1.	Name & Address of the Contractor		
2.	Telephone No. / Email id /Mobile No./Fax No.		
3.	Legal status of the Contractor (Attach copies of original document defining the legal status).		
	a)	An Individual	
	b)	A proprietary firm	
	c)	A firm in partnership	
	d)	A limited company or Corporation	
4.	Particulars of registration with various Government bodies (attach attested photo- copy).		
	ORGANIZATION/PLACE OF REGISTRATION		REGISTRATION No.
	1.		
	2.		
	3.		
5.	Names and Titles of Directors & Officers with designation to be concerned with this work.		
6.	Designation of individuals authorized to act for the organization.		
7.	Has the Contractor or any constituent partner in case of partnership firm limited company or Corporation ever abandoned the awarded work before its completion? If so, give name of the project and reasons for abandonment.		
8.	Has the Contractor, or any constituent partner in case of partnership/firm/ limited company or corporation ever been convicted by the court of law? If so, give details.		
9.	In which field of Civil Engineering Construction, the Contractorhas specialization and interest?		
10.	Any other information considered necessary but not included above.		

SIGNATURE (S) OF CONTRACTOR(S)

FORM-"F"
PROFORMA OF AFFIDAVIT FOR NON - BLACK LISTING

I/we undertake and confirm that our firm/partnership firm has not been blacklisted by any state/Central Departments/PSUs/Autonomous bodies/Nepal Government during the last 7 years of its operations. Further that, if such information comes to the notice of the IBC, then I/we shall be debarred for bidding in International Buddhist Confederation (IBC) in future forever. Also, if such information comes to the notice of department on any day before date of start of work, the PMC shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee (Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid).

NOTE: Affidavit to be furnished on a 'non-Judicial' stamp paper worth Rs. 100/-

Signature of Contractor(s) or an authorized Officer of the firmwith stamp

Signature of Notary with seal

Annexure-3

AFFIDAVIT FOR NON-EXECUTION OF WORKS ON BACK-TO-BACK BASIS

NAME OF WORK: "Construction of Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works at Lumbini, Nepal including Operation and Maintenance (O&M) for Two Years".

I/We undertake and confirm that eligible similar work(s) has / have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of IBC, then I/we shall be debarred for bidding in IBC in or if it is found that any information has been concealed, then I / we shall be debarred for tendering in IBC in future forever. Also, if such a violation comes to the notice of IBC before date of start of work, the PMC shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

NOTE: This Affidavit to be furnished on a 'non-judicial' stamp paper worth Rs.10/-

Date:

Place:

Signature of Contractor (s) or an authorizedOfficer of the firm with stamp & sealSignature of Notary with seal

Annexure-4

(Guarantee offered by Bank to IBC in connection with the execution of contracts)Form of Bank Guarantee for Earnest Money Deposit /Performance Guarantee/Security Deposit/Mobilization Advance

1. Whereas the Director …….. (Name) …….. on behalf of the International Buddhist Confederation (hereinafter called "Employer") has invited bids under..... (NIT number) ..... dated for..... (Name of work) …….. The IBC has further agreed to accept irrevocable BankGuarantee for Rs. ..... (Rupees .... only) valid up to ..... (date)*…….. as Earnest Money Deposit from..... (name and address of contractor) ..... (Hereinafter called "the contractor") for compliance of his obligations in accordancewith the terms and conditions of the said NIT.

OR

Whereas the Director …….. (name) ...., IBC on behalf of the International Buddhist Confederation (hereinafter called "The Employer") has entered into an agreement bearing number……with.....(name and address of the contractor) …… (hereinafter called "the Contractor") for execution of work.....(name of work) …… ……. The IBC has further agreed to accept an irrevocable Bank Guarantee for Rs…….. (Rupees …….. only) validup to ..... (date) as Performance Guarantee/security Deposit/Mobilization Advance from the said Contractor for compliance of his obligations in accordance with the terms and conditionsof the agreement.

2. We, ...(indicate the name of the bank) (herein after referred to as "the Bank"), Hereby undertake to pay to the IBC an amount not exceeding Rs… (Rupees …….. only) on demand by the IBC within 10 days of the demand.

3. We, ...(indicate the name of the Bank) do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the IBC stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. …….. (Rupees only).

4. We, ... (indicate the name of the Bank) ....., further undertake to pay the IBC any money so demanded notwithstanding any dispute or disputes raised bythe contractor in any suit or proceeding pending before any court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge of our liability for payment there under and the contractor shall have no claim against us for making such payment.

5. We, ... (indicate the name of the Bank) further agree that the IBC shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the IBC against the said contractor and to forbear or enforce any of the terms and conditions rerating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said contractor or for any forbearance, act of omission on the part of the IBC or any indulgence by the IBC to the said contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. We, ...(indicate the name of the Bank) further agree that the IBC at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the contractor and notwithstanding any security or other guarantee the IBC may have in relation to the Contractor's liabilities.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the contractor.

8. We, ...(indicate the name of the Bank) undertake not to revoke this guarantee except with the consent of the IBC in writing.

9. This Bank Guarantee shall be valid up to ……unless extended on demand by the IBC. Notwithstanding anything mentioned above, or liability against this guarantee is restricted to Rs…… (Rupees only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date ……..

Witnesses:

1. Signature……
   Name & Address

2. Signature……
   Name & Address

Authorized signatory Name
Designation Staff code no.Bank seal

Annexure- 5
Receipt for deposition of Original EMD
(Receipt No…….. / Date…..)

NAME OF WORK: "Construction of Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works at Lumbini, Nepal including Operation and Maintenance (O&M) for Two Years".

NIT NO.

1. **Estimated Cost** : **Rs. 100,00,00,000/-**
2. **Amount of Earnest Money Deposit** : **Rs. 10,00,000/-**
3. **Last date of submission of bid:** : **13:00 Hrs on 21/12/2022.**

---

1. Name of Contractor ..... #
2. Form of EMD ..... #
3. Amount of EMD Deposit .....#
4. Date of submission of EMD.....#

Signature of EMD receiving

OfficerName & Designation

Office Stamp

Note: EMD shall be in favour of Director, International Buddhist Confederation New Delhi.
To be filled in by EMD Receiving Officer

Annexure 6
INTEGRITY PACT

INTEGRITY PACT (Integrity Pact is applicable for all works of estimated cost put to tender equal to or more than the threshold value given in Schedule-F)

This Integrity Pact is made at ..... on this ..... day of ..... 20 ....

BETWEEN

Director represented by the IBC (hereinafter referred to as the principal, which expression shall unless repugnant to the meaning or context here of includeits successors and permitted assignees)

AND

.....

(Name and address of the Contractor)

(Hereinafter referred to as the Contractor/Contractor and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assignees)

Preamble

WHEREAS the Principal has floated the tender (NIT No .....) (Herein after referred to as the Tender) and intends to award, under laid down organizational procedure, contract for .... (Name of work)..... hereinafter referred to as the Contract.

AND WHEREAS the Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Contractor(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as Integrity Pact), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

In order to achieve these goals, the principal will appoint Independent External Monitors (IEMs) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned hereunder.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Integrity Pact witnesses as under:

Articles

Article 1: Commitment of the Principal

(1) The principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of the principal, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a

promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

(b) The Principal will, during the Tender process, treat all Contractor(s) with equity and reason. The Principal will, in particular, before and during the Tender process, provide to all Contractor(s) the same information and will not provide to any Contractor(s) confidential/ additional information through which the Contractor(s) could obtain an advantage in relation to the Tender process or the Contract execution.

(c) The Principal shall endeavour to exclude from the Tender process any person,whose conduct in the past has been of biased nature.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and inaddition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Contractor(s)/Contractor(s)

1. It is required that each Contractor/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercionor Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.

2. The Contractor(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:

(a) The Contractor(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.

(b) The Contractor(s)/Contractor(s) will not enter with other Contractor(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.

(c) The Contractor(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Contractor(s)/ Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including

information contained or transmitted electronically.

(d) The Contractor(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/ representatives in India, if any. Similarly, Contractor(s)/Contractor(s) of Indian nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

(e) The Contractor(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.

(f) Contractor(s) / Contractor(s) who have signed the Integrity Pact shall not approach the courts while representing the matter to IEMs and shall wait for their decision in the matter.

3. The Contractor(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

4. The Contractor(s)/Contractor(s) will not, directly or through any other person orfirm indulge in fraudulent practice, wilful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.

5. The Contractor(s)/Contractor(s) will not, directly or through any other person orfirm use coercive practices (which shall include the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property) to influence their participation in the tendering process.

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal under law or the contract or its established policies and laid down procedures, the Principal shall have the following rights in case of breach of this Integrity Pact by the Contractor(s)/Contractor(s) and the Contractor/ Contractor accepts and undertakes to respect and uphold the Principal absolute right:

1. If the Contractor(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal after giving 14 days notice to the contractor shall have powers to disqualify the

Contractor(s)/Contractor(s)

from the Tender process or terminate/determine the Contract, if already executed or exclude the Contractor/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal. Such exclusion may be forever or for a limited period as decided by the Principal.

2. **Forfeiture of Earnest Money Deposit/Performance Guarantee/Security Deposit:** If the Principal has disqualified the Contractor(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal apart from exercising any legal rights that may have accrued to the Principal, may in its considered opinion forfeit the entire amount of Earnest Money Deposit/Performance Guaranteeand Security Deposit of the Contractor/Contractor.

3. **Criminal Liability:** If the Principal obtains knowledge of conduct of a Contractor or Contractor, or of an employee or a representative or an associate of a Contractor or Contractor which constitutes corruption within the meaning of PC Act, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1. The Contractor declares that no previous transgressions occurred in the last 3 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the tender process.

2. If the Contractor makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken for banning of business dealings/holiday listing ofthe Contractor/Contractor as deemed fit by the principal.

3. If the Contractor/Contractor can prove that he has resorted/recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Contractors/Contractors/Subcontractors

1. The Contractor(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Contractor/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement by any of its Subcontractors/subvendors.

2. The Principal will enter into pacts on identical terms as this one with all Contractors and Contractors.

3. The Principal will disqualify Contractors who do not submit the duly signed Integrity Pact between the Principal and the Contractor along with the Tender or violate its provisions at any stage of the Tender process.

Article 6- Duration of the Pact

This Integrity Pact begins when both the parties have legally signed it. It expires for the Contractor 12 months after the completion of work under the contract or expiry of defect liability period or last payment made under the contract, whichever is later and for all other Contractors, 6 months after the Contract has been awarded.

If any claim is made/lodged during this time, the same shall be binding and continue to be valid despite the lapse of this Integrity Pact as specified above, unless it is discharged/determined by the PMC concerned.

Article 7- Other Provisions

1. This Integrity Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal, who has floated the tender.

2. Changes and supplements as well as termination notice need to be made in writing.

3. If the Contractor is a partnership or a consortium, this Integrity Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Integrity Pact must be signed by a representative duly authorized by board resolution.

4. Should one or several provisions of this Integrity Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intensions.

5. Issues like Warranty/Guarantee etc. shall be outside the purview of IEMs.

6. It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Pact, any action taken by the Principal in accordance with this Integrity Pact or interpretation thereof shall not be subject to arbitration.

7. In view of the nature of integrity pact, the Integrity Pact is irrevocable and shall remain valid even if the main tender/contract is terminated till the currency of the integrity pact.

8. If any complaint regarding violation of IP is received directly by the Principal in respect of the contract, the same shall be referred to the IEM for comments/recommendations.

Article 8 –Independent External Monitor (IEM)

(1) The Principal appoints competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission/competent authority in Nepal in this regard (Names and address of IEMs are as mentioned in Schedule-F). The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all contract documents, whenever required. It will be obligatory for him/her to treat the information and documents of the Contractors / Contractors as confidential.

(3) The Contractor(s)/Contractor(s) accepts that the IEM has the right to access without restriction to all project documentation of the Principal including that provided by the Contractor, The Contractor will also grant the IEM, upon his/her request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same is applicable to subcontractors.

(4) The IEM is under contractual obligation to treat the information and documents of the Contractor{s}/Contractor(s)/ Sub-contractor(s) with confidentiality. The IEM has also signed 'Non- DisclosureofConfidential Information' and 'Absence of Conflict of Interest'. In case if any conflict of interest arising at a later date, the IEM shall inform the PMC and recuse himself / herself from that case.

(5) As soon as the IEM notices, or believes to notice, a violation of this agreement, he/she will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right to demand from the partiesthat they act in a specific manner, refrain from action or tolerate action.

(6) The IEM will submit a written report to the PMC concerned within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

(7) If the IEM has reported to the PMC concerned, a substantiated suspicion of anoffence under relevant IPC/ PC Act, and the PMC concerned has, within a reasonable time, not taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the IEM may also transmit this information directly to the Central Vigilance Commissioner)

(8) The Principal will provide to the IEM sufficient information about all meetings among the parties related to the project provided such meetings could have impact on contractual relations between the Principal and the contractor. The parties will offer to the IEM the option to participate in such meetings.

(9) The word IEM or monitor would include both singular and plural.

Article 9- Legal and Prior Rights

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard to any of the provisions covered under this Integrity Pact.

IN WITNESS WHERE OF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....

(For and on behalf of Principal)

.....

(For and on behalf of Contractor/Contractor)

WITNESSES:
1 .....
(signature, name and address)

2 .....

(signature, name and address)

Place:

Dated:

Note: To be signed by the Contractor and Director IBC. Provision of IEMs IEMs (Independent External Monitors) have been appointed to monitor IP (Integrity pact) for works having estimated cost as mentioned in Schedule F. Details (names, address, number etc.) of IEMs are available in the Schedule F.

****

Part III
FINANCIAL BID

INTERNATIONAL BUDDHIST CONFEDERATION
(CPWD-8)
(Item Rate Tender & Contract for Works)

Tender for the work of: - "Construction of Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works including Operation and Maintenance (O&M) for Two Years at Lumbini, Nepal".

I) To be submitted (in Hard Copy) by 13:00 Hours on 22/12/2022

II) Tender to be opened in presence of tenderers who may be present after 12:00 hours on 23/12/2022 in the office the International Buddhist Confederation, A-1wing, 5th Floor, IGNCA Building, Janpath New Delhi-110001.

III) Tenders issued by IBC shall only be entertained.

Signature of the Contractor with seal

BOQ IS ANNEXED-EXCELSHEET SEPARATELY

Notes:-
The followings terms of payments is as follows:-

1.0 No mobilization/secured advance will be given.

2.0 Running Bills shall be raised once in 30 days and shall be subject to a minimum of INR. 25.00 Lakhs (Twenty-Five Lakhs) net payable amount after adjusting recoveries of Mobilization advances. Necessary Retention shall be made from all Running Bill payments.

3.0 Payment should be released within 21 days from the date of bill submission. Failing to make a payment within the time resulting the extension of the project accordingly. Same shall be consider in total project duration.

4.0 Any taxes and/or other Governmental levies as applicable or becoming applicable later due to or under any law shall be reimbursed extra as actual.

5.0 Exemptions of taxes by Government of Nepal;

5.1 **Exemptions** of payment of all custom duties taxes including VAT & CESS on any material or equipment imported from India by the executing agency

5.2 Refund of VAT and related taxes in respect of any material, equipment purchased or procured in Nepal in the Project. The executing agency shall submit the necessary request with VAT Bills to the Inland Revenue Office of Govt. of Nepal for reimbursement and Inland Revenue office of Govt. of Nepal will reimburse the paid VAT within the prescribed time, in accordance with the VAT act and regulations of Govt. of Nepal.

5.3 Double Tax avoidance agreement signed between the two countries on 18 January 1987 shall be applicable in the case of income tax for any Indian national or Indian firm employed by the

Govt. of India as a consultant or contractor in connection with the project.

5.4 Emphasis should be given that material for the project is manufactured in India OR Nepal. Nevertheless the special kind of material and equipment shall be imported from other countries, if required.

6.0 The "Bidder" shall provide a Performance Guarantee in the prescribed Performance of 3% of the tendered amount. The Performance Guarantee submitted by the "Bidder" shall be valid up to 60 days beyond the completion of work. In addition to this security deposit of 5% of the tendered amount shall be deducted from the bills

7.0 For the purpose of this tender document "Bidder", "Agency" and "Contractor" are synonymous.

8.0 The department shall have the right to withhold payment due to the contractor under this agreement in the event of any breach of the terms and conditions of the contract. The opinion of the Deputy Director, IBC New Delhi or his authorized representative on this aspect shall be final. No interest shall be allowed on payment withheld when released.

9.0 The payment will be released to the agency by the Director, IBC after obtaining the running/Final Bill.

10.0 For any delay in completion of the work other than by any exceptionally inclement weather, a penalty at 1% of tendered amount per month (Rs ….. per day) will be liable to the contractor. Provided that the total that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the tendered amount.

11.0 Bidder is required to accommodate PMC/ IBC for Third Party Inspection of Material, Equipment's, etc. prior to procurement of peculiar items. The expenditure incur during the inspection (Travel Tickets, Lodging, Boarding accommodation, Local Travel etc.), will be borne by bidder and the same will be reimbursed under the head Provisional Sum

12.0 Bidder shall provide the well-established (Furnished with completely Equipped) office at Site and arrange accommodation along with 2 no's of Vehicles (4-Wheeler-SUV not below 2020 Model with Diesel / Petrol and Driver) for the IBC/ Architect Consultant team / PMC during the complete tenure of the project

13.0 **Specific Services Requirement :**If any additional specific services of experts/ institutions are required for the project; th same will be arrange by the bidder and the same will be reimbursed under the head of Provisional Sum

14.0 **Price Variation:-**The quantity may increase or decrease. Also, there may be chance of variation w.r.t drawing and design attached, depending upon time and condition at the time of execution of work. The quantity/ items may be increased at the time of execution. The rate for the extra/ Excess item will be decided as per latest CPWD BSR. In case any item not found in latest CPWD BSR, than market rate analysis will be applicable. In above both cases tender premium (TP) will be applicable to bidder 10% (fixed) only on latest CPWD BSR / Market rate.

15.0 **PROVISIONAL SUM:-** The following task shall be reimbursed by the bidder under the head of Provision Sum;

1.0 Survey & Investigation:

2.0 Workshop/ Trainings

3.0 Third Party Inspection
4.0 Specific Services Requirement
5.0 Vetting of Drawings from NIT/IIT/Engineering Colleges
6.0 IBC/ Architect Consultant team / PMC Facility Requirements
7.0 Any other requirement during the course of project.

TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work "Construction of Building of India International Centre for Buddhist Heritage and Culture (IICBHC) includes Civil Works, Interior, Mechanical, Net zero, Electrical, Plumbing & all allied Works at Lumbini, Nepal including Operation and Maintenance (O&M) for Two Years."

I/We hereby tender for the execution of the work specified for the IBC within the time specified in Schedule 'F' viz., schedule of quantities and in accordancein all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and the Conditions of contract and with such materials as are provided for, by, and in respectof accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for **Seventy-Five (75)** days from the date of opening of technical bid and not to make any modification in its terms and conditions.

A sum of **Rs. 10,00,000/-** is hereby forwarded in Bankers cheque of commercial bank or Account payee Demand Draft of commercial bank or Fixed Deposit receipt (FDR) of commercial bank or insurance surety bonds as earnest money.

A copy of earnest money in receipt of Bankers cheque of commercial bank or Account payee Demand Draft of commercial bank or Fixed Deposit receipt (FDR) of commercial bank or insurance surety bonds, bank guarantee or e-bank guarantee of commercial bankissued by a scheduled bank is scanned and uploaded (strike out as the case may be). If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said Director IBC or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/ We agree that Director IBC or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tenderingprocess of the

work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in IBC in future forever. Also, if such a violation comes to the notice of Department beforedate of start of work, the PMC shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated: …… Signature of Contractor -……..

Witness: ……..

Address: …… Postal Address -……

Occupation: …… Email - ……..

(Blank space to be filled by Contractor)

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) isaccepted by me for and on behalf of the IBC for a sum of Rs. ……..

(Rupees

.....)

The letters referred to below shall form part of this contractagreement: -(a)

(d)

(e)

For & on behalf of the International Buddhist Confederation,

Signatures .....

Dated:

Designation .....

TECHNICAL SPECIFICATION & DRAWINGS

1. Please refer General Specifications for all Civil, Electrical, MEP, Horticulture works etc. as published by CPWD and same can be download from below link:

(i) For civil works: CPWD specifications 2019 Vol -I & II with up-to-date amendments (https://cpwd.gov.in/Publication/Specs2019V1.pdf &

(ii) https://cpwd.gov.in/Publication/Specs2019V2.pdf)

(ii) For Heating, Ventilation & Air-Conditioning (HVAC) – CPWD specifications 2004 with up-to-date amendments (Automatically generated PDF from existing images. (cpwd.gov.in)

& https://cpwd.gov.in/Publication/GenSpec_HVAC2004.pdf

& https://cpwd.gov.in/Publication/HVAC.pdf

(iii) For Electrical Works

(https://cpwd.gov.in/Documents/cpwd_publication.aspx)

(a) 9.2.1 Part-I Internal - 2005, 2013, 2013 (Amendments)

(b) 9.2.2 Part-III-Lift & Escalators - 2003

(c) 9.2.3 Part-IV Sub Station – 2013

(d) 9.2.4 Part V Wet Riser & Sprinkler Systems – 2020

(e) 9.2.5 Part VI Fire Detection and Alarm System – 2018

(f) 9.2.6 Part VII D.G. Sets - 2013

(g) 9.2.7 Part VIII Gas Based Fire Extinguishing System 2013 English, 2013 हिन्दी

(h) 9.3.1 CPWD General Specification for Medical Gas Pipe System 2022

(i) 9.3.2 CPWD General Specification for Pneumatic Tube Transport System 2022

(j) 9.3.3 CPWD General Specification for Modular operation Theater. 2022

(k) 9.3.4 CPWD General Specification for Nurse Call System 2022

(l) For Horticulture works : Schedule of Rates, Analysis of Rates and Specifications (Horticulture & Landscaping)- 2020 with up-to-date amendments (https://www.cpwd.gov.in/Publication/DSR_Horticulture_2020.pdf)

(https://cpwd.gov.in/Documents/cpwd_publication.aspx)

(ii) https://cpwd.gov.in/Documents/cpwd_publication.aspx

(iii) **Some Specific Specifications & Drawings are annexed along with. (Separately)**

(iv) All materials and their brands specified by Consultant Architect to be used in this project shall have to be mandatorily approved by the PMC.

Table-1
Equipment for testing of materials & concrete at site laboratory

1. Balances
   i) 7 to 10 kg capacity, semi self-indicating type-Accuracy 10 gms.
   ii) 500 gm. Capacity, semi self-indicating-Accuracy 1gm.
   iii) Pan Balance 5kg capacity- Accuracy 10gms.
   iv) Weighing scale platform type 100 kg capacity.
2. Oven- electrically operated thermostatically controlled upto 110 deg Celsius Sensitivity 1 deg Celsius. -1 no
3. Sieves as IS 460-1962
   i) IS Sieves-450mm internal dia. of size 100 mm, 80mm, 50mm, 40mm, 25mm, 20mm, 12.5mm, 10mm, 6.3mm, 4.75mm, complete with lid & pan
   ii) IS Sieves-200mm internal diameter (brass frame) consisting of 2.36mm, 1.18mm, 600 micron, 425 micron, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid & pan
4. Sieve shaker capable of 200mm and 450mm dia. sieves, manually operated with timing switch.
5. Equipment for slump test- Slump Cone, steel plate, tamping rod, scale & scoop
6. Dial Gauge 25mm travel-0.01mm/division least count – 2nos.
7. 100 Tonnes compression testing machine, Electrically Operated. - 1 no
8. Cube Molds 150x150x150 mm - 60 Nos.
9. Cube Molds 75x75x75 mm - 12 Nos.
10. Graduated measuring cylinders 250ml – 2 nos,500 ml capacity -3nos, 1000 ml- 1 No.
11. Aggregate impact test apparatus as per IS 2386 -Part IV-1963.
12. Modified proctor compaction apparatus – 1 no.
13. Sand pouring cylinder with control funnel and tube complete as per IS 2720- Part XXVIII- 1974.
14. Sampling tins with rods 100 mm dia. x 50 mm height, 0.5 Kg capacity and miscellaneous items like moisture tins etc.
15. Constant temperature bath for accommodating test specimen, electrically operated andthermostatically controlled.
16. Penetrometer with automatic time controller and with adjustable weight accessories and needles asper IS 1203- 1958.
17. Distant reading thermometers.
18. Moisture metre.
19. Enamel tray
20. Pumps and pressure gauges for hydraulic testing of pipes. – 1 no.
21. Ultrasonic pulse test equipment (for concrete NDT test) – 1 no – Minimum 5 % concrete RCC members shall be tested.

22. Digital PH meter least count 0.01 mm – 1 no.
23. Coating thickness testing guage (ferrous and non ferrous)- 1 no each.
24. Concrte mixer electrical/diseal operated for concrete mixing at site 0.25 cum- 1no.
25. Digital micrometer / screw guage least count -0.01 mm
26. Digital Rebound hammer- 1no
27. Any other equipment for site test as outlined in BIS codes, whenever required and as directed by E IN C.

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Table- 2

List of mandatory machinery, tools & plants to be deployed by the contractor at site

Sr. No.	Equipment	Numbers (Minimum)
1	Tower crane	As per requirement
2	Builders Hoist	As per requirement
3	Passenger lift	As per requirement
4	Excavator cum loader (JCB 3D model or equivalent).	3
5	Compressor machine minimum 200 cfm with rock breaker.	1
6	DG set of minimum capacity 160 KVA.	2
7	Batching plant with 30 Cum/ Hour capacity	1
8	Transit mixer.	4
9	Concrete pump	2
10	Needle Vibrators.	10
11	Plate Vibrators.	3
12	Dumper.	4
13	Reinforcement bending machine.	2
14	Reinforcement cutting machine.	2
15	Power driven earth rammer (Soil compactor).	1
16	Total station and level taking machine	1 each
17	Water tanker (minimum capacity 5000 liter)	As per requirement
18	Welding machine 400 Ampere	2
19	Road Roller 8 to 10 Tonne	1
20	Vibratory Roller	1
21	Paver Finisher Hydrostatic with Sensor control	As per requirement
22	Truck/ Tipper/Tractor with trolley	As per requirement
23	Road Sweeper	As per requirement
24	Coal tar Sprayer	As per requirement
25	Aluminium Formwork Shuttering **Note: - Recovery at the rate of Rs 7500/ sqm shall be made fornon-procurement of Aluminium form work shuttering in required quantity**.	As required for achieving milestone
26	Shuttering with necessary props	As required for achieving milestone

27	Double Steel Scaffolding and staging material	As required for achieving milestone
28	Any other machinery required for completion of the work as per decision of PMC.	As per actual requirement

Note:

1. The above list is only indicative and not exhaustive. The contractor may require to deploy more T & asper requirement.
2. The above T & P shall be available at appropriate stage. However, the decision of Engineer in charge inthis regard shall final and binding.

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ADDITIONAL, SPECIAL CONDITIONS & PARTICULAR SPECIFICATIONS

ADDITIONAL CONDITIONS

1. GENERAL

1.1. The Contractors are advised to inspect and examine the site and its surroundings and satisfy themselves with the nature of site, the means of access to the site, constraints put by local regulations, if any, weather conditions at site, general ground / subsoil conditions etc. or any other circumstances which may affect or influence their tenders. The Contractor shall carryout survey of the work area, at his own cost, setting out the layout and fixing of alignment of the building as per architectural and Structural drawings in consultation with the Engineer-in- Charge. Any discrepancy between the architectural drawings and actual layout at site shall be brought to the notice of the PMC. It shall be responsibility of the Contractor to ensure correct setting of alignment. Nothing extra shall be payable on this account. No claims, whatsoever, shall be entertained at alater date for any errors found, on plea that the information supplied by the Department inthe tender is insufficient or is at variance with the actual site conditions.

1.2. The Contractor shall, if required by him, before submission of the tender, inspect the drawings in the Office of the PMC. IBC shall not bear any responsibility for the lack of knowledge and also the consequences, thereof to the Contractor. The information and data shown in the drawings and mentioned in the tender documents have been furnished, in good faith, for general information and guidance only. The PMC, in no case, shall be held responsible for the accuracy thereof and/or interpretations or conclusions drawn there from by the Contractor and all consequences shall be borne by the Contractor. No claim, whatsoever, shall be entertained from the Contractor, if the data or information furnished in tender document is different or in-correct otherwise or actual working drawings are at variance with the drawings available for inspection or attached to the tender documents. .

1.3. It is presumed that the Contractor shall satisfy himself for all possible contingencies, incidental charges, wastages, bottlenecks etc. likely during execution of work and acts of coordination, which may be required between different agencies. Nothing extra shall be payable on this account.

1.4. Sub-soil investigation report of a site near to the work site is available in the office of PMC Interested Contractors can go through the report if required for their guidance. However, the Contractor is advised to obtain requisite details directly as may be considered necessary by him before quoting rates in the tender. No claim whatsoever on account of any discrepancy between the sub-surface strata conditions that maybe actually encountered at the time of execution of the work andthose available in the report shall not be entertained under any circumstances. The ground water table is a variable condition and the information given in the report is only indicative and it may vary from time to time.

1.5. The nomenclature of the item given in the schedule of quantities gives in general the work content but is not exhaustive i.e. does not mention all the incidental works required to be carried out for complete execution of the item of work. The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/or described in the specifications, provided that the same can be reasonably inferred. There may be several incidental works, which are not mentioned in the nomenclature of each item but will be necessary to complete the item in all respects. All these incidental

works / costs which are not mentioned in item nomenclature but are necessary to complete the item shall be deemed to have been included in the rates quoted by the contractor for various items in the schedule of quantities. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation / change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to theitems of work and are necessary to complete such items in all respects) on account of the directions of PMC. Nothing extra shall be payable on this account.

1.6. The contractor(s) shall give to the local body, police and other authorities all necessary notices etc. that may be required by law and obtain all requisite licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be leviable on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night.

1.7. The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night. In case of any accident of labours/ contractual staff the entire responsibility will rest on the part of the contractor and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor.

1.8. The work shall generally be carried out in accordance with the "CPWD Specifications 2021 Vol. I & II" with up-to-date correction slips, additional/Particular Specifications, architectural/Structural drawings and as per instructions of PMC. Any additional item of the work, if taken up subsequently, shall also confirm to the CPWD/other relevant specifications as mentioned above.

1.9. Several documents forming the tender are to be taken as mutually complementary to one another. Detailed drawings shall be followed in preference to small scale drawings and figured dimensions in preference to scale dimensions.

1.10. There be any difference or discrepancy between the description of items as given in the schedule of quantities, particular specifications for individual items of work (including special conditions) and I.S. Codes etc., the following order of preference shall be observed.

(i) Description of items as given in Schedule of quantities
(ii) Particular specifications
(iii) Special conditions
(iv) Additional Conditions
(v) CPWD Specifications including correction slips issued up to the last date of uploading/submission of tender.
(vi) General Conditions of Contract for CPWD works including correction slips issued up to the last date of uploading/submission of tender.
(vii) Indian Standards Specifications of B.I.S.
(viii) Decision of PMC.

1.11. The works to be governed by this contract shall cover delivery and transportation up to destination, safe custody at site, insurance, erection, testing and commissioning of the entire works.

1.12. The works to be undertaken by the contractor shall inter-alia include the following:

(i) Preparation of detailed SHOP drawings for any item, if demanded by Engineer in chargeand AS BUILT drawings wherever applicable.

(ii) If contractor does not submit the shop drawing within 7 days of intimation, then **penalty of Rs 1000/-** per day shall be imposed.

(iii) Obtaining of Statutory permissions where-ever applicable and required.

(iv) Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.

(v) Warranty obligation for the equipments and / or fittings/fixtures supplied by the contractor. Contractor shall provide all the shop drawings or layout drawings for all the co-ordinate services before starting any work or placing any order of any of the services etc. These shop drawings/layout drawings shall be got approved from Engineer-in- charge before implementation and this shall be binding on the contractor. The contractor shall submit material submittals along with material sample for approval of PMC prior to delivery of material at site.

1.13. The work shall be carried out in accordance with the approved architectural drawings, structural drawings, services drawings to be issued from time to time, by the PMC. Before commencement of any item of work the contractor shall correlate all the relevant architectural and structural drawings, nomenclature of items and specifications etc. issued for the work and satisfy himself that the information available from there is complete and unambiguous. The figure and written dimension of the drawings shall be superseding the measurement by scale. The discrepancy, if any, shall be brought to the notice of the PMC before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and or incomplete information and no claim whatsoever shall be entertained by the department on this account.

1.14. The Contractor(s) shall take instructions from the PMC regarding collectionand stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed. The stacking shall take place as per stacking plan however, if any change is required, the same shallbe done with the approval of PMC.

1.15. The Contractor shall bear all incidental charges for cartage, storage and safe custody of materials, if any, issued by department as well as to those materials also arranged by the contractor.

1.16. Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been built in the items and nothing extra shall be payable or extra cement considered in consumption on this account.

1.17. The contractor shall give performance test of the entire installation(s) as per the specifications in the presence of the PMC or his authorized representative before the work is finally accepted and nothing extra what-so-ever shall be payable to the contractor for such test.

1.18. PREVENTION OF NUISANCE AND POLUTION CONTROL

The contractor shall take all necessary precautions to prevent any nuisance or inconvenienceto the owners, tenants or occupiers of adjacent properties and to the public in general and to prevent any damage to such properties from pollutants like smoke, dust, noise. The contractor shall use such methodology and equipment so as to cause minimum environmental pollution of any kind and minimum hindrance to road users and to occupants of the adjacent properties or other services running adjacent/near vicinity. The contractor shall make good at his cost and to the satisfaction of the PMC, any damage to roads, paths, cross drainage works or public or private property whatsoever caused due to the execution of the work or by traffic brought thereon by the contractor. All waste or superfluous materials shall be carried away by the contractor, without any reservation, entirely to the satisfaction of the PMC.

1.19. SECURITY AND TRAFFIC ARRANGEMENTS

In the event of any restrictions being imposed by the Security agency, PMC, Traffic or any other authority having jurisdiction in the area on the working or movement of labour /Material, the contractor shall strictly follow such restrictions and nothing extra shall be payable to the contractor on such accounts. The loss of time on these accounts, if any, shall have to be made up by augmenting additional resources whatever required.

1.20. No payment shall be made for any damage caused by rain, snowfall, flood or any other natural calamity, whatsoever during the execution of the work. The contractor shall be fully responsible for any damage to the govt. property and the work for which paymenthas been advanced to him under the contract and he shall make good the same at his risk and cost. The contractor shall be fully responsible for safety and security of his material, T&P/Machinery brought to the site by him.

1.21. The contractor shall construct suitable godowns, yard at the site of work for storing all other materials so as to be safe against damage by sun, rain, damages, fire, theft etc. at his own cost and also employ necessary watch and ward establishment for the purpose at his cost.

1.22. All materials obtained from contractor shall be got checked by the representative of PMC on receipt of the same at site before use.

1.23. The contractor shall be responsible for the watch and ward/guard of the buildings, safety of all fittings and fixtures including all equipments, services provided by him against pilferage and breakage during the period of Installations and thereafter till the building is physically handed over to the IITB, the Client Department. No extra payment shall be made on this account and no claim shall be admissible on this account.

1.24. The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by LUMBINI DEVELOPMENT TRUST (LDT) shall be adhered to, by the contractor, during the execution of work. The Contractor shall also adhere to all traffic restrictions notifiedby the local authorities. The water charges (for LDT water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for the drinking purposes from the LDT or any other

statutory body, the consequent sewerage charges shall be borne by the contractor. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges) payable to such authorities for carrying out the work, shall be borne by the Contractor. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the Department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts. The fee payable to statutory authorities for obtaining the various permanent service connections and Occupancy Certificate for the building shall be borne by the Department.

1.25. For works below ground level the contractor shall keep that area free from water. If de-watering or bailing out of water is required the contractor shall do the same at his own cost and nothing extra shall be paid.

1.26. The Contractor shall make all necessary arrangements for protecting from rains, fog or likewise extreme weather conditions, the work already executed and for carrying out further work, during monsoon including providing and fixing temporary shelters, protections etc. Nothing extra shall be payable on this account and also no claims for hindrance shall be entertained on this account.

1.27. In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained notwithstanding any other provisions elsewhere in the contract agreement. Also, the Contractor shall make good, at his own cost, the damages caused, if any. Further, no claims for hindrance shall be entertained on this account.

1.28. The contractor will take reasonable precautions to prevent his workman and employees from removing and damaging any flora (tree/plant/vegetation) from the project area.

1.29. Setting out

1.29.1. The Contractor shall carry out survey of the work area, at his own cost, setting out the layout of buildings/ roads/ services in consultation with the PMC & proceed further. Any discrepancy between architectural drawings and actual layout at site shall be brought to the notice of the Engineer -in-charge. It shall be responsibility of the Contractor to ensure correct setting out of alignment. Total station survey instruments only shall be used for layout, fixing boundaries, and centre lines, etc., Nothing extra shall be payable on this account.

1.29.2. The Contractor shall establish, maintain and assume responsibility for grades, lines, levels and benchmarks. He shall report any errors or inconsistencies regarding grades, lines, levels, dimensions etc. to the PMC before commencing work. Commencement of work shall be regarded as the Contractor's acceptance of such grades, lines, levels, and dimensions and no claim shall be entertained at a later date for any errorsfound.

1.29.3. If at any time, any error appears due to grades, lines, levels and benchmarks during the progress of the work, the Contractor shall, at his own expense rectify such error, if so required, to the satisfaction of the Engineer -in-Charge. Nothing extra shall be payableon this account.

1.29.4. The Contractor shall protect and maintain temporary/ permanent benchmarks at the site of work throughout the execution of work. These benchmarks shall be got checked by the PMC or his authorized representatives. The work at different stages shall be checked with reference to bench marks maintained for the said purpose. Nothing extra shall be payable on this account.

1.29.5. The approval by the PMC, of the setting out by the Contractor, shall not relieve the Contractor of any of his responsibilities and obligation to rectify the errors/ defects, if any, which may be found at any stage during the progress of the work or after the completion of the work.

1.29.6. The Contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignments, the level and correctness of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the Contractor at his own cost to the entire satisfaction of the PMC.

1.29.7. The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work (including marking of reference points, center lines of buildings), construction and maintenance of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, barricading, signage, labour safety, labour welfare and labour training measures, preparatory works, working during monsoon, working at all depths, height and location etc. and any other incidental works required to complete this work. Nothing extra shall be payable on this account.

1.30. A site laboratory with the minimum equipments as specified in CPWD specifications/in this agreement shall be established, made functional and maintained within one month from the award of work as per **clause 10A of schedule A to F** without any extra cost to the department**. In case of non compliance / delay in compliance (To be set up within maximum 2 months from date of start) in this, a recovery @ Rs. 500/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.**

1.31. TOOLS AND PLANTS

The Contractor should have own constructions equipment required for the proper and timely execution of the work. Nothing extra shall be paid on this account.

No tools and plants including any special T&P etc. shall be supplied by the Department and the Contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.

1.32. SCAFFOLDING

Wherever required for the execution of work, all the scaffolding shall be provided and suitably fixed, by the Contractor. It shall be provided strictly with steel double scaffolding system, suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection. It shall be designed to take all incidental loads. It should cater to the safety features for workmen. Nothing extra shall be payable on this account. It shall be ensured that no damage is caused to any structure due to the scaffolding.

1.33. The Contractor shall do proper sequencing of the various activities by suitably staggering

the activities within various pockets in the plot so as to achieve early completion. The agency to deploy adequate equipment, machinery and labour as required for the completion of the entire work within the stipulated period specified. Also, ancillary facilities shall be provided by contractor commensurate with requirement to complete the entire work within the stipulated period. Nothing extra shall be payable on this account. Adequate number/sets of equipment in working condition, along with adequate stand-by arrangements, shall be deployed during entire construction period. It shall be ensured by the Contractor that all the equipment, Tools & Plants, machineries etc. provided by him are maintained in proper working conditions at all times during the progress of the work and till the completion of the work. Further, all the constructional tools, plants, equipment and machineries provided by the Contractor, on site ofwork or his workshop for this work, shall be exclusively used in the construction of this work and they shall not be shifted/ removed from site without the permission of the PMC.

1.34. The Contractor shall maintain all the work in good condition till the completion of entire work. The Contractor shall be responsible for and shall make good, all damages and repairs, rendered necessary due to fire, rain, traffic, floods or any other causes. The PMC shall not be responsible for any claims for injuries to person/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the Contractor or of any other of his representatives, in his employment during the execution of the work. The compensation, if any, shall be paid directly to the Department / authority / persons concerned, by the Contractor at his own cost.

1.35. ROYALTY

Royalty at the prevalent rates shall be paid by the Contractor or the RMC supplier as per the terms of supply between them, on all materials such as boulders, metals, all sizes stone aggregates, brick aggregates, coarse and fine sand, moorum, earth, river sand, gravels and bajri etc. collected by him for the execution of the work, directly to the revenue authority of the state government concerned. Further, contractor needs to submit proof of submission of full royalty to the state government or local authority. Nothing extra shall bepayable on this account.

1.36. PRESERVATION AND CONSERVATION MEASURES

1.36.1. Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services, if any, encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. In case the same are to be removed and diverted, expenditure incurred in doing so shall be payable to the contractor.The contractor shall work out the cost, get the same approved by PMC before taking up actual execution. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

1.36.2. All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on project location during excavation/construction shall be the property of the Government, and shall be dealt with

as per provisions of the relevant legislation. The contractor will take reasonable precaution to prevent his work men or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaint the PMC of such discovery and carry out the official instructionsof PMC for dealing with the same, till then all work shall be carried out in a way so as not to disturb/damage such article or thing.

1.37. RESPONSIBILITY

1.37.1. He shall protect and indemnify the Department (IBC) and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts.

1.37.2. The Contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the Department from any and all damages and claims that may arise on any account. The Contractor shall indemnify the Department against all claims in respect of patent rights, royalties, design, trademarks- of name or other protected rights, damages to adjacent buildings, roads or members of public, in course of execution of work or any other reasons whatsoever, and shall himself defend all actions arising from such claims and shall indemnify the Department in all respect from such actions, costs and expenses. Nothing extra shall be payable on this account.

1.37.3. The entire work up to the plinth level, as required for obtaining approval of the plinth from the local authority, shall be completed by the Contractor at the same time. Work above plinth shall be allowed to be carried out only after obtaining plinth approval from the local body. The contractor shall submit the application to local body and shall carry laisioning work with local body at his cost. No delay shall be allowed on this ground and also no claim whatsoever on account of any delay in approval at plinth level by the local body shall be entertained from the Contractor. Nothing extra shall be payable on this account. However statutory charges, if payable shall be paid by department.

1.37.4. On completion of work, the contractor shall submit required sets of “as built” drawings to the PMC furnishing requisite information for obtaining various service connections.

1.38. CO-OPERATION WITH OTHER CONTRACTORS/SPECIALIZED AGENCIES/ ASSOCIATE CONTRACTORS

1.38.1. The Contractor shall take all precautions to abide by the environmental relatedrestrictions imposed by any statutory body having jurisdiction in the area as well asprevent any pollution of streams, ravines, river bed and waterways. All waste or superfluous materials shall be transported by the Contractor, entirely to the satisfaction ofthe PMC and disposed at designated places only. No claim what so ever on account of site constraints mentioned above or any other site constraints, lack of public transport, inadequate availability of skilled, semi-skilled or unskilled workers in the near vicinity, non-availability of construction machinery spare parts and any other constraints not specifically stated here, shall be entertained from the Contractor. Therefore, the Tenderers are advised to visit site and get first-hand information of site constraints. Accordingly, they should quote their tenders. Nothing extra shall be payable on this account.

1.38.2. The Contractor shall cooperate with and provide the facilities to the associate Contractors and other agencies working at site for smooth execution of the work. The contractor shall indemnify the PMC against any claim(s) arising out of such disputes. The Contractor shall:

(a) Allow use of scaffolding, toilets, sheds etc.
(b) Properly co-ordinate their work with the work of other Contractors.
(c) Provide control lines and benchmarks to his associate Contractors and the other Contractors.
(d) Provide electricity and water at mutually agreed rates.
(e) Provide hoist and crane facilities for lifting material at mutually agreed rates.
(f) Co-ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.
(g) Adjust work schedule and site activities in consultation with the PMC and other Contractors to suit the overall schedule completion.
(h) Resolve the disputes with other Contractors/ associate contractors amicably and the PMC shall not be made intermediary or arbitrator.

1.38.3. The work should be planned in a systematic manner so as to ensure proper co-ordination of various disciplines viz. sanitary & water supply, drainage, rain water harvesting, electrical, firefighting & fire alarm system, information technology, communication & electronics and any other services.

1.39. SUPERVISION OF WORK

The Contractor shall depute Site Engineer & skilled workers as required for the work. He shall submit organization chart along with details of Engineers and supervisory staff. It shall be ensured that all decision-making powers shall be available to the representatives of the Contractor at Lumbini itself to avoid any likely delays on this account. The Contractor shall also furnish list of persons for specialized works to be executed for various items of work. The Contractor shall identify and deploy key persons having qualifications and experience in the similar and other major works, as per the field of their expertise. If during the course of execution of work, the PMC is of theopinion that the deployed staff is not sufficient or not well experienced, the Contractor shall deploy more staff or better- experienced staff at site to complete the work with quality and in stipulated time limit. Principle Technical representative of the Contractor having minimum fifteen years of experience in similar nature of work as mentioned in the clause 36 of the General Conditions of the Contract, shall always be available at the site during the actual execution of the work.

1.40. Specialized Agencies

(i) The contractor has to engage one of the approved agencies as mentioned in the list of specialized work. The main contractor shall not change the specialized agency. However, if the change is warranted, he may do so, with permission of PMC. Nothing extra shall be payable on this account.

(ii) It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main contractor shall be solely responsible for settling any

dispute / litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies. No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim whatso ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection/rejection of the Specialized Agencies or any dispute amongst them.

1.41. QUALITY ASSURANCE & TESTING OF MATERIALS

i. All material to be used in the work shall bear ISI certification mark unless otherwise the make is specified in the SOQ, list of approved makes and other conditions / specifications, appended with this tender document. In case ISI mark materials or the materials mentioned in the tender documents are not available, the material to be used shall conform to CPWD specifications applicable to this tender and / or national / international codes as approved by PMC. In such cases, the PMC shall satisfy himself about the quality of such materials and give his approval in writing. Only articles classified, as first quality bythe manufacturers / suppliers shall be used in the work, unless otherwise specified. All materials not having ISI mark, if allowed to be used in the work by PMC, shall be tested as per relevant specifications, as approved by the PMC. In all cases of use of ISI marked materials, proper proof of procurement of materials from authentic manufacturers shall be provided by the Contractor to the entire satisfaction of Engineer in charge.

ii. The Contractor shall make available, on request from the Department, the copies of challan, cash memos, receipts and other certificates, if any, vouchers towards the quantity and quality of various materials procured for the work and the same shall be kept in record. The Contractor shall also provide information and necessary documentation on the name of the manufacturer, manufacturer's product identification, manufacturer's instructions, warning, date of manufacturing and test certificates (from manufacturers for the product for each consignment delivered at site), shelf life, if any etc., for the department to ensure that the material have been procured from the approved source and is of the approved quality, as directed by the PMC. Wherever specified, day-to-day account of receipt of such material shall be maintained at site of work and shall be regulated by the department.

iii. The contractor has to establish field laboratory at site including all necessary equipment for field tests as given in Schedule 'F'. All the relevant and applicable standards and specifications shall be made available by the contractor at his cost in the field laboratory. The contractor shall designate one of his technical representatives as Quality Assurance Engineer, who shall be responsible for carrying out all mandatory filed/ laboratory tests. The contractor shall also provide adequate supporting staff at his cost for carrying out field tests, packaging & forwarding of samples for outside laboratory tests and for maintaining test records. All the registers of tests carried out atsite or in outside laboratories shallbe maintained by the contractor. The test register shall be issued to the contractor by the PMC. All the entries in the test register will be made by the designated engineer of the contractor and same shall be regularly reviewed by the PMC or his authorized representatives at site.

iv. The Contractor shall submit, immediately after the award of work, a detailed and

complete 'Method Statement' for the execution, testing and Quality Assurance, of such items of works, as directed by the PMC. All the materials to be used in the work shall comply with the requirements of the specifications and shall pass all the tests required as per specifications as applicable or such specifications / standards as directed by the PMC.

v. The Contractor shall procure and provide all the materials from the manufacturers /suppliers as per the list attached with the tender documents, as per the item description and particular specifications for the work. The equivalent brand for any item shall be permitted to be used in the work, only when the specified make is not available. This is, however, subject to documentary evidence produced by the contactor regarding non availability of the specified brand and also subject to independent verification by the PMC. In exceptional cases, wheresuch approval is required, the decision of PMC as regards equivalent make of the material shall be final and binding on the Contractor. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Nothing extra shall be payable on this account. Also, the material shall be procured only after written approval of the PMC.

vi. All materials whether obtained from Govt. stores or otherwise shall be got checked by the PMC or his authorized supervisory staff on receipt of thesame at sitebefore use.

vii. The Contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case he or his authorized representative is not present or does not associate him, the result of such tests and consequences thereon shall be binding on the Contractor. The Contractor or his authorized representative shall remain in contact with the Engineer-in–Charge or his authorized representative associated for all such operations. No claim of payment or claim of any other kind, whatsoever, shall be entertained from the Contractor.

viii. All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions before covering.

ix. Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to byelaws and LDT / corporation. The contractor should engage licensed plumbers for the work and get the materials (fixtures/fittings) tested by the PMC/LDT wherever required at his own cost.

x. The frequency of testing shall be carried out as per CPWD specification. The testing charges shall be borne by the Contractor. In case test is not mentioned in mandatory test in CPWD specification and PMC directs to carry out the test, in order to satisfy himself for quality of item used, then also the testing charges shall be borne by the Contractor.

1.42. Program Chart:

The Contractor shall prepare an integrated program chart within fifteen days of issue of award letter including civil as well as E & M activities for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower,

equipment and machinery required for the fulfillment of the program within the stipulated period and submit the same for approval of the PMC. These shall be submitted by the contractor through electronic media besides forwarding hard copies of the same. The integrated program chart so submitted should not have any discrepancy with the physical milestones attached in the contract agreement. The program chart should include the following: -

(i) Descriptive note explaining sequence of various activities.

(ii) Construction Program prepared on PRIMAVERA/ MS Project Software, which will indicate resources in financial terms, manpower and specialized equipment for every important stage.

(iii) Program for procurement of materials by the contractor.

(iv) Program for arranging and deployment of manpower both skilled and unskilled so as to achieve targeted progress.

(vi) Program of procurement of machinery/equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.

(vii) In case of non compliance/delay in compliance in this, a penalty @ Rs. 500/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

(viii) If at any time, it appears to the PMC that the actual progress of work does not conform to the approved program referred above, the contractor shall produce a revised program showing the modifications to the approved program by additional inputs to ensure completion of the work within the stipulated time.

(ix) The submission for approval by the PMC of such program or the furnishing of such particulars shall not relieve the contractor of any of his dutiesor responsibilities under the contract. This is without prejudice to the right of PMC to take action against the contractor as per terms and conditions of the agreement.

(x) Apart from the above integrated program chart, the contractor shall be required to submit fortnightly progress report of the work in a computerized form on 1st and 16th of every month. The progress report shall contain the following, apart from whatever else may be required as specified above:

(a) Construction schedule of the various components of the work through a bar chart for the next two fortnights (or as may be specified), showing the micro-milestone/milestones, targeted tasks (including material and labour requirement) and up to date progress. At least 10 digital photographs showing all the parts of construction site in soft copy has to be submitted in every fortnightly progress report.

(b) Progress chart of the various components of the work that are plannedand achieved, for the fortnight as well as cumulative up to the fortnight under reckoning, with reason for deviations, if any in a tabular format.

(c) Plant and machinery statement, indicating those deployed in the work

(xi) In case of non compliance / delay in compliance in submission of fortnightly, a penalty @ Rs. 1000/- per fortnightly report will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

(xii) The Department shall in no way be responsible for either any delay in getting electric and/or water and/or telephone connections for carrying out the work or not getting connections at all. No claim of delay or any other kind, whatsoever, on this account shall beentertained from the Contractor. Also, contingency arrangement of stand-by water & electric supply shall be made by the Contractor for commencement and smooth progress ofthe work so that work does not suffer on account of power failure or disconnection or not getting connection at all. No claim of any kind whatsoever shall be entertained on this account from the Contractor. Nothing extra shall be payable onthis account.

1.43. CLEANLINESS OF SITE

i) The Contractor shall not stack building material/malba/muck on the land or road of the institute or on the land owned by the others, as the case may be. So the muck, rubbish etc. shall be removed periodically as directed by the PMC, from the site of work to the approved dumping grounds as per the local bye laws and regulations of the concerned authorities and all necessary permissions in this regard from the local bodies shall be obtained by the Contractor. Nothing extra shall be payable on this account. In case, the Contractor is found stacking the building material/malba as stated above, the Contractor shall be liable to pay the stacking charges/penalty as may be levied by the local body or any other authority and also to face penal action as per the rules, regulations and bye-laws of such bodyor authority. The Engineer – in-Charge shallbe at liberty to recover, such sums due but not paid to the concerned authorities on the above accounts, from any sums due to the Contractor including amount of the Security Deposit and performance guarantee in respect of this contract agreement.

ii) The contractor shall take instructions from the PMC regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed.

iii) The Contractor shall take all care to prevent any water- logging at site. The waste water, slush etc. shall not be allowed to be collected at site. For discharge intopublic drainage system, necessary permission shall be obtained from relevant authorities after paying the necessary charges, if any, directly to the authorities. Thework shall be carried out in such a way that the area is kept clean and tidy. Allthe fees/charges in this regard shall be borne by the Contractor. Nothing extra shall be payable on this account.

1.44. INSPECTION OF WORK

i) Officers of IBC, Architect and cultural ministry & shall be inspecting the on-going work at site at any time with or without prior intimation. The contractor shall, therefore, keep updated the following requirements and detailing.

a) Display Board showing detail of work, weekly progress achieved with respect to targets, reason of shortfall, status of manpower, wages being paid for different

categories of workers.

b) Entrance and area surrounding to be kept cleaned.
c) Display layout plan key plan, building drawings including plans, elevations and sections.
d) Upto date displays of Bar chart, CPM and PERT etc.
e) Keep details of quantities executed, balance quantities, deviations, possibleExtra item, substituted Item etc.
f) Keep plastic / cloth mounted one sets of building drawings.
g) Set of Helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.

1.45. FINAL TESTING OF THE INSTALLATION AND HANDING OVER

a) The Contractor shall demonstrate trouble free functioning of all the Civil and E & M installations and services. The PMC or his authorized representatives shall carry out final inspection of the various Civil and E & M services and installations. Any defect(s) noticed during demonstration shall be rectified by the Contractor at his own cost to the entire satisfaction of the PMC. Nothing extra shall be payable on this account.
b) The contractor shall handover the building to IBC/PMC by performing deep cleaning of all buildings area, façade etc. by deploying the specialized agency. The buildinghanded over shall be free from stains, paint splashes, etc. Nothing extra shall be payable on this account.
c) The contractor shall submit as built drawing for plumbing, rainwater harvesting, stormwater, sewer line drain, MEP services and any other drawings asked by the E IN C during the completion. The agency shall submit standardized measurement book for each block for various items directed by E IN C. Penalty @ 0.1% (as described in Schedule F) shall be imposed for non-submission of said works.

1.46. DEFECT LIABILITY PERIOD (REFUND OF SECURITY DEPOSIT)

The clause 17 of the General Conditions of Contract CPWD works shall be applied.
The defect liability period shall start after the date of issue of completion certificate and it will be of two years. Besides observing other formalities prescribed in the General Conditions of the Contract, for release of security deposit, the contractor shall have to produce a certificate stating that no defects are pending for rectification from the competent authority of IBC.

1.47. DEALING WITH INCONSISTENT RATES

i) The Contractors shall quote same rates for the identical items which may inadvertently appear in more than one place. If different rates are quoted by the tenderers for such identical items, the same shall be rationalized by considering the lowest quoted rate for such items, for evaluation and acceptance of tender.
ii) Wherever any reference to any Indian Standards occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued thereto or revisions thereof, if any, up to the date of receipt of tenders.
iii) Unless otherwise specified in the schedule of quantities, the rates for all items of work shall be considered, as inclusive of pumping out or bailing out water, if required throughout the construction period for which no extra payment shall be made. This shall also include water encountered from any sources such as rains,

floods, sub soil water table being high and/or due to any other cause whatsoever.

iv) The rates for all items of work, shall unless clearly specified otherwise, include cost of all operations and all inputs of labour, material, T & P, scaffolding, wastages, watch and ward, other inputs, all incidental charges, all taxes, cess, VAT, duties, levies etc. required for execution of the work.

v) Unless otherwise provided in the Schedule of Quantities, the rates quoted by the Contractor for the various items shall be inclusive of carrying out the works at and / or up to all heights, lifts, leads and depths.

vi) Unless otherwise specified in the Schedule of Quantities, the rates quoted by the Contractor for the various items shall be inclusive of carrying out the work in curvilinear portions of the building in plan and elevation as per the architectural drawings. Nothing extra shall be payable on this account.

1.48. INSURANCE POLICIES

(i) Before commencing the execution of work, the Contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property, atsite of work. The Contractor shall obtain and submit to the PMC proper Contractor All Risk Insurance Policy for an amount **1.25 times** the contract amount for this work, with PMC as the first beneficiary. The insurance shall be obtained in joint names of PMC and the Contractor (who shall be second beneficiary). Also, he shall indemnify theDepartment from any liability during the execution of the work. Further, he shall obtain and submit to the PMC, a third-party insurance policy for maximum Rs.10 lakh for each accident, with the PMC as the first beneficiary. The insurance shall be obtained in joint names of PMC and the Contractor (who shall be second beneficiary).

(ii) The Contractor shall, from time to time, provide documentary evidence as regards payment of premium for all the Insurance Policies for keeping them valid till the completion of the work. The Contractor shall ensure that Insurance Policies are also taken for the workers of his Sub-Contractors / specialized agencies also. Without prejudice to any of its obligations and responsibilities specified above, the Contractor shall within 10 days from the date of letter of acceptance of the tender and thereafter at the end of each quarter submit a report to the Department giving details of the Insurance Policies along with Certificate of these insurance policies being valid, along with documentary evidences as required by the PMC. No work shall be commenced by the Contractor unless he obtains theInsurance Policies as mentioned above. Also, no payment shall be made to the Contractor on expiry of insurance policies unless renewed by the Contractor. Nothing extra shall be payable on this account. No claim of hindrance (or any other claim) shall be entertained from the contractor on these accounts.

1.49. The Contractor shall at all reasonable times provide access to the PMC orhis authorized representative to the workshops, factories or other places where materials

are stored, for inspection and/or collection of samples. Nothing extra shall be payable on this account.

1.50. PREPARATION OF MOCKUPS AND SAMPLE UNITS

i) The contractor shall prepare & display mock-ups in actual position of each and every item and obtain approval of PMC before execution en masse. The mockup shall be preserved for the purpose of reference till completion of the item represented by the mockup. Similarly, the contractor shall prepare two sample toilet blocks for each building comprising of all finishes and fittings included in the scope of this contract. Approval of PMC shall be obtained before taking up finishing works inmass. The work executed in approved mock ups / sample units in actual position forming part of the main work shall be measured and paid to the contractor under the respective items of the contract. However, any mockup/sample not approved shall not be measured and paid. Also, the contractor shall have to dismantle and remove the same from the site ofwork at his cost. However, those mockup/ samples not prepared in actual position and notforming the part of main work shall not be paid.

1.51. Appointment of independent external monitors for monitoring of integrity pact

In order to achieve high standards of Integrity monitoring of the integrity pact, Independent External Monitors (IEMs) has been appointed by the Department for monitoring of integrity pact as per guidelines of CVC/competent authority of Nepal. The contractor shall extend fullcooperation to the IEMs in sharing of information and facilitating in the process of monitoring the implementation of integrity pact. The Particulars of IEMs appointed by CVC/competent authority of Nepal are given Schedule F.

1.52. Maintenance of Register

1. All test registers, MAS registers and Cement, Steel, Paint, Chemical etc. registers Site Order Book, Inspection Register, and Hindrance records are to be maintained at site. All test registers, site order book, MAS registers and Cement, Steel, Paint, Chemical etc. registers issued by the PMC shall be maintained by the contractor which will be reviewed by the officers of PMC at regular intervals.

2. **Maintenance of Register of Tests** –

(i) All the registers of tests carried out at Construction Site or in outside laboratories shall be maintained by the contractor which shall be issued to the contractor by PMC.

(ii) All Samples of materials including Cement Concrete Cubes shall be taken jointly with Contractor by PMC and out of this at least 50% samples shall be taken in presence of PMC. All the necessary arrangement shall be provided by the contractor. Cost of sample materials is to be borne by the contractor and he shall be responsible for safe custody of samples to be tested at site/lab.

(iii) All the test in field lab setup at Construction Site shall be carried out by the Engineering Staff deployed by the contractor which shall be 100% witnessed by PMC. At least 10% of the tests are to be witnessed by the PMC.

(iv) Minimum 10% test should be conducted in outside approved lab as directed by PMC. Nothing extra will be paid on this account.

(v) All the entries in the registers will be made by the designated Engineering Staff of the contractor and same should be regularly reviewed by PMC.

(vi) Contractor shall be responsible for safe custody of all the test registers.

(vii) Submission of statement of all test conducted at site/lab, material at Site Register along with each Running Account Bill and Final Bill shall be mandatory.

3. Maintenance of Material at Site (MAS) Register –

(i) All the MAS Registers including Cement and Steel Registers shall be maintained by Contractor which shall be issued to the contractor by PMC in the same manner as being issued to PMC field staff. Authenticated copies of bills / vouchers of materials which have to be entered in the MAS register are to be submitted by the contractor to PMC before making payments.

(ii) Each of the entry of receipt of material at site shall be 100% test checked by PMC.

(iii) Each MAS Register shall be checked by PMC at least once a week.

(iv) Cement Register shall be reviewed by PMC at least once in a month.

(v) It will be deemed that work so measured, checked and paid is of the required quality and standard, both in respect of ingredients as well as the intended functions it is supposed to perform. In other words, the work would not only meet the required specifications but also the workmanship as per sound engineering practices.

(vi) The PMC shall also have to check and sign the registers at suitable intervals in token of his ensuring compliance of the 'Quality Assurance Plan' for the work.

(vii) Copies of bills: Agency will provide authenticated copies of itemize bills of materials which has to be entered in the MAS Register viz steel, cement, bitumen, paint, water proofing or any other item suggested by the PMC.

1.53. THIRD PARTY QUALITY ASSURANCE

1. In order to achieve high standards of materials, workmanship and overall quality of the execution, an agency engaged by PMC to carry out third party inspections as part of 'third party quality assurance'. this agency will carry out the checks of the quality assurance procedures followed at site, take samples of the materials for independent testing and check the workmanship of the works carried out. the contractor shall extend full cooperation to the TPQA agency in facilitating the inspections and collection of samples and regulate the execution stages with regards to the hold and witness points which shall be strictly adhered to by the contractor. the next stage work shall not be undertaken atthe hold point stage and work shall be done in presence of the tpqa representative at the witness stage. the contractor shall be required to co- operate with agency in carrying out various activities including documentation at no extra timeand cost to the owner. in case of any adverse findings by the tpqa agency, the contractor shall do the needful rectifications to the entire satisfaction of the tpqa agency and PMC. if contractor fails to rectify the defects of the serious nature within a reasonable time frame

no further payment shall be made. if work is stopped due to non- rectification of defects and delay occurs on this account, no relief in completion of mile stone by way of grant of eot or any other relaxation be given.

2. TPQA will conduct the quality control test as per tpqa cpwd circular listed in handbook on total quality management 2019 and carry out tests on input materials and construction activity as per guidelines on quality control systems for building code and cpwd specification. random sampling of materials for testing will be done by tpq agency in such a way that a minimum of 10% of all mandatory test recommended as per cpwd specifications/ contracts specifications are covered and it represents the whole work. the samples shall be collected in presence of representatives of construction agency.
3. The TPQA shall be engaged by the department and consultation fess shall be paid by the department to tpqa directly.

1.54. LOCAL BODY PERMISSION

1.54.1 OBTAINING PLINTH LEVEL COMPLETION CERTIFICATE

1. The contractor shall submit the proposal to local body for obtaining plinth level permission from local body PMC or as required.
2. The contractor shall coordinate and facilitate for obtaining certificate from local bodies including getting the required site visits conducted by such authorities with a view to obtain the same. The contractor shall also be responsible for liasoning work required, if any, in this regard with the local bodies. Nothing extra shall be payable on this account. Statutory charges, fees etc. required to be paid to the local bodies in this connection shall be paid bythe contractor and shall be reimbursed by the Department to the contractor on production of proof of actual payment by him. It is clarified that the contractor shall be responsible for obtaining all the NO OBJECTION CERTIFICATES (NOCs) required for obtaining the plinth level completion.

1.54.2 OBTAINING BUILDING USE PERMISSION

1. The Contractor shall submit required sets of “AS BUILT” drawings for submitting the same to the Municipal Corporation / Local bodies etc. for obtaining various service connections, revised commencement certificate if required, completion certificate. The Contractor shall submit to the Department, 2 sets of “AS BUILT” drawings and also in soft copy (CD – 2 sets) in one of the standard software packages. Nothing extra shall be payable on this account.
2. The contractor shall coordinate and facilitate for obtaining certificate from local bodies including getting the required site visits conducted by such authorities with a view to obtain the same. The contractor shall also be responsible for liasoning work required, if any, in this regard with the local bodies. Nothing extra shall be payable on this account. Statutory charges, fees etc. required to be paid to the local bodies in this connection shall be paid by the contractor and shall be reimbursed by the Department to the contractor on production of proof of actual payment by him.
3. It is clarified that the contractor shall be responsible for obtaining all the NO OBJECTION CERTIFICATES (NOCs), lift clearance, Fire clearance, and the completion

certificates (building use permission) for the various works (covered under the scope of this tender) required for obtaining completion certificate (building use permission).

4. However, only Three (3) month after the date of completion shall be allowed for obtaining various NOCs and completion certificate (building use permission). An amount of 0.25% of work done shall be withheld from each RA bills of the Contractor towards the same. The contractor may however submit an irrevocable Bank Guarantee or e-bank guarantee in favour of PMC towards the same, to avoid withholding of amount of RA bills. A portion of this amount withheld shall be forfeited for non-performance, for every month delay in obtaining various NOCs and buildinguse permission submitting the same to the PMC, in a manner as given below.
    a. No amount shall be forfeited if the NOCs and completion certificate (building use permission) are obtained and submitted within three (3) months after date of completion of the work.
    b. If NOCs and level completion certificate (building use permission) are submitted after three (3) months of the date of completion of work, the amount forfeited shall be 10% of the withheld amount. The amount to be forfeited shall be calculated on daily basis.
    c. If NOCs and completion certificate (building use permission) are submitted after four (4) months of the date of completion of work, the amount forfeited shall be 30% of the withheld amount (i.e., 10% for one month and 20% for secondmonth delay).
    d. If NOCs and completion certificate (building use permission) are submitted after Five (5) of the date of completion of work, the amount forfeited shall be 60% of the withheld amount. (i.e., 10% for one month and 20% for second month delay and 30% for the 3rd month delay).
    e. If NOCs and completion certificate (building use permission) are submitted after six (6) months of the date of completion of work, the amount forfeited shall be 100% of the withheld amount. ((i.e. 10% for one month and 20% for second month delay,30% for the 3rd month delay and 40% for the fourth month delay).
    f. The contractor shall submit all the NOCs and completion certificate (building use permission) simultaneously and no consideration shall be given for obtaining and submitting some (and not all) NOCs and completion certificate (building use permission) while forfeiting the amounts as mentioned above.
    g. If the contractor fails to obtain the NOCs and completion certificate (building use permission) up to six months from the date of completion of the work, the defect liability period shall get extended by the same period as delay (in obtaining NOCs and completion certificate (building use permission)) beyond the six (6) months after the date of the completion of the work. No claim of any kind shall be entertained from the contractor on these accounts.

1.55. FACILITIES FOR THE DEPARTMENT

In the Facility for Department/IBC: "The IBC intends to have a small supervisory team at the location on regular basis. These are besides the PMC who would be located in fall strength at site. The contractor thus has to put in place three rooms for IBC officials, PMC and the Consultant Architect with aesthetically well design and comfortable arrangement. These should include adequate electric light fittings, ACs, fans, broadband and sitting arrangements for six officials in each room. Adequate toilet facilities should also be for exclusive use by IBC officials."

SPECIAL CONDITIONS FOR CEMENT AND STEEL REINFORCEMENT BARS

1. **Special conditions for Reinforcement Bars:**

1.1. The contractor shall procure TMT bars of Fe500D/Fe550D grade from SAIL, Tata Steel Ltd., RINL, Jindal Steel & Power Ltd. and JSW Steel Ltd. The contractor may also procure IS marked TMT bars of various grades from the steel manufactures or their authorized dealers (as per following selection criteria) have valid BIS license for IS: 1786-2008 (Amendment -1 November 2012) from the producers fulfilling the following criteria.

1.2. The procured steel should have following qualities: -

i) Excellent ductility, bend ability and elongation of finished product due topossible refining technology.
ii) Consumption of steel should be accurate as per design.
iii) Steel should have no brittleness problem in finished product.
iv) Steel should carry the quality of corrosion and earthquake resistance.
v) Quality steel with achievement of proper level of Sulphur and phosphorus asper IS: 1786-2008.

1.3. Selection criteria of steel manufacturers

Have following selection criteria of steel manufactures: -

Steel producers of any capacity using iron ore/ processed iron ore as the basisraw material adopting advance refining technologies as given hereunder,

(i) DRI-EAF = Direct Reduced Iron – Electric arc furnace.

(ii) BF-BOF = Blast furnace – Basic oxygen furnace

(iii) CORES-BOF = COREX - Basic oxygen furnace

For production of liquid steel to finish product at single/multiple locations with NABL or any other similarly placed accrediting Government body which operatesin accordance with ISO/IEC 17011 and accredits labs as per ISO/IEC 17025 conforming to IS: 1786-2008 (Amendment -1 November 2012). Following is the check lists for incorporation any quality steel producer for technical assessment.

Sl.	Item	Checkpoint	Remarks
1	Steel producer having manufacturing facilities at Plant	a. Factory address and	
		b. Certificate of manufacturing	
		c. Refining process of steel	
		c.1 BF-BOF route	
		c.2 Corex-BOF route	
		c.3 DRI-EAF route	
		With documentary evidence either	
		d. Steel plant having infrastructure for producing sponge iron, billete and TMTRebars	
		e. Production and Quality Flow	

		f. Plant Evaluation and Process	
		g. List of Plant & Machinery	
2	Established	**Document verification for :**	
		a. Govt./PSU Approvals	
		b. Supply orders of TMT Re – bars in Govt. Projects (Minimum – 5 years)	
		c. Verification of direct supply orders to any State/Central Govt. Department	
		d. User Certificate issued by any Govt. Department directly	
3	Indigenous	**Documents evidence like:**	
		a. Certificate of Incorporation	
		b. Memorandum of Articles of	
		c. Credit rating of the companyfrom CARE/CRISIL/ICRA should not be C/D grade (minimum last 3 year)	
4	Reliable	a. Test Results from Govt./NABL accredited laboratories	
		b. In – house testing facility for physical/chemical tests (NABL accredited)	
		d. Calibration certificates	
		e. List of lab Equipments:	
		e.1 Spectrometer	
		e.2 Computerized UTM	
5.	Use of Iron – Ore/ Processes Iron	Verification of Iron –Ore/ Process iron ore invoices	
6.	In house rolling facility	Plant verification to identify in house rolling facilities, production	
7.	Licences and Certificates	a. ISO 9001:2008 Certification	
		b. ISO 14001:2004 Certification	
		c. OHSAS 18001:2007	
		d. IS 1786:2008 (TMT Re- bars	
		e. IS 2830:1992 (Billets)	
8.	Product Range	TMT Re – bars FE	
		CRS (Corrosion Resistant) & EQR (Earthquake Resistant) TMT Re-bars Size 8 to 36 mm dia	

Note:

DRI-EAF-> Direct Reduce Iron-Electric ARC Furnace

BF-BOF-> Blast Furnace-Basic Oxygen Furnace

COREX BOF-> COREX Furnace-Basic Oxygen Furnace.

The Architect Consultant shall approvethe steel manufacturers.

1.4. The contractor shall have to obtain and furnish test certificates to the PMC in respect of all supplies of steel brought by him to the site of work.

1.5. Samples shall also be taken and got tested by the PMC as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week time on written orders from the PMC to do so.

1.6. The steel reinforcement bars shall be brought to the site in bulk supply of 10 tonnes or more, as decided by the PMC.

1.7. The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extrashall be paid on this account. Bars of different sizes and lengths shall be stored separately tofacilitate easy counting and checking.

1.8. For checking nominal mass, tensile strength, bend test, re-bend test etc. specimens of sufficient length shall be cut from each size of the bar at random,ant at frequency not less than that specified below:

Size of bar	**For consignment below 100 tonnes**	**For consignment above 100 tonnes**
Under 10 mm dia bars	**One sample for each 25 tonnes or part thereof**	**One sample for each 40 tonnes or part thereof**
10 mm to 16 mm dia bars	**One sample for each 35 tonnes or part thereof**	**One sample for each 45 tonnes or part thereof**
Over 16 mm dia bars	**One sample for each 45 tonnes or part thereof**	**One sample for each 50 tonnes or part thereof**

1.9. The contractor shall supply free of charge the steel required for testingincluding its transportation to testing laboratories. The cost of tests shall be borne by the contractor.

1.10. The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as per procedure prescribed in clause 42

of the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations recovery at the rate so prescribed shall be made. In case of excess consumption, no adjustment needs to be made.

1.11. The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the PMC.

1.12. For the purpose of payment, the actual weight of reinforcement steel shall be worked out as below:

1.13. To arrive at unit weight for the purpose of payment three random samples each of 1 meter length shall be collected for each diameter of re-bar from every consignment received at site. Actual weight of three specimens for each diameter shall be taken and average weight calculated and recorded. The average weight so arrived at shall be compared with the theoretical weight of that particular diameter of rebar. Actual or theoretical weight whichever is less shall be considered for making payment for that consignment. However final payment shall be made on the basis of weighted average of all the consignment. The decision of the PMC as regards therandom samples and average weight shall be final and binding on the contractor andno claim of any kind shall be entertained in this regard.

2. CONDITIONS WHERE CEMENT IS TO BE PROCURED BY THE CONTRACTOR

2.1. The contractor shall procure 43/ 53 grade ordinary Portland cement conforming to IS 8112/Portland Pozzolana Cement conforming to IS: 1489 (Part-I) as required in the work, from reputed manufacturers of cement suchas ACC, Ultratech, Vikram, Shree Cement, Ambuja, Jaypee Cement, Century Cement & J.K. Cement **or from any other reputed cement Manufacturer having a production capacity not less than one million tonnes per annumas approved by Architect for that sub region.**

2.2. The cement shall be brought at site in bulk supply of approximately 50 tonnes or as decided by the PMC. The cement godown of the capacity to store a minimum of 2000 bags of cement or as decided by the PMC shall be constructed by the contractor at site of work for which no extra payment shall be made.

2.3. Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the PMC or his authorized representativeand the keys of the other lock shall remain with the contractor. The contractor shallbe responsible for the watch and ward and safety of the cement godown. The contractor shall facilitate the inspection of the cement godown by the PMC at any time.

2.4. The cement shall be got tested by the PMC and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The cost of tests shall be borne by the contractor in the manner indicated below:

2.5. The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedureprescribed in clause 42 of the contract and shall be governed by conditions laid therein. In case the cement consumption is less than the theoretical requirement including permissible variation, recovery at the rate prescribed in Schedule F shall be made. In case of excess consumption, no adjustment shall be made.

2.6. Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the PMC.

2.7. Damaged cement, noticed if any shall be removed from the site immediately by the contractor on receipt of a notice from the PMC. In the absence of compliance within 3 days of receipt of such notice, the PMC shall be at liberty to get the same removed from the site at the cost of the contractor.

SPECIAL CONDITION FOR COMPLIANCE OF GREEN BUILDING

1. It is envisaged to obtain **5-star GRIHA rating from GRIHA COUNCIL** for building to be constructed under this contract. The contractor shall take reference to all the conditions as part of his contractual obligation. For details, please refer https:/grihaindia.org/ . Rate quoted by the agency deemed to be inclusive of expenditure onthis account and nothing extra shall be paid for this compliance.

Particular Specification for Civil Component

Note : All materials and their brands to be used in this project specified by Consultant Architect shall have to be mandatorily approved by PMC.

1. Particular specification for Earthwork

1.1. Earthwork in excavation, in general, shall be carried out as per the CPWD Specifications.

1.2. The excavation shall be carried out at the site, where there existed the buildings, which were demolished. The excavation shall in this subhead shall be inclusive of malba or demolished remaining's of the structure and nothing shall be paid extra for this.

1.3. The earthwork in excavation, wherever required, shall be carried out in slushy position. Rates for earthwork shall include cost of the element for working in or underwater / liquid mud including pumping of water / liquid mud. Nothing extra shall be payable on this account. Therefore, the Contractor shall quote his rates after studying the site conditions.

1.4. De-watering shall be carried out by suitable means with adequate stand-by arrangements of pumps etc. And it shall be ensured that its disposal is carried out as per the regulations of the local bodies. The agencies are, therefore, advised to inspect and acquaint themselves of the site and location of disposal point(s) of water / slush and satisfy themselves as regards method of pumping and disposal required to be adopted. Any default or failure on the part of the Contractor to acquaint him with the aforesaid aspect of work shall not absolve him from his responsibility for the execution / performance of this contract. Also, all permissions in this regard, to be taken from local authorities, shall be obtained by the Contractor. Nothing extra shallbe payable on these accounts.

1.5. In trenches where surface water is likely to get into cut / trench during monsoons, a ring bund of puddle clay or by any other means shall be formed outside, to the required height, and maintained by the Contractor. Also, suitable steps shall be taken by the Contractor to prevent back flow of pumped water into the trench. Nothing extra shall be payable on this account.

1.6. The cost of de watering or working under water and / or liquid mud for execution of all the items for the work is deemed to be included in quoted rates of the respective items and shall not be measured separately for payment. Nothing extra shall be payable for de watering in this work, irrespective of whether specified or not, in the item descriptions or in the specifications / conditions in this contract agreement.

1.7. This shall also include water encountered from any sources such as rains, floods, sub soil water table being high and/or due to any other cause whatsoever.

2. Particular specification for Anti termite treatment :

2.1. The anti-termite work shall be got executed through one of the specialized agencies as per the list of approved agencies attached with the tender. The approved agency shall be authorized applicator of the manufacturer of the chemical used for anti-termite. The Anti termite agency shall carry out work with one of the approved chemicals mentioned in the tender. If so, specifically requested by the contractor, he will be allowed to use other chemical compound, as per IS 6313 part 2, meeting various technical parameters, subject to prior approval of PMC.

2.2. The work under this sub-head in general shall be carried out as per the CPWD specifications, as per the manufacturer's specifications, as per architectural drawings and as per directions of PMC.

2.3. Ten years guarantee in prescribed proforma attached shall be given by the contractor for the Anti termite treatment. In addition, 10% (ten percent) of the cost of these items of anti-termite shall be retained as guarantee amount to watch the performance of the work executed. However, half of this amount (withheld) would be released after five years from the date of completion of the work, if the performanceof the anti-termite work is satisfactory. The remaining withheld amount shall be released after completion of ten years from the date of completion of work, if the performance of the work is satisfactory. If any defect is noticed during the guarantee period, it should be rectified by the contractor within seven days of issuing of noticeby the PMC and, if not attended to, the same shall be got done by PMC through other agency at the risk and cost of the contractor and recovery shall be affected from the amount retained towards guarantee. The guarantee amount can be released in full, if bank guarantee or e-bank guarantee of equivalent amount, valid for the duration of guarantee period, is produced and deposited with the Department.

2.4. A guarantee bond on appropriate stamp paper (shall be duly signed in triparty, contractor, specialized agency/manufacturer of chemicals) shall be given by the contractor to the client in the manner form prescribed in Annexure A, below.

2.5. Execution of anti-termite treatment:

2.5.1. Chemical preparation of Suspension Concentrate preparation with Imidacloprid:10.5 ml of Imidacloprid 30.5 SC (Suspension Concentrate) shall be diluted with 5 liters of water to get 1 percent suspension in accordance with IS 6313(Part-II) – 2013.

2.6. Precautionary Measures:

2.6.1. Application shall be done only by the trained operators in accordance with the manufacturer specifications.

2.6.2. Health and safety precautions recommended by the manufacturer shall be strictly followed during application.

2.6.3. Soil treatment should not be carried out when it is raining or when the soil is wet with

rain or sub soil water.

2.6.4. In the event of water logging, application shall be done only after pumping out the water or allowing sufficient time for the water level to subside.

2.6.5. Surfaces not intended to have the treatment shall be protected well.

2.6.6. Graduated containers shall be used during the preparation as well as application of emulsion.

2.6.7. Pressure pump of adequate capacity along with hand / power operated compressed air sprayer shall be used for application.

2.6.8. Chemical shall be directed towards the surface during the application.

2.6.9. Treated soil barriers should not be disturbed. If by chance treated soil barriers are disturbed, steps shall be taken to restore the continuity or completeness of the barrier system.

2.6.10. Applications shall be done uniformly at the prescribed rate in all stages of treatment.

The material brought at site shall be entered in MAS register and shall be issued by department as and when required by the contractor. The theoretical consumption of chemical shall not be in any case less than the actual requirement as per item nomenclature.

2.7. Treatment for RCC Foundations
Treatment of RCC Foundations (Buildings without Basements):

2.7.1. Treatment shall start at a depth of 500 mm below the ground level. If the ground level is raised or lowered either by filling or cutting after the foundations have been cast, then the above-mentioned depth of 500 mm shall be determined from the new soil level resulting from the filling or cutting. Dosage for treatment shall be at the rate of 7.5 litres per sq. Metre.

2.8. Treatment of Top surface of Plinth Filling

2.8.1. Treatment top surface of the consolidated earth fill within plinth walls shall be treated by surface application with chemical emulsion at the rate of 5 litres per Sqmof the surface before laying the sub grade.

2.8.2. In case of very well compacted filled earth, where surface does not permit the emulsion to seep through, then holes with 12 mm die mild steel rod with depthvarying from 50 to 75 mm shall be made at 150 mm centres both ways for dosing the chemical thereby ensuring better saturation. The horizontal distance between hole and the wall shall be as minimum as possible. After application, holes shall be filled with soil once again.

2.9. Treatment at Junction of Wall and Floor:

2.9.1. Special care shall be taken to establish continuity of the vertical chemical barrier on inner wall surfaces from ground level (where it had stopped with the treatment described in "Treatment to Vertical Backfilled Soil along Masonry Foundation/Retaining Wall") up to the level of the filled earth surface.

2.9.2. To achieve this, a channel of size 30mm (wide) x 30 mm (deep) shall be made at all the junctions of walls/columns with the floor (before laying the subgrade). Channel shall be parallel to wall/column and the horizontal gap between channel and wall shall be as minimum as possible. Rod holes shall be made in the channel at 150mm. Centres and the iron rod moved backward and forward to break up the earth. Depth of Rodding shall be in such a manner that the continuity of the chemical barrier below is maintained.

2.9.3. The chemical shall be poured into the channel at the rate of 7.5 litres per sq. of the vertical surface and allowed to soak through the holes fully so that the soil is in contact with the chemical. The channel and Rod holes shall be back filled with soil once again and compacted well after completing the operation.

2.10. Precautionary Measures

2.10.1. After the building is completely constructed, the earth along the external perimeter of the building should be rodded at intervals of 150 mm (parallel to the wall) and to a depth of 300 mm. The horizontal distance between the hole and the wall shall be as minimum as possible. The depth of 300 mm mentioned shall be increased if required so that the continuity of the chemical barrier created below is maintained.

2.10.2. Chemical shall be poured on the holes at the rate of 7.5 litres per square metre of vertical surface and rodding shall be done simultaneously (on the holes) by moving the rod backward and forward.

2.10.3. After the treatment, rod holes shall be back filled with soil once again and compacted well.

2.10.4. When the earth outside the building is graded on completion of the building, this treatment should be carried out on completion of such grading.

2.11. Treatment of soil surrounding pipes, Wastes and Conduits:

2.11.1. This is applicable for the pipes, waste or conduit which enters basement only.

a) At the point of entry of the foundation area, the soil surrounding the point of entry shall be loosened around for a distance of 150mm, i.e., Diameter of loosening shall be outer diameter of pipe plus 150mm on both sides of the outer diameter. Depth of loosening shall be 75mm (min).

b) At the point of entry of the basement wall, diameter of loosening shall be outer diameter of pipe plus 300mm on both sides. Depth of loosening in this case shall also be 75mm (min).

c) Dosage shall be 7.5 litres per square metres of the developed surface of the loosened soil.

3. For pipes, wastes, conduits which does not enter the building and which runs parallel to the building (without entering) at a clear distance of 75mm (min) or more, this treatment shall be excluded only after getting approval from Engineer in charge.

4. Particular specification for Concrete and RCC Work

4.1. General:

i. The work in general shall be carried out as per the CPWD specifications.

ii. All nominal concrete used at site shall be machine mixed at site.

iii. Design mix concrete from fully automatic computerised concrete batching and mixing plant.

iv. The Concrete and design mix concrete used at site shall have minimum replacement of OPC with BIS recommended waste material (such as Flyash, Slag etc) of more than 30% by weight of cement. **(As per GRIHA criterion 19.1.1)**

v. The contractor shall ensure that 5% replacement of natural aggregate with RCA/RA by weight of that category in structural concrete / design mix concrete (**(As per GRIHA criterion 19.1.2)**

4.2. Proportioning Concrete

4.2.1. In proportioning cement concrete, the quantity of both cement and aggregates shall be determined by weight. The cement shall be weighed separately from the aggregates. Water shall either be measured by volume in calibrated tanks or weighed. All measuring equipment shall be maintained in a clean and serviceable condition.The amount of mixing water shall be adjusted to compensate for moisture content in both coarse and fine aggregates. The moisture content of aggregates shall be determined in accordance with IS: 2386 (Part III). Suitable adjustments shall also be made in the weights of aggregates to allow for the variation in weight of aggregates due to variation in moisture content.

4.3. Production of Concrete

4.3.1. The concrete shall be produced in a central batching and mixing plant with, computerized printing for contents and admixture dosage. The batching plant shall be fully automatic. Automatic batcher shall be charged by devices which, when actuated by a Single starter switch will automatically start the weighing operation of each material and stop automatically, when the designated weight of each material has been reached. The batching plant shall have automatic arrangement for dispensing the admixture and shall also be capable of discharging water in more than one stage. A print out from the batching plant for every lot shall be submitted. A batching plant essentially shall consist of the following components:

a. Separate storage bins for different sizes of aggregates, silo for cement; and water storage tank.

b. Batching equipment

c. Mixers

d. Control panels

e. Mechanical material feeding and elevating arrangements
f. Dust collector

4.3.2. The compartments of storage bins for aggregates shall be approximately of equal size. The cement compartment shall be centrally located in the batching plant. It shall be watertight and provided with necessary air vent, aeration fittings for proper flow of cement & emergency cement cut off gate. The aggregate and sand shall be charged by power operated centrally revolving chute. The entire plant from mixer floor upward shall be enclosed and insulated. The batch bins shall be constructed so as to by self-cleansing during drawdown. The batch bins shall in general conform to therequirements of IS: 4925.

4.3.3. WATER: a) Water to be used in manufacturing and curing of Concrete shall be tested before use. All such tests shall be submitted to the Engineer in charge for his approval before water is used in work.

4.3.4. Contractor shall identify the location of source of water intended to be used. Each such source of water shall be separately tested. In the event of a change in source of water all tests specified herein shall have to be repeated.

4.3.5. In the event of water is drawn from tube wells or open wells, water samples shall be for seasonal fluctuations in water table or at intervals to be directed by the Engineerin charge.
Water samples from each source shall be tested as under:

Test	Number of tests for each source
Acidity	3
Alkalinity	3
Presence of Solids	3

4.3.6. Mean values of the above tests shall be taken as the representative value and the acceptance criteria shall be based on these test results. All testing procedure and computation of test results shall conform to IS: 3025.

4.3.7. Approved quality water shall be collected and stored in the Under Ground sumps/elevated tanks for the day-to-day requirement of work and same shall be used for all cement works and also for curing. Due care shall be taken in this regard.

4.3.8. If Government source of supply is nearby and made available to the contractor; the contractor may use that water and accordingly, charges of metered water consumption at the rate decided by the PMC will be deducted from the bills payable to him. However, testing procedure & frequency & storage modalities will remain same. Whatever may be the source of water, adequate capacity for storageshall be made. If required, RO PLANTS of sufficient capacity shall be established at his own cost.

4.3.9. The batching equipment shall be capable of determining and controlling the

prescribed amounts of various constituent materials for concrete accurately i.e., Water, cement, sand, individual size of coarse aggregates etc. The accuracy of the measuring devices shall fall within the following limits.

Measurement of Cement	±2% of the quantity of cement in each batch
Measurement of Mineral Admixture	±2% of the quantity of cement in each batch
Measurement of Water	±3% of the quantity of water in each batch
Measurement of Aggregate	±3% of the quantity of aggregate in each Batch
Measurement of Admixture	±3% of the quantity of admixture in each Batch

In a batching plant, the concrete production equipment shall be calibrated initially at the time of installation or reconditioning of the equipment and subsequently at the following intervals-

Mechanical/knife edge system: At least once in every two months.
Electrical or load cell system: At least once in every three months.

NOTE:

i. All ingredients of concrete shall be used by mass except water and admixtures which may be by volume.

4.3.10. It is important to maintain the water-cement ratio constant at its correct value. To this end, determination of moisture contents in both fine and coarse aggregates shall be made as frequently as possible, the frequency for a given job being determined by the PMC according to weather conditions. The amount of the added water shall be adjusted to compensate for any observed variations in the moisture contents. For the determination of moisture content in the aggregates, IS 2386 (Part 3) may be referred to. Where batching plants are used, it is recommended to determine moisture content by moisture probes fitted to the batching plants. To allowfor the variation in mass of aggregate due to variation in their moisture content, suitable adjustments in the masses of aggregates shall also be made.

4.4. Mixing Concrete

The mixer in the batching plant shall be so arranged that mixing action in the mixers can be observed from the operator's station. The mixer shall be equipped with a mechanically or electrically operated timing, signalling and metering device which will indicate and assure completion of the required mixing period. The mixer shall have all other components as specified in IS: 4925.

4.5. Transportation, Placing and Compaction of Concrete

Mixed concrete from the batching plant shall be transported to the point of placement by transit mixers or through concrete pumps or steel closed bottom buckets capable of carrying 0.6 cum concrete. In case the concrete is proposed to be transported by transit mixer, the mixer speed shall not be less than 4 rev/ min. Of the drum nor

greater than a speed resulting in a peripheral velocity of the drum as 70 m / minute at its largest diameter. The agitating speed of the agitator shall be not less than 2 rev / min. Nor more than 6 rev / min. Of the drum. The number of revolutions of the mixing drum or blades at mixing speed shall be between 70 to 100 revolutions for a uniform mix, after all ingredients, have been charged into the drum. Unless tempering water is added, all rotation after 100 revolutions shall be at agitating speed of 2 to 6 rev / min. And the number of such rotations shall not exceed 250. The general construction of transit mixer and other requirements shall conform to IS: 5892.

In case concrete is to be transported by pumping, the conduit shall be primed by pumping a batch of mortar / thick cement slurry through the line to lubricate it. Once the pumping is started, it shall not be interrupted (if at all possible) as concrete standing idle in the line is liable to cause a plug. The operator shall ensure that some concrete is always there in the pump-receiving hopper during operation. The lines shall always be maintained clean and shall be free of dents.

Materials for pumped concrete shall be batched consistently and uniformly. Maximum size of aggregate shall not exceed one-third of the internal diameter of the pipe.Grading of aggregate shall be continuous and shall have sufficient ultra-fine materials (materials finer than 0.25mm). Proportion of fine aggregates passing through 0.25mmshall be between 15 & 30% and that passing through 0.125 mm sieve shall not be less than 5% of the total volume of aggregate. Suitability of concrete shall be through pumping shall be verified by trial mixes and by performing pumping tests.

4.6. PREPARATION OF MIXES AS PER APPROVED DESIGN MIX AND CONDUCTING CONFIRMATORY TEST AT FIELD LAB.

The contractor shall make the cubes of trial mixes as per approved Mix design at site laboratory for all grades, in presence of Engineer in charge using sample of approved materials proposed to be used in the work prior to commencement of concreting and get them tested in his presence to his entire satisfaction for 7 days and 28 days. Test cubes shall be taken from trial mixes as follows.

For each design mix, a set of six cubes shall be made from each of the three consecutive batches. Three cubes from each set of six shall be tested at age of 7 days and remaining three cubes at age of 28 days. The cubes shall be made, cured, transported and tested strictly in accordance with specifications. The average strength of nine cubes at age of 28 days shall exceed the specified target mean strength for which design mix has been approved, the evaluation of test results will be done as per IS: 456-2000.

4.7. Ultrasonic Pulse Velocity Method of Test for RCC

The underlying principle of assessing the quality of concrete is that comparatively higher velocities are obtained when the quality of concrete in terms of density, homogeneity and uniformly is good. The consistency of the concrete as regards its general quality gets established. In case of poorer quality lower velocities are obtained. If there are cracks, voids or flaws inside the concrete which come in the way of transmission of pulse, lower velocities are obtained.

The quality of concrete in terms of uniformity, incidence or absence of internal

flaws, cracks and segregation etc. Indicative of the level of workmanship employed, can thus be assessed using the guidance given in table below, which have been evolved for characterizing the quality concrete in structure in term of the ultrasonic pulse velocity.

Velocity criterion for Concrete Quality Grading.

Sl. No.	Pulse velocity by Cross Probing (km/sec)	Concrete Quality Grading
1	Above 4.5	Excellent
2	4.5 to 3.5	Good
3	3.5 to 3.0	Medium
4	Below 3.0	Doubtful

Note: In Case of "doubtful" quality it may be necessary to carry further tests.

Pulse velocity method of test of concrete is to be conducted as a routine test. The acceptance criteria as per the above table will be applicable which is as per IS 13311 (part-1): 1992. From the above "Good" and "Excellent" grading are acceptable and below these grading the concrete will not be acceptable.

All RCC Columns and 5% of the other of RCC members in each category i.e., Beam, column, slab and footing may be tested by UPV test method for establishing quality of concrete. It is suggested that test be conducted on RCC beam near joint with column, on RCC column near joint with beam, on RCC footings and rafts. On RCC rafts asuitable grid can be worked out for determining number of tests. In addition, doubtful areas such as honeycombed locations, locations, where continuous seepage is observed, construction joints and visible loose pockets will also be tested.

The test results are to be examined in view of the above acceptance criteria "Good" and "Excellent" and wherever concrete is found with less than required quality as per acceptance criteria, repairs to concrete will be made. Honeycombed areas and loose pockets will be repaired by grouting using Portland Cement Mortar/Polymer Modifies Cement Mortar /Epoxy Mortar, etc. After chipping loose concrete in appropriate manner. In areas where concrete is found below acceptance criteria and defects are not apparently visible on surface, injecting approved grout in appropriate proportion using epoxy grout /acrylic Polymer modified cements slurry made with shrinkage compensating cement / plain cement slurry etc. will be resorted to for repairs. Repairs to concrete will be done till satisfactory results are obtained as per the acceptance criteria by retesting of the repaired area. If satisfactory results are not obtained dismantling and relaying of concrete will be done.

4.8. SPECIAL CONDITIONS FOR DESIGN MIX CONCRETE FOR BATCHING PLANT.

4.8.1. The term machine batched, machine mixed and machine vibrated design mix cement concrete used in the document shall mean the concrete produced at site in fully automatic concrete batching & mixing plant (IS 4925), placed in position by the concrete pump and vibrated by surface vibrator/ needle vibrator/ plate vibrator, as the case may be to achieve required strength and durability. (However, for small elements like lintels, hajjes, shelves etc., the requirement of pumping would be dispensed with as per direction of PMCand placement would be done through alternative means).

4.8.2. Approved admixtures conforming to IS-9103 shall be permitted to be used. The chloride content in the admixture shall satisfy the requirement of BIS 5075. The total amount of chloride content in the admixture mixed concrete shall satisfy the requirement of IS 456-2000.

4.8.3. The concrete mix design with and without admixture will be carried out by the contractor through the laboratory to be approved by the PMC.

4.8.4. The various ingredients for mix design/ laboratory tests shall be sent to the lab/test houses through the PMC and the samples of such ingredients sent shall be preserved at site till completion of work or change in Design Mix whichever is earlier. The sample shall be taken from the approved materials, which are proposedto be used in the work.

4.8.5. The contractor shall submit the mix design report from approved laboratories or government engineering college for approval of PMC within 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the mix design is approved.

4.8.6. The contractor shall make cubes of trial mixes as per approved mix design at site laboratory for all grades of concrete in presence of the PMC using same ingredients as adopted for design mix, prior to commencement of concreting and get them tested in presence of Engineer- in – Charge for 7 days and 28 days. For each design mix, a set of six cubes shall be prepared from each of the three consecutive batches. Three cubes from each set shall be tested at the age of 7 days and three cubes at the age of 28 days. The cubes shall be made, cured, transported and tested strictlyin accordance with CPWD specification. The average strength of nine cubes at the age of 28 days shall exceed the specified target mean strength for which design mix has been approved. Tests shall be done at the laboratory as approved by the PMC.

4.8.7. For each change of source or quality / characteristic properties of the ingredients during the work, from that approved & used in the concrete mix a fresh mix design shall be got done by the contractor. Revised trial mix test shall be conducted and shall be submitted by the contractor as per the direction of the PMC.

4.8.8. The cost of packaging, scaling, transportation, loading, unloading cost of samples and the testing charges for mix design in all cases shall be borne by the contractor.

4.8.9. The mix design shall be done considering the degree of quality control as ‘very good’ in all cases.

4.8.10. The rate quoted by the agency for the mix design items shall be net & nothing extra shall be payable on account of change in quantities of concrete ingredients like sand, aggregates and admixtures etc. As per the approved mix design until unless specified elsewhere in the Notice Inviting Tender Documents.

4.9. Establishment of Batching Plant at the approved site:

4.9.1. The contractor is required to establish batching plant at the site. If it is not possible to establish it captive in site, it may be established as near to site as possible. However, the contractor is required to obtain permission to establish batching plant from the concerned local bodies and from the pollution control Board as well. Moreover, as the project is planned to refer 5 Star rating of GRIHA, the contractor is required to take reference adhere to the norms of GRIHA, any special equipment if required shall be installed for which nothing shall be paid extra.

4.9.2. Dust from cement, sand and aggregate is a pollutant. Fine dust particles can enter neighbouring premises and adversely affect amenity. Dust must be controlled so there are no significant emissions from the plant.

The following are some of the prevention measures to be taken by the Contractor during the operation to reduce concrete batching plant pollution so the people living around the batching plant areas are not affected by any negligence that might turn to be environmental hazard. The following guidelines must be adhered by the contractor for which nothing shall be paid extra.

4.9.3. Maintenance and general site operations:

Maintain all the equipment including dust collection equipment to prevent any leaks.

Identify a buffer zone that surrounds your operations in which you are planning to contain dust generating activities.

Provide safety, quality and environments management system for the site and plant operations, as well as the delivery system.

4.9.4. Fabric Filter Dust Collector (FFDC):

The FFDC should be sized so that the dust collector bags are not subject to clogging. Install an appropriately sized multi bag pulse jet filter in the silo, which is fitted and used in accordance with the manufacturer's recommendations.

The FFDC should be completely protected from the weather.

The FFDC needs to be made of a material which can withstand continuous exposure to cement –such as polyester and polypropylene.

The filter elements should be cleaned automatically at the end of the silo filling cycle.

The FFDC should be able to withstand the maximum pressure differential which may be encountered. A differential pressure indicator should be fitted to an alarm to indicate bag filter pressure in excess of 1.0 Kpa.

Silos should be protected against internal pressures exceeding the design pressure. Positive type relief valves set at appropriate pressures should be installed. The relief valve should be ducted to a container on the ground, able to collect dust particles.

The exhaust air from the silo filters should be ducted to a dust collection container on the ground. Connected to the automatic silo overfill protection circuit to stop the flow of cement if a filter bag bursts. The FFDC should be inspected at least once a week and any necessary repairs carried out immediately.

Use dust suppression system to reduce suspended particulate matter in the air to a minimum. Wherever possible, keep the sand and aggregates under cover so that is not

blown away by wind. Use the enclosed batch mixer feed as dust prevention and visible emissions. Use the spray device to prevent dust emissions. Conduct all the mixing operations from an enclosed building to help prevent emission of dust.

4.9.5. Conveyors:

To prevent dust emissions, the belt conveyors should be enclosed with metal board on top and on the two sides.

Fitting the flexible seals to prevent dust should enclose all conveyor transfer points.

The turning point of all the conveyors should be provided with scrappers to prevent dust collection on the surface belt.

4.9.6. Mixing and loading operations:

Loading concrete trucks should be in such a way that minimizes dust emissions.

All the air borne dust emission generated by material loading and mixing operations should be vented to fabric filtering system.

The concrete mixers and other vehicles should be cleaned off after the loading and mixing operations to wash off the mud, dust deposited on the wheels and body.

4.9.7. Fugitive dust:

Use water sprays or dust suppression agents to reduce dust.

An air extraction and filtration system for collecting the generated dust should be installed.

The roof should be extended at least 6 feet beyond the load areas.

4.9.8. Waste water:

Waste and contaminated water should be directed to onsite settling ponds and it can be reused later in for dust control, rinsing trucks exteriors.

In any circumstance Waste water should not be allowed to go in contact with any fresh water bodies.

4.9.9. COVER BLOCKS:

Contractor shall use factory made cover blocks of approved shape and strength for all RCC works to avoid displacement of bars in any direction and to ensure proper cover. Alternatively, the contractor may manufacture the cover blocks as per approved methodology by PMC. The grade of concrete shall be same grade as of Concrete in which they will be used. The concrete shall be fibre reinforced concretewith 6mm downgraded aggregate. Shape & size shall be as decided by PMC. For horizontal surfaces, fibre concrete cover blocks may be used and verticalsurfaces plastic circular spacers may be used, viz: Conbextra as manufactured by M/S Fosroc Chemicals India Ltd. Or approved by consultant architect)

5. <u>Particular Specifications for AAC block masonry</u>

5.1. The AAC blocks and concrete blocks used at site shall have minimum 40% fly ash content by weight (**(As per GRIHA criterion 19.1.3)**

5.2. The work in general shall be carried out as per the CPWD specifications.

5.3. The AAC blocks shall conform to Grade I of IS: 2185 (Part 3)–1984 and shall be procured from the approved manufactures only.

5.4. The material received at site shall be fully cured and shall have attained the required strength before delivery to the site. The material shall be free of cracks.

5.5. The AAC blocks shall be supplied in the required sizes as approved by the PMC.

5.6. The samples of AAC blocks (each sample consisting of 6 specimen) shall be collected randomly from the lot procured and tested for various parameters specified below. One sample shall be tested for every 100 cum or part thereof. However, minimum one sample shall be tested from each lot received at site if the quantity procured in the lot is less than 100 cum. If required, PMC or his authorized representative shall inspect the factory during production of the material for this work and also collect samples (of materials used for making AAC blocks) from the factory itself.

5.7. AAC blocks shall be got tested for following parameters from any accredited laboratory approved by the PMC:

5.7.1. Compressive strength.
5.7.2. Oven Dry Density.
5.7.3. Thermal conductivity.
5.7.4. Drying shrinkage.
5.7.5. Dimensional Tolerances

5.8. The AAC blocks shall meet following parameters:

5.8.1. Compressive strength shall not be less than 4 N/sq. Mm.
5.8.2. Oven Dry Density shall not be more than 650 kg/cum.
5.8.3. Thermal conductivity shall not be more than 0.24 W / m.k
5.8.4. Drying shrinkage shall not be more than 0.05%
5.8.5. Dimensional Tolerances in the size shall not be more than ± 5mm for length and ± 3mm for height and width.

5.9. AAC masonry work shall be executed as per the specifications and instructions of thePMC.

5.10. The scope of work also includes chasing the AAC block masonry work for embedding pipes, laying conduits etc. And also making good the same by filling cement mortar 1:4 (1 cement: 4 coarse sand) for which nothing extra shall be payable. The chasing shall, however, be carried out using machine cutters in a workman like manner, so as not to disturb the joints in the masonry and without any cracks being developed in the AAC blocks and the masonry. Such defective work shall be replaced free of cost by the contractor.

5.11. Mode of measurement shall be same as of brick masonry work of CPWD Specifications.

6. Particular specification for wood work General

6.1. Wood work

6.1.1. The work in general shall be carried out as per the CPWD specifications.

6.1.2. The wood shall be selected best quality second-class teak wood.

6.1.3. The work shall be carried out in accordance with the architectural drawings issued by the department. The architectural drawings shall at all times be properly correlated

and architectural requirements have to be fully satisfied.

6.1.4. All the wood used for the manufacturing of the door shutters including the door frames, internal & external lipping, beading for fixing glazing etc. Shall be seasoned as per the requirements of the CPWD Specifications.

6.1.5. All the screws used for woodwork shall be fully threaded, counter sunk stainless steel screws, grade 304 and they shall be suitably concealed or plugged.

6.1.6. The glue / wooden adhesive to be used for this sub-head shall be pvac based adhesive, of approved make (Fevicol of Pidilite Industries Ltd. Or Korlok of National).

6.2. Factory made doors

6.2.1. The work shall be carried out as per the CPWD specifications.

6.2.2. The laminate/venner fixing on door shall be done at the factory with pressing machine. In no case laminate of doors shall be manually fixed.

6.3. Decorative high-pressure laminate

6.3.1. The work in general shall be carried out as per CPWD specifications.

6.3.2. The contractor shall procure and submit to the PMC, samples of laminate for approval. After approval of the samples, the contractor shall prepare a mock up for approval. The material shall be procured and the mass work taken up only after the approval of the mock up by the PMC.

6.3.3. Each type of laminate shall be obtained from only one of the approved manufacturers as specified and in one lot. Adequate spare quantity shall be ordered to cover for any damaged sheet and for replacement by the Contractor till the completion of the work.

6.3.4. The Contractor shall ensure that the edges of the laminates do not come out or chip / peel off during cutting and fixing of the laminates. Defective work on this account shall not be accepted and shall be redone by the contractor at his own cost.

6.4. Wooden Fire-Resistant Door (FRD) frames and shutters

6.4.1. The fire-resistant flush doors along with the frames shall be procured as a set from one of the approved manufacturers and shall be as per the specifications, as per description of the item and the approval of the PMC. The door shutters shall be entirely symmetrical on both faces. The complete door assembly shall have the required stability and shall satisfy performance required for integrity & insulation as per BS 476: Part 20 & 22 applicable for 2 hours fire rating. Besides, it shall conform to all the requirements for Flush door shutters as per the relevant IS codes and CPWD Specifications.

6.4.2. The gap between the shutter and frame, between shutters in case of double leaf shutter should not be more than 2mm. Similar care shall be taken for making rebates for fixing hinges and other hard wares. The workmanship required is of superior class forachieving the desired results.

6.4.3. Graphite based Intumescent strip seal of required size as per manufacturer's

specifications shall be provided and fixed in the grooves on the door shutters allaround the periphery except on the bottom to prevent penetration of smoke and fire. The shutters shall not be worked upon at site to prevent damage to the intumescent strip. In case of double leaf shutters, Intumescent strips, of required size as per manufacturer's specifications shall be fixed in the rebate portion of meeting styles of each leaf of the shutter.

6.4.4. All the FRD shutters shall be provided with 2nd class teak wood external lipping all around the shutter as per manufacturer's specifications. The grooves of required size and shape shall be made in the external wooden lipping for fixing intumescent seal. All the external visible surfaces of lipping will be finished with 3 coats of melamine polish.

6.4.5. The hinges to be used for fixing the door shutters shall be fire rated stainless steel ball bearing hinges of grade 304 fixed with stain steel screws of grade 304. While testing for fire resistance, the whole assembly shall be tested along with the door shutter, door frame, beadings, hinges, etc.

6.4.6. All the shutters shall be treated for anti-termite treatment, against woodborer, fungus, pests etc. Therefore, it shall be provided with the preservative treatment based on Boron & Fluoride and as per CPWD Specifications. Nothing extra shall be payable on this account.

6.4.7. The calcium silicate boards to be used for manufacturing fire rated door shutters shall be from one of the approved brands. It shall be non-combustible and shall conform to BS 476 part 4 and to class 1 of BS476 part 7 for surface spread of flame.

6.4.8. The contractor shall submit manufacturer's test certificate for specified fire rating for integrity and insulation criteria, required as per the item nomenclature and the specifications. The Contractor shall also co-ordinate and facilitate with the office of the Fire Officer for obtaining clearance for the FRD shutters along with frames including getting the required site visits conducted by such authorities with a view to obtain Fire NOC. The Contractor shall also be responsible for liaising work required, if any, in this regard. Statutory charges / fees etc. Required to be paid to the concerned authorities in this connection shall only be paid by the Department or shall be reimbursable to the Contractor on production of proof of actual payment by him.

6.4.9. Destructive Testing for fire resistance of the door shutter along with door frame shall be done in a laboratory approved by PMC. The complete door assembly should be able to resist thermal stresses and should not fail on account of shrinkage, cracking or distortion or any other reason, during testing for the duration for which itis fire rated. The cost of sample of door shutter along with the frame (including cost of laminates, beadings, intumescent strips, hinges, screws etc. But excluding painting, polishing etc.), packaging, sealing and transportation of sample to the approved laboratory etc., shall be borne by the Contractor. At least one finished sample (door shutter fixed to the door frame with hinges etc.) For two-hour fire rating shall be tested.

6.4.10. The sample shall be randomly chosen by the PMC, from the lot (of

shutter along with frame) procured and brought to the site of work for fixing. If the shutter fails to satisfy the test requirements, the entire lot shall be rejected and replaced by the Contractor at his own cost. Nothing extra shall be payable on this account and no delay shall be accepted on this account.

6.4.11. Testing charges shall be borne by the contractor

6.4.12. Measurement - For the purpose of payment, the area shall be measured from outer frame to outer frame above the finished floor level excluding the portion embedded inside floors, wall cladding. The door frame shall not be measured separately for payment. No deduction shall be made for making vision panel, if any.

7. Metal Fire Resistant Door (FRD) frames and shutters:

7.1. The fire-resistant metal flush doors along with the frames shall be procured as a set from one of the approved manufacturers and shall be as per the specifications, as per description of the item and the approval of the PMC. The metal door shutters shall be entirely symmetrical on both faces. The complete door assembly shall have the required stability and shall satisfy performance required for both stability & integrity as per BS 476: Part 20 & 22 and IS 3614 Part -2 applicable for 2 hours fire rating. Besides, it shall conform to all the requirements of fire rated flush door shuttersas per the relevant IS codes and CPWD Specifications.

7.2. The gap between the shutter and frame, between shutters in case of double leaf shutter should not be more than 3mm. Similar care shall be taken for making rebates for fixing hinges and other hard wares. The workmanship required is of superior class for achieving the desired results.

7.3. The hinges to be used for fixing the door shutters shall be fire rated stainless steel ball bearing hinges of grade 304 fixed with stain steel screws. While testing for fire resistance, the whole assembly shall be tested along with the door shutter, door frame, beadings, hinges, vision panels etc**.**

7.4. Honey comb paper or fire metal ceramic wool of 96 kg/M3 should be used for manufacturing the metal fire doors. The wool or honey comb paper shall be snugly fit in the internal frame work of the door shutter.

7.5. The contractor shall submit through the proposed manufacturer prior test certificates for the specified 2 hours fire rating for stability and integrity criteria for both single leaf and double leaf doors required as per the item nomenclature and the specifications. The test certificates shall clearly show that doors have been tested with vision panels and approved hardware to establish the technical credentials of theproposed manufacturer. The Contractor shall also co-ordinate and facilitate with the office of the Fire Officer for obtaining clearance for the FRD shutters along with frames including getting the required site visits conducted by such authorities with a view to obtain Fire NOC. The Contractor shall also be responsible for liaising work required, if any, in this regard. Statutory charges / fees etc. required to be paid to the concerned authorities in this connection shall only be paid by the Department or shall be reimbursable to the Contractor on production of proof of actual payment by him.

7.6. Destructive Testing for fire resistance of the door shutter along with door frame shall be done in a laboratory approved by PMC. The complete door assembly

should be able to resist thermal stresses and should not fail on account of shrinkage, cracking or distortion or any other reason, during testing for the duration for which it is fire rated. The cost of sample of door shutter along with the frame (including cost of intumescent strips, hinges, screws etc. but excluding painting, polishing etc.), packaging, sealing and transportation of sample to the approved laboratory etc., shall be borne by the Contractor. At least one finished sample (door shutter fixed to the doorframe with hinges etc.) for two-hour fire rating shall be tested.

7.7. The sample shall be randomly chosen by the PMC, from the lot (of shutter along with frame, vision panels and the proposed hardware) procured and brought to the site of work for fixing. If the shutter fails to satisfy the test requirements, the entire lot shall be rejected and replaced by the Contractor at his own cost. Nothing extra shall be payable on this account and no delay shall be accepted on this account**.**

7.8. Testing charges shall be borne by the Department provided that the door assembly fulfills the requirements of relevant specifications. If the door assembly fails to fulfill the requirements, testing charges shall be borne by the Contractor**.**

7.9. Measurement - For the purpose of payment, the area shall be measured from outer frame to outer frame above the finished floor level excluding the portion embedded inside floors, wall cladding. The door frame shall not be measured separately for payment. No deduction shall be made for making vision panel, if any.

8. <u>Particular specifications for door hardware and fittings</u>

8.1. General

8.1.1. The contractor shall procure and submit samples of various hardware's and fittings for approval, of the PMC. The material shall be procured and the mass workshall be taken up only after the approval of the samples by the PMC.

8.1.2. All the hardware and fittings shall be supplied with the required spindles, pivots, stud, connecting bolts, screws, grub screws, nuts, bolts, connecting pin / bolt (including stainless steel washers / shims, PVC washers, PVC buffers etc.) And of the material as per the manufacturer's specifications. Their cost is deemed to be included in the cost of the hardware and fittings to be supplied and these accessories shall not be measured separately for payment. If any of the accessories get damaged during fixing of the hardware and fittings, additional numbers as required shall be supplied by the Contractor at his own cost.

8.1.3. The size for the hardware and fittings shall be as specified in the item description in the schedule of quantities and the particular specifications. Wherever the size is not mentioned in the item nomenclature and particular specifications, it shall be as per the manufacturer's specifications or as directed by the PMC. The shape has been specified as per the model number mentioned in the manufacturer's product catalogue / information.

8.1.4. If the model number for an item is changed or modified or the item itself is changed / modified, during execution and / or during the defect liability period / guaranteeperiod, the decision of the PMC as to the equivalence of the item provided in the schedule of quantities shall be final and binding on the Contractor and no claimof any kind shall be entertained from the Contractor on this account. Nothing extra shall be payable on this account.

8.1.5. The Contractor shall be permitted to supply items superior than the item in the schedule of quantities, but only with specific written approval of the PMC , provided they are aesthetically similar and nothing extra shall be payable on this account. That the product proposed to be supplied by the Contractor is superior than that provided in the schedule of quantities / product supplied, shall be the sole discretion of the PMC and his decision shall be final and binding on the Contractor and no claim of any kind shall be entertained from the Contractor on this account.

8.1.6. The entire supply for each type of hardware and fittings shall be made, preferably, in one lot to keep variations in finishes to the minimum.

8.1.7. Three samples from each lot of each hardware shall be tested for conformity to the required grade. Samples shall be supplied by the agency free of cost. Testing charges shall be borne by the contractor.

8.2. Handles

8.2.1. All the Door handles shall be of the same type (model and finish) and make unless specifically permitted in writing by the PMC.

8.2.2. The handles shall be of stainless-steel grade as specified under item description.

8.2.3. The handles shall be supplied in required finish as directed by PMC forwhich nothing extra shall be paid.

8.3. Mortise latch, mortise dead bolt, mortise latch cum lock, lock with keys, escutcheon

8.3.1. The mortise latch, mortise dead bolt, mortise latch cum lock, lock with keys and escutcheon shall be of approved same make.

8.3.2. The locks and accessories shall be supplied as per item description.

8.3.3. The strike plate and for end plate shall be brush finish stainless steel of grade SS 304. Nothing extra shall be payable for supplying stainless steel grade SS 316 instead of SS 304 specified.

8.3.4. The cylinder escutcheons (key hole covers) shall be of stainless steel grade SS 304. These shall be supplied along with the key cylinder lock and shall not be measured separately for payment. Nothing extra shall be payable for supplying stainless steel grade SS 316 instead of SS 304 specified.

8.3.5. The inner part of the lock shall be made up of brass and not of zinic.

8.3.6. The lock shall be supplied with a set of three keys.

8.4. Floor spring: The floor spring of approved make shall conform to the following parameters:

S.No.	Attributes	Range
1	Mechanism	As per manufacturer's specifications
2	Maximum door width	≤1100 mm
3	Maximum door weight	Minimum 120 kg
4	Spring strength (EN)	1 - 4
5	Back check	Mechanical
6	Closing speed	Two Independent Speed Adjustment Valves - (175° – 15°) and (15°- 0°)
7	Hold open Function feature	At 90°
8	Internal components of floor Spring	Stainless steel precision manufactured
9	Cover plate	Stainless steel SS grade 304, secured to the floor spring body using stainless steel screws of SS 304 grade.
10	Non handed	Should be suitable for single and double action doors

8.5. Surface door closer : The surface door closer of approved make shall conform to the following parameters:

8.5.1. Surface door closer -

S. No.	Attributes	Range
1	Mechanism	As per manufacturer's specifications
2	Maximum door width	1100 mm
3	Closing force as per EN	2 – 4
4	Non-handed	Feature needed
5	Two Independent Speed Adjustment for variable closing and latching speed	Two Independent Speed Adjustments, (180° – 15°) and speed (15°- 0°).

9. Modular cubicles

9.1. The contractor shall procure the modular cubicles from one of the approved manufacturers / authorized dealers as mentioned in the list of approved makes for thisitem.

9.2. Samples of the modular cubicles, along with two sample toilets, shall be prepared comprising of partitions with intermediate panels, pilaster, door, all accessories and hardware as specified below, for the approval of the PMC before takingup mass work.

9.3. Each of the modular cubicle shall be as under:

9.3.1. Size of cubicle -As per specified by PMC. The overall height of the cubicleshall vary depending upon the site condition and as directed by PMC.

9.3.2. Door size – suitable (width) x height to suit the overall height of the cubicle.

9.3.3. All the partition of cubicle toilet such as intermediate panel, pilaster and door shall be made minimum 12mm thick solid compact laminate (Phenolic Core Board) of specified thickness by PMC conforming to IS: 2046 with chamfered edges. Top surface on both sides shall be Melamine coated.

9.3.4. Solid compact laminate shall be made by thermosetting resins homogeneously reinforced with cellulose fibers. Total volatile organic content (toc) of Compact laminate shall be less than 0.25mg /m3 and it shall conform to BS: 476 class I test for Fire.

9.3.5. Intermediate panel shall be continuous panel without any joint.

9.4. Each cubicle partition shall comprise of following accessories / hardware:

9.4.1. SS 304 grade "U" Channel for fixing intermediate panels with wall.

9.4.2. SS 304 grade "Top Rail" to be provided at the top of pilasters.

9.4.3. SS 316 grade adjustable foot at bottom. The height and number of adjustable foot shall be as per manufacturer's specifications and as per the directions of PMC.

9.4.4. 1 no. SS 304 grade Coat Hook.

9.4.5. 1 no. Alloy Privacy Thumb turn with Occupancy Indicator

9.4.6. 3 no. (min.) SS 304 Gravity hinges with cover plate for each shutter. Size of hinges to be as per manufacturer's specifications.

9.4.7. Rubber lining for groove as per manufacturer's specifications.

9.4.8. SS 304 grade Door Knobs of required size and numbers as manufacturer specifications.

9.4.9. S. S. Screws of grade 304 & P.V.C Wall Plugs, as per requirement of the work and as per manufacturer's specifications.

9.4.10. Any other accessories to complete the work in all respects as per manufacturer's specifications.

9.5. The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per the manufacturer's specifications, with each lot of material received at site.

9.6. For the purpose of measurement, number of modular cubicles of specified dimensions shall be enumerated.

10. Particular Specifications for Stainless Steel Works

10.1. Stainless steel work

10.1.1. The work under this sub-head in general shall be carried out as per the CPWD Specifications.

10.1.2. The scope of the work includes preparation of the shop drawings (based on the architectural drawings), fabrication, supply, installation and protection of the stainless steel work till completion and handing over of the work.

10.1.3. The stainless-steel pipes (minimum thickness 1.2 mm), channels, plates etc. Shall be of grade 304 and procured from the manufacturers per list of preferred makes given in this tender document. It shall be pre straightened without any dents, waviness, scratches, stains etc. And shall confirm the relevant clauses associated with this gradeof steel.

10.1.4. Based on the samples approved by the PMC, the contractor shall prepare mock up (one no.) At site of work, for approval of quality of workmanship. If the quality of the workmanship and the material is as per the required standards and approved by the PMC, the mock up shall be allowed as part of the work and measured for payment. Otherwise, it shall be dismantled by the contractor and taken away from the site of the work at his own cost. The mock up(s) so made shall be kept till completion of respective works for reference. Nothing extra shall be payable on this account.

10.1.5. One test (three specimens) for each lot shall be conducted for the stainless steel sheet in the approved laboratory. Therefore, the material shall preferably be procured in one lot from one manufacturer. If the test fails, the entire lot of material shall be rejected and shall be replaced by the Contractor at his own cost. The cost of the sample shall be borne by the Contractor.

10.1.6. The finished surface shall be free of any defects like dents, waviness, scratches, stains etc. And shall have uniform finish as directed by PMC. Any defective work shall be rejected and redone by the contractor at his own cost. The finished surface shall therefore be protected using protective tape which shall be removed atthe time of completion of the work. The surface shall then be suitably cleaned using non-abrasive approved cleaner for the material. Nothing extra shall be payable on this account.

11. Particular Specifications for Flooring & Dado / Cladding

11.1. General (applicable for all kinds of flooring and dado / cladding works under this sub-head):

11.1.1. The work under this sub-head in general shall be carried out as per the CPWD Specifications, as per the architectural drawings and as per the direction of PMC.

11.1.2. The PMC or his representative may, if required, visit the source of supply of the various stones to assess the quality as well as availability of the material in the required quantities. The Department shall bear the cost of such visits of the officers of the Department.

11.1.3. Based on the samples approved by the PMC for various flooring and dado / cladding materials as specified hereinafter, the contractor shall prepare mock up(s) at site of work as specified under relevant flooring and dado / cladding items, for approval of quality of workmanship and material specified. If the quality of the workmanship and the material is as per the required standards and approved by the PMC, the mock up shall be allowed as part of the work and measured for payment. Otherwise, it shall be dismantled by the contractor as directed by the PMC and taken away from the site of the work at his own cost. The mock up(s) so made shall be kept till completion of respective works for reference. Nothing extra shall be payable on this account.

11.1.4. The stones / tiles shall be transported to site well packed in boxes or otherwise. These shall be handled carefully to prevent any damage. The various types of stones and tiles, procured shall be free of any surface defect or any edge damage. The damaged stones and tiles shall not be allowed to be used in the work. So, the contactor shall procure additional quantity of the stone and tiles to cover such contingencies. However, nothing extra shall be payable on this account.

11.1.5. For the enclosures with circular or curved profile, only the actual area of the flooring shall be measured for payment and nothing extra shall be payable for labour, material, wastages and any other incidental charges.

11.1.6. For the skirting in the enclosures with curvilinear profiles, the tiles / stones shall be cut to the required size and the shape to match the profile and/ or the joints as per the architectural drawings. Similarly, the skirting shall be fixed in a manner as to flush or project from the finished face of the wall as per the architectural drawings and as directed by the Engineer – in – Charge. Any chasing of the C.C masonry blocks required for such fixing is deemed to be included in the cost of masonry. Nothing extra shall be payable on this account.

11.1.7. For flooring work, the joints between the different types of flooring shall be located as per the architectural drawings and the measurement shall be done as per item description. Also, the Contractor shall maintain the uniform level of the finished

flooring of the different types unless specifically mentioned on the architectural drawings. Nothing extra shall be payable on these accounts.

11.1.8. All the flooring works specified under this sub-head shall be adequately protected by a layer of plaster of is which shall be laid over a 400 micron PVC film. The protective layer shall be maintained throughout the execution of works and removed just before handing over of the site for which nothing extra shall be payable.

11.1.9. At the time of handing over, flooring & dado / cladding shall be free of any scratches, stains etc. The flooring & dado / cladding shall be properly cleaned before handing over. However, abrasive cleaners shall not be used to clean the marks and other scratches.

11.2. Kota stone work

11.2.1. The Contractor shall procure and submit the samples of the kota stone for flooring as well as risers and treads in the staircase, for the approval of the PMC prior to the execution of the item.

11.2.2. Mock up (one no.) Shall be prepared for staircase (tread as well as riser).

11.2.3. All the Kota stones shall have uniform colour and shade. So, the entire quantity shall be obtained, preferably, in one lot from one location (in one quarry) to keep variation to the minimum. The Contractor shall also sort, segregate and use the stone slabs, according to colour, shade, etc. At any one location to keep variation in the colour, shade etc. In stones used to the minimum. Any stone slab with a variation, not acceptable to the PMC, shall not be used in the work and shall be removed and replaced by the Contractor at his own cost. Nothing extra shall be payableon these accounts. Also, no claim of any kind shall be entertained from the Contractor on this account.

11.2.4. The exposed cut edges of the Kota Stone slab in risers and treads along its width (sides of the risers and treads of the steps i.e. Along the shorter dimensions of the kota stone slab for the risers and treads) shall be polished in a workmanlike manner. The top exposed edge of the kota stone skirting shall also be polished in a workmanlike manner. Nothing extra shall be payable on this account.

11.2.5. Nosing / edge moulding shall be provided to the front edge of the Kota stone slab treads along its length i.e. Along the longer dimensions of the kota stone slab, as per the architectural drawings. The payment of the same shall be made separately under relevant item.

11.3. Granite stone work:

11.3.1. The Contractor shall procure and submit the samples of different types of granitestones, for the approval of the PMC prior to the execution of the item.

11.3.2. The mock up (one each) shall be prepared in staircase, amphitheatre, stilt of academic block, dining area, etc.

11.3.3. The entire supply for each type of granite stone slab shall be procured from one location (in one quarry), and supplied preferably, in one lot to keep variations to the minimum. The Contractor shall also segregate and sort the slabs according to colour, shade, texture and size of grains etc. To keep variation(s) in stones used at any one location to the minimum. Any slab with variation in the colour, shade, texture and size of grains etc., not acceptable to the PMC, shall not be used in the work and shall be removed and replaced by the Contractor. Nothing extra shall be payable on these accounts. Also, no claim of any kind shall be entertained from the Contractor on this account.

11.3.4. Granite stone slabs shall be pre polished (mirror polished) or given any other surface treatment as specified in the item nomenclature, as per the Architectural drawings and as directed by the PMC.

11.3.5. Machine polishing and cutting to required size shall be done with water (as lubricant) only. Sawing shall also be done preferably with water as lubricant but as a special case, the PMC may permit, at his discretion, oil or kerosene as lubricant subject to all kerosene or oil in the body and surface of tiles / slabs being thoroughly dried in ovens. Tiles / slabs with stains or patches due to the use of oil or otherwise, either before or after installation, shall be rejected and shall be replaced by the Contractor at his own cost. Nothing extra shall be payable on this account.

11.3.6. The stone work may be required to be carried out in patterns, design and / or in combination with granite stones of different colour and shade with or without borders and in combination of different stone slabs / tiles for which nothing extra shall be payable. The stones shall be provided in sizes and shapes as per the architectural drawings and wastages and incidental costs, if any, shall be deemed to be covered in the cost of the relevant items. Nothing extra shall be payable on this account.

11.3.7. For the flooring portions curved in plan, the stone slabs (at the edge) shall be cut to the required profile and shape as per the architectural drawings. Nothing extra shall be payable on this account and any consequent wastages and incidental charges on such accounts shall be deemed to be included in the cost of such items. For the purpose of payment, the actual area of granite stone shall be measured separately as specified under the relevant items.

11.3.8. The granite slabs used for providing and fixing in the sills, soffits and jambs of doors, windows, ventilators and similar locations shall be in single piece unless otherwise directed by the PMC. Wherever stone slab other than in single piece is allowed to be fixed, the joints shall be provided as per the architectural drawings and as per the directions of the PMC. In the cabin areas, the joints in sills shall preferably be provided in line with the partition wall. Depending on the numberof joints, as far as possible, the stone slabs shall be procured and fixed in slabs of equal lengths as per the architectural drawings and as directed by PMC.

11.3.9. The specifications for dressing, laying, curing, finishing, measurements, rate etc. For the granite stone flooring shall be same as that of works for the Marble flooring,skirting and risers of steps under Flooring Sub Head of the CPWD Specifications. The wall lining / veneer work with granite stone shall be as per the CPWD Specifications for Marble work Sub Head.

11.4. Vitrified and ceramic tiles work

11.4.1. The contractor shall procure and submit the samples of approved make, shade and thickness of different types of vitrified and ceramic tiles, for the approval of the PMC prior to the execution of the item.

11.4.2. The mock up (one each) shall be prepared for flooring and dado, for vitrified tiles etc.

11.4.3. The entire supply for each type of tiles shall be procured from one manufacturer / authorized dealer, preferably, in one lot to keep variations to the minimum.

11.4.4. The tiling work may be required to be carried out in patterns, design and / or in combination with tiles of different colour and shade and in combination of different stone slabs / tiles for which nothing extra shall be payable. The tiles shall be provided as per the architectural drawings and wastages and incidental costs, if any, shall be deemed to be covered in the cost of the relevant items. Nothing extra shall be payable on this account.

11.4.5. For the flooring portions curved in plan, the tiles (at the edge) shall be cut to the required profile and shape as per the architectural drawings. Nothing extra shall be payable on this account and any consequent wastages and incidental charges on such accounts shall be deemed to be included in the cost of such items.

11.4.6. The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per the manufacturer's specifications, with each lot of material received at site.

11.4.7. The flooring and dado / cladding should be set out such that the perimeter/ corner tiles are in excess of half a tile so that the edge panels on both the sides are of equal sizes, as far as possible. The tiles shall be cut to required size and shape in a workman like manner but with all precautions, as per the manufacturer's specifications.

11.4.8. For dado / cladding / skirting work, the tiles shall be chamfered at the meeting edges on the corners in a manner that butt edges are not visible. It shall be ensured that the edges shall be ground / filed to chamfer the edges so that the glazing layer at the edges of the tiles is not chipped off otherwise the work shall be rejected and redone by the Contractor at his own cost.

11.5. PVC sports flooring

11.5.1. The Contractor shall procure and submit the samples of approved make, shade and thickness of PVC sports flooring material along with accessories and adhesives proposed to be used as per the manufacturer's recommendations, for the approval of the PMC prior to execution of the item.

11.5.2. Once the material is approved, the entire material for PVC sports flooring shall be procured from one of the approved manufacturers / authorized dealers preferably, in one lot to keep variations to the minimum. The contractor shall also procure various accessories and adhesive required for satisfactory installation of PVC sports flooring.

11.5.3. The work shall be carried out as per the architectural drawings, as per site conditions and as per the directions of the PMC. The work shall be carried out in design and pattern including in combination with PVC sheets / tiles of different colours and shade in linear as well as curvilinear portions of the building, as per the architectural drawings. The joints shall be kept as minimum as possible.

11.5.4. The work shall be carried out as per the manufacturer's specifications. The work shall be got executed through an experienced agency executing similar works.

11.5.5. Before fixing the PVC sports flooring, it shall be ensured that the sub floor on which the PVC sports flooring is being laid is smooth, flat, hard & free from moisture, grease, etc. In case of uneven sub floor, the same shall be levelled by self-levelling compound at no extra cost to the Department. The PVC sports flooring shall have perfect level after laying and no undulations from the sub-base shall be visible (reflected) on the surface. Also, there shall not be any air bubbles or de-lamination of the flooring, otherwise the work shall be rejected and redone by the Contractor at his own cost.

11.5.6. Care shall also be taken to ensure that sub floor is dry at the time of installation.

11.5.7. The composite thickness of the PVC flooring sheet shall be as per item description.

11.5.8. All the joints shall be sealed by hot welding as recommended by the manufacturer to make the floor seamless and safe.

11.5.9. The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per relevant EN standards, with each lot of material received at site.

11.5.10. For the purpose of measurement, the actual area of PVC sports flooring includingskirting provided and fixed in position shall be considered.

11.6. Glass mosaic work in flooring and dado: -

11.6.1. The Contractor shall procure and submit the samples of approved make, shade and thickness of different types of glass mosaic tiles, for the approval of the PMC prior to the execution of the item.

11.6.2. The mock up (one each) shall be prepared for swimming pool and water body.

11.6.3. The entire supply for each type of glass mosaic tiles shall be procured from one manufacturer / authorized dealer, preferably, in one lot to keep variations to the minimum.

11.6.4. The work shall be carried out in patterns and designs in combination of tiles of different colours and shades, fixed in linear as well as curvilinear profile, as per the architectural drawings, as per the site conditions and as per the directions of Engineer–in–Charge.

11.6.5. Before fixing the glass mosaic tiles on the surface, the surface shall be cleaned properly. Thereafter, the glass mosaic tiles shall be fixed with adhesive of approved make as per manufacturer's specifications including grouting the joints with adhesiveof required colour and shade. The tiles in the required pattern shall be laid with random mix of tiles of approved make and series, as per the architectural drawings andas per the directions of PMC.

11.6.6. The work shall be carried out as per the manufacturer's specifications. The work shall be got executed through an experienced agency executing similar works.

11.6.7. The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per the manufacturer's specifications, with each lot of material received at site.

11.6.8. For the purpose of payment, actual area of the glass mosaic tiles work shall be measured in sqm correct to two decimal places. No deduction shall be made for joint width between the adjacent tiles.

11.7. Crazy ceramic (China mosaic) tile flooring):

11.7.1. The materials to be used shall be broken glazed ceramic tile pieces. These shall be obtained from broken glazed tiles of uniform thickness and of approved shade and manufacture and conforming to I.S. 13753. The tile pieces shall be hard, sound, dense and glossy in texture. These shall be of required colour and shade and free from stains, cracks, decay and weathering.

11.7.2. The work shall be carried out as per the architectural drawings in design (geometric, abstract etc.) And in linear and / or curvilinear pattern and in combination with tile pieces of different colour and shade

11.7.3. Before laying tile flooring on RCC slabs / PCC base, the laitance shall be removed and the surface shall be roughened. A coat of cement slurry @ 2.2 kg of cement per sqm shall be applied over the base surface for bonding between RCC slab / PCC and mortar bedding of tile flooring. Nothing extra shall be payable on this account.

11.7.4. Pieces of ceramic glazed shall be brought to required size & shape to achieve the required design/ pattern. The shade of the tiles shall also be selected depending upon the pattern/ design. Tiles shall be thoroughly cleaned and soaked in water before fixing. Cement grout of desired consistency admixed with approved water-proofing compound and synthetic polyester fibre shall be spread over the mortar bedding when the mortar is still plastic. Pieces of glazed tile shall be pressed piece by piece in the required pattern in the cement float. The fixing shall be done by keeping the joints between the pieces as thin as possible but not exceeding 5mm. The work shall be carried out to correct level and slopes and compacted by striking the surface with hand thappies and straight screed tamper. The grout shall cream up to the surface. The junctions of the flooring and the parapet wall shall be rounded and the flooring shall be extended upto the wall for 15cm or as specified. After the flooring has been laid or the day's fixing work is completed, surplus cement grout that may have come out of the joints on compacting shall be cleaned off. The flooring laid shall be kept moist and allowed to mature undisturbed for 10 days to allow the bedding and flooring to set properly.

11.7.5. Once the floor has set, it shall be carefully washed clean and dried. When dry, the floor shall be covered with oil free dry saw dust which shall be removed only after the construction work is completed.

11.7.6. The Contractor shall ensure that the China Mosaic work provides waterproofing treatment and shall not allow penetration of water. The guarantee for the water proofing work at the terrace shall also include restoration of the China Mosaic work after rectification, if any to the integral cement based waterproofing treatment to the terrace. Nothing extra shall be payable on this account.

11.7.7. For the purpose of payment, actual area of the China Mosaic tile work shall be measured in sqm correct to two decimal places. No deduction shall be made for joint width between the adjacent tile pieces.

11.8. Composite marble:

11.8.1. The Contractor shall procure and submit samples of approved make, shade and thickness of composite marble slab, for the approval of the PMC prior to the execution of the work.

11.8.2. The mock up (one each) shall be prepared for flooring and dado / cladding work

11.8.3. The entire supply of composite marble shall be procured from one supplier/ manufacturer only, preferably, in one lot to keep variations to the minimum.

11.8.4. The size of the stones shall be as per the architectural drawings.

11.8.5. The composite marble used in the sills, soffits and jambs of doors, windows, ventilators and similar locations shall be in single piece unless otherwise directed by the PMC. Wherever slab other than in single piece is allowed to be fixed, the joints shall be provided as per the architectural drawings and as per the directions of the PMC. Depending on the number of joints, as far as possible, the slabs shall be procured and fixed in slabs of equal lengths as per the architectural drawings and as directed by PMC.

11.8.6. One sample shall be tested for every 500 sqm or part thereof. However, minimum one sample shall be tested from each lot received at site even if the quantity procured in the lot is less than 500 sqm. If required, the PMC or his authorized representative shall inspect the factory during production and also collect samples from the factory itself. The contractor shall consider this contingency while placing the order with one of the approved firms. Nothing extra shall be paid on this account

11.8.7. The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per the manufacturer's specifications, with each lot of material received at site.

11.8.8. In addition, the samples of composite marble slabs shall be collected randomly from the lot procured and tested for various parameters specified below from any accredited laboratory as approved by the PMC. The composite marble shall conform to the technical specifications given below:

List of Tests				
S. No.	**Test**	**Standard of Test**	**Standard of Measurement**	**Passing Criteria**
4.8.1.	Water Absorption	EN99	%	Less than 0.3
4.8.2.	Surface Hardness	EN 101	Mohs Scale	3-4
4.8.3.	Density	ASTM C 97	Kg/Cum	>2200
4.8.4.	Compressive Strength	ASTM C 170	Mpa	>100
4.8.5.	Flexural Strength/ Modulus of Rupture	EN100	Kg/cm^2	>250

11.8.9. The work shall generally conform to relevant CPWD specifications. Following additional precautions shall be taken during execution of work for composite marble flooring/ platforms / dado / cladding etc.

11.8.10. A gap of 8-10mm shall be left between masonry wall & stone slab in flooring below skirting to take care of thermal expansion.

11.8.11. Only epoxy mixed with matching pigment shall be used for filling of joints of slabs in flooring / platforms / dado / cladding and other locations.

11.8.12. The final surface shall be polished to give uniform joint free mirror finish.

11.8.13. All the joints shall be protected with masking tape & left open for a period of 7-10 days for evaporation of excess moisture. The joints shall be properly cleaned before filling with epoxy grout.

11.8.14. For the purpose of measurement, CPWD Specifications shall be referred for respective items of marble work.

11.9. Wooden laminate flooring:

11.9.1. The Contractor shall procure and submit the samples of approved make, shade and thickness of laminate wooden flooring along with accessories, for the approval of the PMC prior to the execution of the item.

11.9.2. The flooring material shall be of class 23 / 32 HPL laminate flooring, intended for general commercial use. The composition of laminate wooden flooring shall be as under:

- Surface layer – high pressure laminate (HPL)
- Core material – high density fibre board (HDF)

11.9.3. The mock up (one no.) Shall be prepared for flooring in the academic block.

11.9.4. The entire supply for laminate wooden flooring shall be procured from one manufacturer / authorized dealer, preferably, in one lot to keep variations to the minimum. The contractor shall also procure various fittings and accessories like beading, flat profile, skirting, end profile, transition profile, reducer profile, stair

nosing, T profile etc. All complete required for satisfactory installation of the wooden laminate flooring.

11.9.5. The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per the manufacturer's specifications, with each lot of material received at site. The laminate wooden flooring material shall meet the following parameters:

S. No.	Test	Standard of Test	Passing Criteria
7.5.1	Abrasion resistance	EN 13329 Annex E	AC 4 or above
7.5.2	Impact resistance	EN 13329 Annex F	IC 2
7.5.3	Resistance to cigarette Burns	EN 438	Class 4
7.5.4	Effect of a furniture leg	EN 424	Foot type 0 no change or Damage
7.5.5	Effect of a castor chair	EN 425	25,000 revs soft wheels – no change or damage
7.5.6	Thickness swelling	EN 13329 – Annex G	≤18%
7.5.7	Dimension stability	EN 13329 – Annex C	≤0.9%
7.5.8	Surface soundness	EN 13329 – Annex D	≥1
7.5.9	Static indentation	EN 433	≤0.01mm

11.9.6. The work shall be carried out in patterns and designs in combination of differentcolours and shades, fixed in linear as well as curvilinear profile, as per the architectural drawings, as per the site conditions and as per the directions of Engineer – in – Charge.

11.9.7. The work shall be carried out as per the manufacturer's specifications. The work shall be got executed through an experienced agency executing similar works.

11.9.8. Before fixing the laminate wooden flooring, it shall be ensured that the sub floor on which the laminate wooden flooring is being laid is smooth, flat, hard & free from moisture, grease, etc. In case of uneven sub floor, the same shall be leveled by self-leveling compound at no extra cost to the Department. The laminate wooden flooring shall have perfect level after laying and no undulations from the sub-base shall be visible (reflected) on the surface. Also, there shall not be any air bubbles or delamination of the flooring, otherwise the work shall be rejected and redone by the Contractor at his own cost.

11.9.9. Care shall also be taken to ensure that sub floor is dry at the time of installation.

11.9.10. For the purpose of measurement, the actual area of laminate wooden flooring including skirting provided and fixed in position shall be considered.

11.10. EPDM flooring: manufacturer:

11.10.1. Polyurethane binder shall be mixed throughout the entire thickness.

11.10.2. Bevel is installed at the perimeter of the installation running from the thickness of the surface down to the base. The outside line of the bevel must be clear and follow the designed edge of the installation.

11.10.3. IMPORTANT NOTICE

It should be noted that EPDM coloured surface will appear to have a yellow tinge to the finish after installation. This is caused by the reaction urethane resin coating on the rubber granules when in contact with Ultra Violet light. This is a short-term reaction until the natural effects of fading occur as the curing process proceeds. This process of "burning back" to the natural colour occurs more quickly with outdoor surfaces. Taking approximately 14 days with direct sunlight.

11.10.4. QUALITY ASSURANCE

Installer shall have at least Five (5) years proven experience in the industry and approved by product manufacturer. Submit product samples in specific colour and specified thickness.

11.10.5. COLOURS:

FORTKOTE COLOURS (UV –Stable EPDM);Blue, Forest Green, Red, Beign, Yellow, Brown, Purple, Emerald Green, Teal and Black.

12. <u>Factory made Stainless-Steel Railings</u>

12.1. The work shall be carried out as per approved architectural drawings. The contractor shall arrange all materials, labour, tools, ladders, scaffolding and other equipment's necessary for the completion and protection of all stainless-steel work.

12.2. MATERIAL

The stainless-steel pipes (minimum thickness 1.2 mm), channels, plates etc. Shall be of grade 304 and procured from the manufacturers per list of preferred makes given in this tender document. It shall be pre straightened without any dents, waviness, scratches, stains etc. And shall confirm the relevant clauses associated with this gradeof steel.

12.3. Factory made Stainless Steel (grade 316) Knock Down railing system comprising Handrail containing high-grade Stainless-Steel Bushings at every Bend Joint of Railing to provide extra strength fixed by T- Bracket AISI 304 grade Stainless Steel Round baluster with the help of Handrail Clamping Screws. The baluster should be concealed by glossy finished cover cap Round Baluster with casted Base Plate Secured by Anchor Fasteners on Concrete Surface Floor and concealed with AISI 304 grade cover Gap. Hand rail, baluster and in-fill members should be of Satin/Matt finish of 320 grit done with minimum 3 time finishing process in automatic polishing machine to achieve smooth and long-lasting hairline finish. If any welding must be done at factory by

automatic welding machine in MIG or any approved process welding process with accurate precision so as no welding marks burrs are visible on products. Wall thickness of all pipes shall be taken as 1.2 mm.

12.4. The Contractor shall prepare the mock-up at site for approval of material and quality of workmanship by the PMC. Only after the approval of Mock-up, the Contractor shall start the mass work. If the quality of the workmanship and the material is as per the required standards and approved by the PMC, the mock up shall be allowed as part of the work. Otherwise, it shall be dismantled by the contractor and taken away from the site of the work at his own cost.

12.5. Any incidental additional requirements for execution of this item to the satisfaction of PMC shall also be deemed to be included in the item and shown in attached drawing and nothing extra will be paid for such extra work.

13. <u>Particular Specifications for Monolithic Aluminium formwork shuttering:</u>

13.1. Aluminium formwork should be designed and customized as per requirement of architectural/structural /services drawings.

13.2. The Contractor shall submit the good for construction drawing and MEP drawing to the manufacturer. The contractor /manufacturer shall then prepare the shop drawing based on architectural and MEP drawing for approval of Engineer in charge. The contractor /manufacturer shall also submit the method statement for carrying out the work in concurrence with the milestones defined in the agreement. Based on the approval contractor shall immediately procure minimum quantity of shuttering given elsewhere in the NIT. The minimum quantity (i.e12895) given is indicative as a guideline, contractor if desired may procure additional shuttering material for completing the project on time, for which nothing shall be paid extra.

13.3. The Agency/manufacturer of aluminium form work shall submit 3d modelling and virtual reality model of one sample flat, if demanded by E IN C.

13.4. The contractor in coordination with the aluminium form work shuttering manufacturer shall submit the method statement for safety work working at higher floors for approval of Engineer in charge.

13.5. The contractor shall provide vertical dense safety net and horizontal safety net with necessary bracing and framework to support the safety net.

13.6. The aluminium form work shall confirm to IS:14687-1999 and execution shall be as per CPWD specification.

13.7. Material

13.7.1. Aluminium panel sheet shall be minimum 4mm thick using grade of 5052.

13.7.2. Aluminium for extrusion section shall be of grade 6061 (type 6).

13.7.3. Pin and wedges shall be of high-grade mild steel.

13.8. Contractors must order sufficient quantity of form work, its accessories, hardware and related items as mentioned in NIT to complete the project in time. It is advisable to order extra accessories and hardware to avoid site delays.A mock-up of Aluminium form work shall be examined by the PMC at the factory location, if required. Contractor in coordination with manufacturer shall provide assistance for visit.

13.9. Lubricants for the form work shall be got approved from E IN C and must be applied as per manufacturer guidelines.

13.10. De-shuttering and stocking for form work must be done as per manufacturer guidelines.

13.11. Manufacturer of aluminium formwork will provide minimum two Supervisors/Shuttering Experts to execute the work under their supervision, provide training and assistance to workers for entire period of RCC casting. These Supervisors will provide training to workers in regard of erection of shuttering, conduiting, plumbing, casting of RCC, de-shuttering, stacking of shuttering material, oiling, lubricating etc.

13.12. Since the finishing of concrete has the biggest role in the final finished product, it is mandatory to achieve the finish up to the satisfaction of the Architect/ PMC.

13.13. For core cutting /sealing of joint/the gap left out between pipes, conduits and concrete surface shall be filled with approved material (non-shrink grout) for taking out of sanitary/ water supply/ firefighting cables, pipes etc. If any nothing extra shall be paid.

13.14. Aluminium formwork should be handled carefully by trained labour of manufacturer or contractor.

13.15. Manufacturer of Aluminium formwork will submit certificate in every six months through contractor to PMC ensuring that formwork is fit for achieving good quality concrete work in all respect. Agency has to remove defective aluminium formwork from site promptly.

13.16. Holes made for fixing arrangement of formwork shall, brackets shall be sealed with non-shrink grout of approved make by contractor without any additional cost.

13.17. Tolerance: - Tolerance in finished panel shall be (- 1 mm).

13.18. The undulation at joints of panels in the finished surface of concrete shall be grinded to the flush with adjacent panel, before finishing is taken up. Nothing Shall be paid extra on account of same.

13.19. The safety precaution required at periphery of the building and brackets to used at the periphery of the building for working at periphery should be sturdy and is included in the cost of the aluminium shuttering work. Nothing shall be paid to the contractor on this account.

14. Particular Specifications – Finishing

14.1. General (applicable for all items under this sub-head)

The work shall in general be carried out as per the CPWD specifications and the manufacturer's specifications (where CPWD specifications are not available).
The theoretical consumptions of the various materials like plaster, primer, paint, etc. Shall be as per the CPWD specifications and the various coefficients specified herein.

Wherever coefficients are not mentioned in CPWD specifications, the same shall be as specified under relevant items. Nothing extra shall be payable on account of actual consumption exceeding the theoretical consumption. However, in exceptional cases, if the actual consumption is lesser than the theoretical consumption, cost adjustment shall be made for lesser consumption of material at the prevailing market rate.

14.2. The concrete surface on which ready mix plaster, gypsum, putty, texture plaster is to be applied shall be properly hacked or the bonding coat of approved make shall be applied to the concrete surface for which nothing shall be paid extra.

14.3. Ready Mixed Cement Plaster

14.3.1. General

a. The Ready-Mix plaster shall have minimum 30% replacement of OPC with BIS recommended waste by weight of cement**.** The agency shall submit the third-party test report for the same. **(As per GRIHA criterion 19.1.4).**

b. The quantity of plaster required as per the theoretical consumption including wastages, if any, shall be procured from one of the approved manufacturers or his authorized dealers.

c. The plaster shall be obtained in packing (40 Kg or 50 Kg, as per manufacturer) as far as possible.

d. The name of the manufacturer, manufacturer's product identification, and manufacturer's

mixing instructions, warnings and instructions for handling and application, date of manufacturing and shelf life shall be clearly and legibly mentioned on the labels of each bag. These details shall be kept in record. The material shall be consumed in the order of material brought to site, first come first consume basis. The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per the manufacturer's specifications, with each lot of material received at site.

e. The method of storage of material shall be same as applicable for cement specifications. The material older than 6 months from the date of manufacturing shall not be allowed to be used in the work.

14.3.2. **Surface preparation-** The base surface shall be cured properly prior to the application of plaster. It shall be cleaned thoroughly, with no loose particles or dust. The surface shall be structurally sound, clean and free from dirt, oil, grease, efflorescence or any other contaminant that could impair the natural bond. Surface defects such as cracks, holes or voids shall be repaired prior to application. The base surface shall also be in- line & leveled before the application of plaster.

14.3.3. **Pre-wetting of the substrate**- The surface shall be wet properly before application of plaster.

14.3.4. Mixing:

i. Plaster shall be thoroughly mixed with water before use in a mechanical stirrer for uniform and through mixing to ensure proper workability

ii. Mixing ratio of clean potable water to the weight of the powder shall be as per manufacturer's specifications, depending upon the thickness of the plaster to be applied.

iii. The entire plaster proposed to be used in specific work shall be mixed thoroughly and uniformly with water. No plaster shall be left unmixed in the container.

iv. In exceptional cases, manual mixing shall be allowed with prior approval of Engineer – in-Charge. However, it shall be ensured that the plaster is mixed uniformly during manual mixing.

v. All arrangements for measuring, dosing etc. At site shall be made by the Contractor.

14.3.5. Application:

i. Plaster shall be applied on the surface manually with a trowel.

ii. The first coat of mixed plaster will be applied on the moistened wall surface uniformly, going upward from the bottom.

iii. The thickness of the coating to be applied shall be as per the manufacturer's specifications.

iv. The first coat of the plastered surface shall be allowed to dry as per manufacturer's

specifications before applying second coat. The surface after second coat shall be allowed to dry completely and same process shall be followed for subsequent coats.

v. The curing shall be done as per manufacturer's specifications.

vi. The entire quantity of plaster shall be used within 2 to 3 hours or as per manufacturer's specifications, after mixing with water. No extra water shall be addedin the mixture made.

vii. For application in exterior surfaces, necessary measures like covering the surface with net and water curing as per manufacturer's specification shall be undertaken.

14.3.6. Coverage:

i. The coverage for 12 mm thick plaster shall be 29 Kg per sqm or as per manufacturers specification.

ii. The coverage for 6 mm thick plaster shall be 14.5Kg per sqm or as per manufacturers specification.

iii. The coverage for 18 mm thick plaster shall be 43.5 Kg per sqm. or as per manufacturers specification.

iv. The coverage for 15 mm thick plaster shall be 36.25 Kg per sqm. or as per manufacturers specification.
The contractor shall maintain proper records for receipt and consumption of the plaster for verification of Engineer-in – Charge.

14.3.7. **Measurement**- The mode of measurement shall be as per cement plaster items of respective thicknesses as per CPWD specifications 2021.

14.4. Paint/ primer/putty/ sealeants

14.4.1. All interior wall, ceiling finishes such as primers, paints putty etc shall have low VOC content and shall be lead free (GRIHA criterion 12.1.4)

14.4.2. All paints used shall satisfy below mentioned VOC limits

Paint Application	Type of Finish	VOC Limit (g/L)
Interior coatings	Flat	< 50
	Non-flat	< 150
Exterior coatings	Flat	< 200
	Non-flat	< 100
Anti-corrosive	Gloss/semi-gloss/flat	< 250

14.5. Acrylic texture plaster

14.5.1. The Contractor shall procure and submit the samples of approved make and shade along with catalogue, for the approval of the PMC prior to execution of the item.

14.5.2. Based on the samples approved by the PMC, the contractor shall

prepare the mock-up at site for approval of material and quality of workmanship by the PMC. Only after the approval of mock-up, the contractor shall start the mass work. The mock-up shall not form part of the work. The mock up(s) so made shall be kept till completion of respective works for reference. Nothing extra shall be payable on this account.

14.5.3. Once the material and mock up are approved, the entire quantity of various materials shall be procured from the approved manufacturer or its authorized dealer, preferably, in one lot to keep variations to the minimum.

14.5.4. The work shall be carried out as per the manufacturer's specifications.

The contractor shall obtain and submit to the Department the manufacturer's test certificate / report for compliance of the material to the relevant standards alongwith each lot of material supplied for the work.

14.5.5. The material shall consist of two parts: Scratch-plaster and Terra-coat.

i. Scratch-plaster - It shall have two components which comes in liquid & powder form. These shall be mixed at site before application in the ratio 25kg. Powder in 1.0 litre of liquid. Powder shall be made-up of Acrylic powder polymer , inert filler material in powder form, finally graded silica (450 micron to 1.00mm graded) particles, Anti-fungal agents, Emulsifying agent (Extender) to prevent lumping of powder during mixing, Titanium di-oxide pigments for making it water-proof from exterior while allowing trapped water vapour breathability & Thixotropic agent for maintaining consistency of mix. & to prevent flowing of mix during application. The surface to be covered shall be pre-cured & shall be applied with surface stabilization primer before application of Scratch-plaster.

ii. Terra-coat - It shall be made-up of Acrylic Co-polymer emulsion, crushed & precisely graded silica particles (500 micron & down size), high quality rutile (Purest form) grade Titanium di-oxide, fungicide, plasticizers & anti-corrosive agent This shall be applied over scratch-plaster in two or more coats to get approved shade & pattern.

15. <u>Particular Specifications – Road work</u>

15.1. General (applicable for all items under this sub-head)

The work under this sub-head in general shall be carried out as per the CPWD specifications, as per architectural drawings and as per directions of PMC.

15.2. Tiles, paver block and kerb stone

15.2.1. The Paver block shall contain minimum 10% C& D waste content by weight of block. The agency shall submit relevant documents as per GRIHA confirming the compliance. **(As per GRIHA criterion 21.1.1).**

15.2.2. Kerb stone used at site shall have concrete used with minimum 30% fly ash content by weight of total cementitious material. The agency shall submit relevant documents as per GRIHA confirming the compliance **(As per GRIHA criterion 21.1.2).**

15.2.3. The work under this sub-head in general shall be carried out as per the CPWD specifications, as per the manufacturer's specifications, as per architectural drawings and as per directions of PMC.

15.2.4. The Contractor shall procure and submit the samples of approved make, shade and thickness of various materials (tiles and paver blocks etc.) Along with catalogue, for the approval of the PMC prior to execution of the item.

15.2.5. Based on the samples approved by the Consultant architect for various tiles and paver blocks etc. the contractor shall prepare the mock-up at site for approval of material and quality of workmanship by the Consultant architect. Only after the approval of mock-up, the contractor shall start the mass work. If the quality of the workmanship and the material is as per the required standards and approved by the PMC, the mock up shall be allowed as part of the work and measured for payment. Otherwise, it shall be dismantled by the contractor as directed by the PMC and taken away from the site of the work at his own cost. The mock up(s) so made shall be kepttill completion of respective works for reference. Nothing extra shall be payable on this account.

15.2.6. Once the material and mock up are approved, the entire quantity of various materials shall be procured from the approved manufacturer or its authorized dealer, preferably, in one lot to keep variations to the minimum.

15.2.7. The material (tile and paver blocks etc.) Shall be supplied at site only after attainment of required strength at the factory itself.

15.2.8. The PMC or his representative may, if required, shall inspect the factory during production of various tiles to assess the quality of the material and also collect samples from the factory itself. The Department shall bear the cost of such visits of the officers of the Department.

15.2.9. The material shall be transported to site well packed. These shall be handled carefully to prevent any damages. The material procured shall be free of any surface defect, edge damage and any other such defects. The defective / damaged material shall not be allowed to be used in the work. So, the contactor shall procure additional quantity of material to cover such contingencies. However, nothing extra shall be payable on this account.

15.2.10. Adequate care for various materials shall be taken before fixing as well as afterwards till completion of the work. It shall be protected from rains, excessive humidity,

chemical fumes, vibrations, dust etc. The contractor shall ensure careful handling and storage and prevent any rough handling, to prevent any edge damage or breakage. Any material (tiles and paver blocks etc.) With edge damaged or crack etc. Shall not be allowed to be used in the work and shall be replaced by the contractor at his own cost. Similarly, adequate care shall be taken by the contractor while placing or removing and handling the material so as not to cause any damage. The finished work shall becleaned as per manufacturer's specifications. Abrasive cleaners shall not be used to clean the marks.

15.2.11. The work shall be carried out as per the manufacturer's specifications.

The tiles and paver blocks shall be fixed in required pattern and design in combination with tiles / paver blocks of different colours and shades in linear or curvilinear pattern as per the architectural drawings and the site conditions.

i. The contractor shall obtain and submit to the Department the manufacturer's test certificate / report for compliance of the material to the relevant standards alongwith each lot of material supplied for the work.

ii. For the enclosures with circular or curved profile, only the actual area of the respective works shall be measured under relevant sub-heads for payment and nothing extra shall be payable for labour, material, wastages and any other incidental charges.

iii. For tiling and paver work, the joints between the different types of tiles and pavers shall be located as per the architectural drawings and the measurement shall be done as per item description.

iv. The Contractor shall maintain the uniform level of the finished flooring of the different types unless specifically mentioned on the architectural drawings.

v. At the time of handing over, the finished areas (tiles and paver blocks etc.) shall be free of any scratches, stains etc. These areas shall be properly cleaned before handing over. However, abrasive cleaners shall not be used to clean the marks and other scratches.

16. Particular specifications for sanitary installations, water supply & drainage

16.1. General (applicable for items under this sub-head):

i. The work under this sub-head in general shall be carried out as per the CPWD specifications, as per architectural drawings and as per directions of PMC.

ii. All Santitary and Water supply fixture shall be as per GRIHA confirming compliance and shall reduce the water reduction from GRIHA base case by more than 20%, so that target of 2 points is achieved for GRIHA criterion 13.1. In doing so contractor may require to provide same model with added feature of GRIHA, in which model no may

change post suffix of G, GA, GB, GC, GD, GE etc. for which nothing shall be paid separately.

iii. The contractor shall submit design calculation of reduction in water demand by use of all such sanitary and water supply fixtures by more than 20% from GRIHA base case. The final procurement shall be done only after the confirmation that the products are reducing the water demand by more than 20% from GRIHA base case. Nothing shall be paid extra for this.

iv. Before taking up the work, the contractor shall prepare integrated shop drawings showing details of various pipe lines running horizontally and vertically and obtain approval of PMC. Integrated services drawings shall conform to local byelaws. The work shall be carried out as per approved integrated shop drawings for sanitary installations, water supply, rain water and drainage pipes.

v. Samples of all the pipes, fittings, fixtures etc., of make as per the list of approved materials shall be brought to site, well in advance, prior to start of any of the works and got approved by the PMC.

vi. Two sample toilets with all the pipelines, fittings and fixtures shall be prepared and tested for proper functioning of the system and got approved from the PMC before taking up mass work. The sample toilet(s) shall form part of the main work if the performance is found satisfactory; otherwise, the same shall be dismantled and redone by the contractor at his cost.

vii. The chasing, cutting and making holes in the masonry and / or cement concrete and / or RCC works shall be done carefully without causing any damage to the structure. As far as possible, mechanical cutters & core cutting machines shall be used in a workman like manner, for concealing the pipelines and fittings. The chases / holes, so made, shall be made good with non-shrink grout after testing of the pipe lines for leakage. The cost of cutting cores in RCC, cutting holes in masonry & making good the same shall be inclusive in the respective item of drainage/water supply lines.

viii. All vertical sanitary & GI pipes shall be fixed to hot dipped galvanized M.S supporting frame with “U” shaped G.I bolts, threaded at both ends, as specified, with GI nuts, GI washers, GI cleats etc. As approved by the PMC. Supporting frame shall be fixed with approved anchor fasteners as directed by the PMC. In all cases, pipelines shall be fixed, minimum 50 mm away from the finished wall face and shall not be fixed directly to the walls. The cost of providing and fixing GI supporting frame shall be paid for separately under relevant items.

ix. All horizontal pipes shall be fixed to the soffit of beams / slabs etc. With G.I. hanger rods & G.I. frame work as per the approved shop drawings and as directed by the PMC. The pipelines shall be clamped to the structural steel frame work with “U” bolts and nuts, washers, cleats etc., of length and diameter as required and as specified. The G.I. frame work shall be paid for separately under relevant items.

x. The contractor shall sequence the activities for external drainage and other pipe lines work in such a way that no hindrance is caused to other activities like laying of external electrical cable, development, landscape and road work etc.

17. Particular specifications – Aluminium work

i. The material for the work shall be procured from the approved manufacturer as per the list attached with the tender documents. The Contractor shall procure and submit samples of various materials to be used in the work for the approval of PMC and no work shall commence before such samples are approved. Samples of un-anodized as well as anodized aluminium sections, neoprene gaskets, glass, stainless steel screws, anchor fasteners, hardware and any other material or components requiring approval of samples, in opinion of PMC, shall be submitted for the approval as mentioned above. The above samples shall be retained as standards of materials and workmanship.

ii. The Contractor shall prepare the shop drawings for the aluminium windows giving details of the various aluminium sections, neoprene gaskets, cleats, anchor fasteners, hardware, sealants, glass etc. And submit the same for the approval of PMC.

iii. Only after the approval of the samples and the shop drawings by the PMC, the Contractor shall procure the material for the work. All materials brought to the site by the Contractor, for use in the work, as well as fabricated components shallbe subject to inspection and approval by PMC. The Contractor shall produce manufacturer's test certificates for any material or particular batch of materials supplied by him.

iv. The Contractor shall prepare a finished sample of the aluminium window along with glazing panel and fittings etc. For approval of workmanship and material. Nothingextra shall be payable on this account.

v. Aluminium sections to be used for various works shall be appropriate to meet technical, structural, functional and aesthetic considerations. The anodizing shall be carried out in an approved factory / workshop as specified in the tender documents.

17.1. Fabrication

17.1.1. All joints shall be accurately fabricated and be hairline in appearance. The finished surface shall be free from visible defects.

17.1.2. All hardware used shall conform to the relevant specifications and as per samples approved by the PMC. Design, quality, type, number and fixing of hardware shall be generally in accordance with architectural drawings and as approved by the PMC before use.

17.1.3. All doors, windows, ventilators and glazing etc. Shall be made water tight with neoprene gaskets and weather silicone sealants to the satisfaction of the PMC, for which nothing extra shall be payable.

17.1.4. The frames shall be strictly as per Architectural drawings, the corners of the frame being fabricated to the true right angles. Both the fixed frames and openable shutter frames shall be fabricated out of sections cut to required length, metered and mechanically jointed for satisfactory performance. All members shall be accuratelymachine milled and fitted to form hairline joints. The jointing accessories such as aluminium cleats, stainless steel screws etc. Shall not to cause any bi-metallic reaction by providing separators, wherever required.

17.1.5. Vertical members of the aluminium frame work shall be embedded in the floors, wherever required, by cutting and making good of the floor.

17.2. FIXING OF ALUMINIUM FRAME WORK

17.2.1. The anchor fastener/dash fastener and Screws used for fixing fixed aluminium frames of the aluminium windows to masonry walls / RCC members and aluminium members to other aluminium members respectively shall be of stainless steel of approved make and quality and of stainless-steel grade 304. Threads of machine screws used shall conform to requirement of I.S. 4218.

17.2.2. For the aluminium windows, the gap between the aluminium frames and the R.C.C / Masonry and also any gaps in the various sections shall be filled with weather silicone sealant DC 795 of Dow Corning or equivalent in the required bite size, to ensure water tightness including providing and fixing backer rod, wherever required. The weather silicone sealant shall be of such approved colour and composition that it would not stain or streak the masonry / R.C.C. work. It should not sag or flow and shall not set hard or dry out under any conditions of weather and shall be tooled properly. The weather silicone sealant shall be used as per the manufacturer's specifications and shall be of approved colour and shade. Any excess sealant shall be removed / cleared. Nothing extra shall be payable for the above.

17.2.3. Fixing of glass panes shall be designed in such a way that replacing damaged / broken glass panes is easily possible without having to remove or damage any members or interior finishing materials.

17.3. ANODIZING

17.3.1. Aluminium sections shall be anodized as per I.S. 7088 – 1973. Anodizing to be as per grade AC 20 and not less than 20 microns thick when measured as per I.S. 6012, in colour and shade as approved by the PMC.

17.3.2. The anodic coating shall be properly sealed by steam or dipping in de-ionized water as per I.S. 1868-1982 and / or I.S. 6057. Sealing quality shall be tested in accordance with the relevant standards. Nothing extra shall be payable on this account.

17.3.3. The Contractor shall satisfy himself by checking in the factory that the thickness of the anodic coating is found to be minimum 20 microns and sealing quality is appropriate everywhere. The testing shall be done in an approved laboratory by EDDY CURRENT

METHOD as per I.S. 6012 for thickness. For testing the thickness of anodic coating of the anodized aluminium sections, the calibration shall be done on bare (un-anodized) aluminium sections of same type. If any material is found sub-standard, it shall be rejected.

17.3.4. All anodized aluminium works shall conform to relevant I.S. Codes relating to materials, workmanship, fabrications, finishing, erection, installations etc. In this connection I.S. Codes including I.S. 1868 – 1982, I.S. 733 – 1983, I.S. 1948-1961, I.S. 7088-1973, I.S. 6012-1970, I.S. 1285 – 1975, I.S. 740-1975 are considered relevant and applicable.

17.3.5. The exposed surface of the aluminium sections shall be protected against surface damage, dents, scratches etc. It shall, therefore, be provided with protective tape. After fixing and assuring of proper functioning of doors, windows, frame work for partitions / false ceiling etc. Such protective tape shall be cleaned out / removed as per the directions of PMC. Nothing extra shall be payable for above.

17.4. Glazing

17.4.1. All glass panes shall be retained within aluminium framing by use of exterior grade neoprene gaskets. Use of glazing or caulking compounds around the perimeter of glass will not be permitted. There shall be no whistling or rattling. Before installation of glass, Contractor shall ensure the following:

17.4.2. All glazing rebates shall be square, to plumb, true to plane, dry and free from dust.

17.4.3. Glass edge shall be clean and cut to exact size and grounded

17.4.4. Annealed float glass in doors, windows, ventilators and fixed glazing etc. Shall be of approved make and standard quality conforming to C.P.W.D. Specifications.

17.4.5. 4 mm thick glass panes shall be provided for openings not exceeding 0.5 sqm. For openings exceeding 0.5 sqm in area, 5.0 mm thick glass panes shall be provided unless specified otherwise.

17.5. PROTECTIONS AND CLEANING:

17.5.1. All glass panes shall be retained within aluminium framing by use of exterior grade neoprene gaskets. Use of glazing or caulking compounds around the perimeter of glass will not be permitted. There shall be no whistling or rattling. Before installation of glass, Contractor shall ensure the following:

17.5.2. All glazing rebates shall be square, to plumb, true to plane, dry and free from dust.

17.5.3. Glass edge shall be clean and cut to exact size and grounded

17.5.4. Annealed float glass in doors, windows, ventilators and fixed glazing etc. Shall be of approved make and standard quality conforming to C.P.W.D. Specifications.

17.5.5. 4 mm thick glass panes shall be provided for openings not exceeding 0.5 sqm. For openings exceeding 0.5 sqm in area, 5.0 mm thick glass panes shall be provided unless

specified otherwise.

17.6. MEASUREMENT AND RATES:

17.6.1. Aluminium frame work shall be measured as per CPWD specifications.

17.6.2. For glazing, the actual area of the glass panels excluding the portion in the beading shall be measured in sqm upto two decimal places, for payment.

17.6.3. Stainless steel adjustable friction hinges and the aluminium handles for the openable side-hung windows shall be of as approved by the PMC. Minimum2 nos. Friction hinges shall be provided per shutter.

17.6.4. The cost of designing and preparation of shop drawings, all the samples, mock-up of window etc. Is deemed to be included in the cost of the relevant items. Nothing extra shall be payable on this account.

17.6.5. The item for aluminium for fixed portions for aluminium windows and frame work for partitions shall include cost of all inputs of labour, material (anodized aluminium sections, including cleats, other fixtures, weather silicone sealants, stainless steel screws, nuts, bolts, rawl plugs, backer rods, polyethylene tapes etc. Which shall be required for fabrication and erection of aluminium work) T & P, all incidental charges, wastages etc. Involved in the work. However, for the purpose of payment, the weight of aluminium sections for the fixed window frame and frame work for partitions, shall be measured in Kg. The aluminium cleats, stainless steel screws, nuts, bolts, separators etc. Shall not be measured separately for payment and their cost is deemed to be included in the cost of this item. The item for aluminium for frame work for fixed partitions shall also include cost of providing and fixing stainless steel anchor fastenersas required.

17.6.6. The item of aluminium for the openable aluminium shutters for windows and doors etc., shall include cost of all inputs of labour, material (anodized aluminium sections, including such as cleats / angles, other fixtures, stainless steel screws nuts, bolts, stainless steel hinges, weather silicone sealant etc. Which shall be required for fabrication of aluminium work) T & P, all incidental charges, wastages etc. Involved in the work. However, for the purpose of payment, the weight of aluminium sections for the window shutter (sash frame) shall be measured in Kg. The aluminium cleats, stainless steel anchor fasteners, screws, nuts, bolts, separators, stainless steel hinges, etc. Shall not be measured separately for payment and their cost is deemed to be included in the cost of this item(except dash fastener used for fixing with RCC members) . The anodized aluminium snap beading for fixing glass panels in the openable shutters of the windows shall be measured separately (on weight basis) and paid under this item of aluminium frame work for window shutters.

17.6.7. The glass shall be paid for separately under relevant item. The cost providing and fixing neoprene gasket, felt etc. Is included in the cost of this item and shall not be measured separately for payment.

17.6.8. The item for the aluminium frame work includes cost of making provision for fixing fittings, wherever required, as per the item description (The cost for providing fitting (handle, lock and buffer) shall be paid for separately).

18. Particular specifications for waterproofing treatment

18.1. All the water proofing treatment shall be got executed through one of the specialized agencies as per the list of approved agencies attached with the tender. The water proofing agency shall carry out water proofing work with one of the approved water proofing compounds mentioned in the tender. If so specifically requested by the contractor, he will be allowed to use other water proofing compound meeting various technical parameters, subject to prior approval of PMC.

18.2. The work under this sub-head in general shall be carried out as per the CPWD specifications, as per the manufacturer's specifications, as per architectural drawings and as per directions of PMC.

18.3. Ten years guarantee in prescribed proforma attached shall be given by the contractor for the water proofing treatment. In addition, 10% (ten percent) of the cost of these items of water proofing under this sub head shall be retained as guarantee amount to watch the performance of the work executed. However, half of this amount (withheld) would be released after five years from the date of completion of the work, if the performance of the waterproofing works is satisfactory. The remaining withheld amount shall be released after completion of ten years from the date of completion of work, if the performance of the waterproofing work is satisfactory. If any defect is noticed during the guarantee period, it should be rectified by the contractor within seven days of issuing of notice by the PMC and, if not attended to, the same shall be got done by PMC through other agency at therisk and cost of the contractor and recovery shall be effected from the amount retained towards guarantee. The guarantee amount can be released in full, if bank guarantee or e-bank guarantee of equivalent amount, valid for the duration of guarantee period, is produced and deposited with the Department.

18.4. Waterproofing Treatment for PODIUM for grade A,B/C and Grade D towers

18.4.1. Surface Preparation:

1) Careful surface preparation is essential for optimum finish and durability. The surface needs to be made clean, dry and sound, free of any contamination by wire brushing, which may harmfully affect the adhesion of the membrane. Maximum moisture content should not exceed 8%. Substrate compressive strength should be at least 25 Mpa, cohesive bond strength at least 1.5 MPa.

2) New concrete structures need to dry for at least 28 days. Possible surface irregularities need to be smoothened. Any loose surface pieces and grinding dust need to be thoroughly removed. All potholes shall be repaired with Polymer modified mortar made by adding Dr. Fixit URP @ 10% or Equivalent in BASF/Fosroc/Tikadine byweight of cement.

3) Cleaning of wall and floor junctions with compressed air and make angle fillet / watta of 50mm X 50mm with PMM made by adding Dr. Fixit URP @ 10% or Equivalent in BASF/Fosroc/Tikadine by weight of cement at the junction of wall and floor, followed by laying of 40 GSM geo textile sandwiched with Hybrid polyurea / Polyurethan waterproof coating.

4) Construction Joint treatment: a) Cleaning and making necessary surface preparation to remove any dust and laitance etc., chasing open the construction joints and sealing the same to form a U - shaped groove of approx. 20mm width and 10mm depth, using Dr. Fixit PU Sealant or Equivalent in BASF/Fosroc/Tikadine.

5) Pipe outlet / bore packing treatment - all locations in superstructure:
   - The gap between the pipes / sleeves / bore and RCC shall be free from dust, laitance, oil and water using compressed air or by mechanical measures. All Pipesto be placed/inserted in the core cut areas shall be aligned properly prior to bore packing.
   - Cleaning / Roughening the inside surface of the bore hole.
   - Pipes to be inserted in the core cut areas with effective leak-free shuttering system.
   - The pipe to be inserted, appropriately roughening with hacksaw-blade, applying a coat of Dr. Fixit Pidicrete URP or Equivalent in BASF/Fosroc/Tikadine and over this, sprinkling sand to receive non-shrink grout.
   - Filling the gap between PVC pipe and core cut with Dr. Fixit Pidigrout 10M / Dr. Fixit Micro Concrete or Equivalent in BASF/Fosroc/Tikadine including shuttering the gap bottom with backer rod or with suitable material.

18.4.2. Application Waterproofing:

i. Priming the surface with single coat of Dr. Fixit Cipoxy 16 D or Equivalent in BASF/Fosroc/Tikadine with roller/ airless spray applied with a total consumption of 250gms/Sqm or as per manufacturer's specification. Coating shall be allowed to touch-dry condition.
ii. Porous substrates may require a second coat to ensure the surface is fully sealed.
iii. If the time is lapsed for more than 24 hours, abrade the primed surface to have a mechanical key or apply another thin coat of primer Dr. Fixit Cipoxy 16 D (Equivalent in BASF/Fosroc/Tikadine).
iv. Anti slip grains of 200-300 micron (dried sand) on wet primer at coverage of 1.5 - 2.5 kg/m2 and allow to come to touch dry condition. Remove unstuck or loose grains by air blower.
v. Over the primed surface, applying two component spray applied hybrid Polyurea waterproofing coating, using plural component Graco machine, with a total consumption of as per manufacturer specification to achieve a DFT of 1.5mm.
vi. The coating shall be done on the entire horizontal area and shall be continued to vertical areas up to 300mm above the FFL.
vii. Allow the coating to completely cure for 7 days @20°C

18.4.3. Pond test:

Ponding of the slab shall be carried out to check the efficacy of waterproof coating by filling water to 50mm depth for minimum 96 Hrs.

18.4.4. Protection & Slope over the waterproof membrane (Horizontal Areas):

Lay minimum 100 GSM geotextile membranes over the waterproofing membrane to create a separation layer as well a protection layer from concrete screed. The geotextile layer shall have 100 mm overlap and spot bonded and shall be extended at the wall up to 100mm above the slab floor. b) Lay Concrete screed of M20 grade concrete (RMC) (to be paid as separately under relevant items) over the geotextile membrane admixed with polypropylene fibre at 0.9Kg/cum in site mix to minimize shrinkage cracks in the screed and to provide slope of 1:100. towards the drain outlets for effective and efficient draining of water, including making of angle fillet along with concrete screed and within 24-36 hours of screed laying, saw-cutting panels of 3m x 4m (approx. 6mmWx 10mm D) and filling the grooves with PU/PS Sealant of Dr. Fixit or Equivalent in BASF/Fosroc/Tikadine.

18.4.5. Protection over the waterproof membrane (Vertical Areas):

I. Over the waterproofing membrane apply 2 coats of Dr. Fixit Epoxy Bonding Agent or Equivalent in BASF/Fosroc/Tikadine.

II. Sprinkle sand over the primed surface at 2 – 3Kg/sqm when the bonding agent is wet. Allow it to dry to form firm key for the plaster.

III. Lay 15mm thick plaster in two coats over the prepared surface of cement sand mortar admixed with integral waterproof compound conforming to IS 2645-2003, Dr. Fixit Pidiproof LW+. or Equivalent in BASF/Fosroc/Tikadine (to be paid as separately under relevant items)

IV. The surface brooming, curing of the surface by water sprinkling shall be done for 7 days.

V. The Rolled matrix Drainage layer with filter medium as specified by Landscape architect / engineer shall be laid over the protection screed before soil filling. For Planter Boxes: Separate Anti-Root Treatment above the Screed (Trees above 2MTR Height (to be paid as separately under relevant items, if required):

VI. Prime the surface with solvent based bituminous primer. (To be paid as separately under relevant items, if required)

VII. Stick peel and Lay SBS modified cold applied preformed Anti-root membrane SAM AR over the primer. The overlaps shall be minimum 50mm selvedge and self-sticking. (To be paid as separately under relevant items, if required)

VIII. The Rolled matrix Drainage layer with filter medium as specified by Landscape architect / engineer shall be laid over the protection screed before soil filling (To be paid as separately under relevant items, if required).

18.5. Waterproofing Treatment for bathroom/UG tank/STP/ Retention Tank? OHT? Swimming Pool

18.5.1. Surface Preparation:

1. Proper and careful surface preparation will lead to complete adhesion of membrane with the substrate.

2. Concrete surfaces should be fully cured (minimum 28 days) prior to application.

3. All Pipe inserts Treatment: Wrap the PVC pipes with non-reinforced twin-sided self-adhesive bituminous membrane Dr. Fixit Bath Seal Tape or Equivalent in BASF/Fosroc/Tikadine. and then fill the gaps around pipes with cementitious free flow expanding grouts Dr. Fixit Pidigrout 10 M or Equivalent in BASF/Fosroc/Tikadine. All concealed plumbing ducts must be sealed with Dr. Fixit URP modified Polymer modified mortar or Equivalent in BASF/Fosroc/Tikadine.

4. Angle Fillets/Vata/Coving: Providing 50 x 50 mm Angle fillet on all vertical up-stands & junctions /corners with sand -cement Polymer modified mortar all around the periphery of the of the bathroom sunken portion.

5. Apply coating in SSD condition. All surface excess water shall be removed to achieve fully saturated substrate with dry surface condition.

6. It is mandatory that all works of plumbing and sanitation must be complete before taking up application of Dr. Fixit Fastflex or Equivalent in BASF/Fosroc/Tikadine.

18.5.2. Repair of Cracks:

1. Wet the concrete surface with potable water and make sure that the surface is kept moist so that the water cement ratio in the polymer modified mortar is maintained during the application.

2. Surfaces containing large blow holes cracks and surface defects must be repaired with polymer modified mortar (PMM), mix in the proportion of (1: 5:15) Dr. Fixit Pidicrete URP (or Equivalent in BASF/Fosroc/Tikadine): Cement: Fine Sand: by weight. The surface must be kept moist followed by application of 1 bond coat of Dr. Fixit Pidicrete URP or Equivalent in BASF/Fosroc/Tikadine.

18.5.3. Waterproofing Coating:

i. Use slow speed mechanical mixer, add powder component slowly to the polymer in a clean container. Stir till smooth and homogeneous slurry, without any lumps, is

achieved.

ii. Allow the mixed slurry to stand for 2-3 minutes for releasing entrapped air during.

iii. The surface of application must be pre-wetted thoroughly with water & brought to a touch dry state. Take up the first coat application of Dr. Fixit Fastflex or Equivalent in BASF/Fosroc/Tikadine with a stiff nylon brush. Work well into the substrate, to ensure that all small undulations are completely filled with the coating.

iv. Provide and lay 45 gsm glass fibre mesh over the angle fillet when the first coat in still wet. After completion of first coat, take up second coat application in a direction perpendicular to the first coverage at the rate 0.42 - 0.50 M2 / Kg / 2 coats or as per manufacturer specification in a span of 4-6 hours with a roller / brush on the prepared concrete substrate.

v. Coating should be extended to 1 m height to all walls and width of wall area, including shower area, splash zone to ensure complete waterproofing.

vi. For vertical surface sprinkle fine sand / silica sand over the second coat of Dr. Fixit Fastflex or Equivalent in BASF/Fosroc/Tikadine when it is wet stage and allow it to dry to form firm key to the plaster.

vii. Air cure the coating for 96 Hrs.

18.5.4. Pond Test:

Ponding of the slab shall be carried out to check the efficacy of waterproof coating by filling water to 50mm depth for 48 Hrs.

19. <u>Particular specifications for curtain glazing</u>

19.1. Scope of work

19.1.1. The scope of work under this sub-head includes design, supply, fabrication, installation, aligning, fixing, protection and testing of the curtain glazing. For executing the work under this sub-head, the contractor shall associate with one of the agencies mentioned in the list of the specialized agencies.

19.1.2. The work under this sub head includes cost of all inputs of labour, materials including wastages, T &P, equipment's , other enabling temporary structures and services and all other incidental charges, if any, not specifically mentioned here, but as required for complete design, engineering, fabrication, assembling, delivery, anchorage, installation, protection of curtain glazing, And making the system water tight (wherever specified), all complete, all in accordance with the true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and / or described in the specifications , provided that the same can be reasonably inferred there from. The curtain glazing shall have framing which shall be structurally and mechanically designed to achieve the

architectural elevations as well as performance parameters specified herein. Anchorage shall include all supporting brackets & anchor fasteners, as required to rigidly secure the structural framing to the RCC / Masonry / structural steel membersof the building.

19.1.3. The curtain glazing work shall include but will not necessarily be limited to the following:

19.1.3.1. Frames, fixed glazed / vision panels, spandrels, hard wares, open able panels, as in the drawings inclusive of all accessories and fittings. Glass wool Insulation panel (shadow box), fire stop(barrier) - cum - smokeseals, splice plates, connectors, sleeves, anti- buckling clips etc.

19.1.3.2. Anodized aluminium work for framing of curtain glazing as well as wherever indicated in the schedule of quantities and drawings, Glazed doors.

19.1.3.3. Structural, weather and other silicone sealants within and all-round the perimeter of all the work under this sub head for fabricating igus,holding the glass to the aluminium & glass to glass and to provide water tightness to the curtain glazing.

19.1.3.4. EPDM / silicone gaskets, trims, shims, setting blocks, double sided spacer tape, spacer blocks, weathering strips etc

19.1.3.5. All sealing and flashings including sealing at junctions with the building members.

19.1.3.6. All brackets, anchor fasteners, screws, inserts, nuts, bolts & washers, and attachments required for complete installation and fixing to the RCC, masonry and / or the structural steel members of the building.

19.1.3.7. All accessories, fasteners, screws, nuts and bolts, toggles, rivets etc. And other items implied in the drawings and the specifications though are not specifically indicated or mentioned here.

19.1.3.8. Isolation of all dissimilar metal surfaces as well as moving surfaces by use of TEFLON (PTFE) separators.

19.1.3.9. Engineering proposals, design, drawings and Architectural data.

19.1.3.10. Shop drawings, engineering data and structural calculations (analysis & design) of all systems including aluminium structural framing, fasteners, sealants etc.

19.2. Scheduling and monitoring of the work.

19.2.1. Cost of all samples of the individual components, mock-ups at site and field tests.

19.2.2. Coordination with work of other agencies / contractors employed on site.

19.2.3. Protection during storage and construction until handing over the building for occupation etc.

19.2.4. All final exterior and interior cleaning of the curtain glazing, before handing over the building for occupation.

19.2.5. Hoisting, staging, scaffolding and temporary enabling structural work/ services, cranes and cradles etc.

19.2.6. Specified tests, inclusive of necessary records, reports, logbook etc.

19.2.7. Design and performance guarantee in the enclosed format.

19.2.8. Construction monitoring for regular quality control and technical inspection to ensure the work conforms to the approved shop drawings and details (including any modifications made after field testing) and acceptable standards of quality including monitoring the progress of the work.

19.3. Standards

In general, the Contractor shall follow either of the latest Indian/ International Standards as applicable for this sub head.

19.4. Contractor's responsibility for design

1) Architectural drawings and specifications only indicate the required basic dimensions, and performance criteria.

2) The contractor shall be solely and fully responsible for proper structural analysis and design for various load cases and their combination. This shall include designing and proper sizing of all sections meeting structural and architectural requirements. The anchor assemblies shall meet the performance and design requirements including installation of all inserts, fasteners, clips, bracing and framework as required for the proper anchorage to the structure, unless otherwise specified.

3) Design of the curtain glazing system shall comply with all Government codes and regulations. The Contractor shall design the entire curtain glazing system for dead loads, wind loads, seismic loads, storm, air pollution, thermal stresses, building movements and consequent deflections without compromising the performance characteristic. Further, the individual members of the structural framing shall not

deflect beyond permissible limits as specified. The design shall comply with the requirements of the relevant National Building Code and Indian Standard Code/ International Standards, unless specified otherwise.

4) The curtain glazing system and its elements shall not sustain permanent deformation or failure under loading equivalent to 1.5 times the design wind pressure.

5) The specified deflections must be reduced if they are in any way detrimental to curtain glazing system and building.

6) The approval of the structural design and shop drawings by the PMC shall not relieve the contractor from his responsibility for the structural design.

7) The Contractor shall ensure that the elevations are strictly as per the architectural drawings and that the intent of the architectural design is retained. Visual appearance shall be a key consideration for acceptance of work.

19.5. Shop drawings

1. Submittals:

The contractor shall prepare shop drawings based on approved design and submit the same to the Engineer –in-charge for approval.

1.1. The review of the shop drawings by the PMC shall be limited to their conformity to the architectural and structural design concept & specifications.However, the approval of the shop drawings by the PMC shall not relieve the contractor from any of his responsibilities and requirements as specified herein.

1.2. No fabrication shall be taken up until the shop drawings and all other related submittals, documentation, certification, samples and the mock-up for that work have been reviewed and approved by the PMC.

1.3. After approval by the PMC, the Contractor shall submit 6 sets of the approved shop drawings to the PMC within three weeks. After the completion of work, two (2) sets and two (2) CD's each of the final approved shop drawings incorporating all the approved modifications, if any as per the siterequirements, shall be submitted to the PMC within two months failing which the final payment shall not be released to the contractor.

2. Scope of shop drawings

2.1. Shop drawings shall incorporate scaled and dimensioned plans, elevations, sections and complete size details for all the works.

2.2. The shop drawings shall indicate the required dimensional profiles and modules, function, design and performance standards and in general cover all dimensions and details required to fabricate and install the curtain glazing system.

2.3. The contractor shall verify and co-ordinate the shop drawings with all applicable and inter- related trades, drawings and specifications.

2.4. All dimensions / modules, etc., shall be field checked and the drawings shall be modified, if required, based on actual measurements at site.

2.5. Details shall show and specify all metal sections, types of finishes, areas to be sealed and sealant materials, gaskets, applicable construction materials including fasteners and welds, all anchorage assemblies and components, fabrication and erection tolerances for the work.

2.6. All details shall be subject to the approval of the PMC, after incorporating all the modifications suggested by the PMC.

3. Section profiles

3.1. Profile adjustments, if required as per the site conditions may be allowed by the PMC subject to meeting the architectural / performance requirements. However, this shall be carried out only with the written approval of the PMC provided that the general design and intent of the drawings and specifications are also maintained. Also, if any new / non-standard aluminium extruded section is required as per the site requirement and / or the architectural drawings for functional and / or aesthetic reasons, the contractor shall procure the same from the approved manufacturers for the aluminium sections, even if it entails preparing new die, etc. Nothing extra shall be payable to the contractor on this account.

4. Documentation and certification

4.1. The contractor shall obtain and submit to the PMC the manufacturer's certificate for compliance of the various components/ materials for the works (under this sub head) as per the manufacturer's specifications for the various characteristics.A copy of the manufacturer's test report for each lot of material procured and supplied for the work shall also be obtained from the respective manufacturers and submitted to the PMC for the record.

5. Glass and glazing documentation

5.1. Before taking up the work, the glass manufacturer / processor shall submit written certification for the review of the PMC and record , stating that all glass (properties as specified such as U value, shading coefficient, light transmission, solar factor, relative heat gain etc.) And glazing requirements (including heat strengthening/ toughening, reflective soft coating, low E coating, lamination, fabrication of igus including sealants) as per the shop drawings are recommended by them for use relatedto their specific applications and design parameters and that they are in conformity

with the specifications.

5.2. Tests shall be carried out for glass, including properties after processing, for each lot supplied, by the glass manufacturer / processor in his factory / laboratory or any other accredited laboratory and the copies of the test results shall be obtained by the contractor and submitted to the PMC for the record.

6. Sealant Documentation

6.1. All sealant applications must be clearly designated on shop drawings.

7. Quality control documentation

7.1. The contractor shall submit the methodology and quality assurance statement for quality control procedures for the review and approval of the PMC before taking up the work to ensure the design integrity and performance of thecurtain glazing, aluminium composite panel cladding and aluminium work (PVDF coated).

7.2. The PMC or his authorized representatives may visit the plant / workshop / factory to inspect material, fabrication and quality assurance procedures.

8. Samples and mock-up at site

8.1. The samples of the following materials together with detailed technical data / catalogues shall be submitted for review and approval of the PMC along with the shop drawings. Any omission of an item, or items which require the Contractor's compliance shall not relieve him from responsibility.

Aluminium extrusions	Each section: 500mm long.
Glass	Each type 600 mm x 600 mm.
Gaskets, separators, glass setting blocks / spacer tape, etc	Each section or unit, backer rods, 300mm long or unit
Bracket, fasteners and Connecting devices	Each type and size
Finish samples	After approval of the final finish coating, the PMC shall be provided with three (3) approved samples.
Ironmongery and accessories, as applicable. Finished flashing samples Finished samples of shadow boxes, fire stop (barrier)-cum smoke seals Structural and weather silicone sealant	

9. Mock-up at site

9.1. Before the fabrication and site installation is taken up and after the approval of shop

drawings by the PMC, the Contractor shall prepare a mock-up, of his proposed curtain glazing system for a size of panel not exceeding 6 sqm. The mock-up shall be essentially put up at site for final approval of all materials and installation details by the PMC. The mock up shall not form part of the work and shall not be paid for. It shall be dismantled and taken away by the contractor at his owncost, with the prior permission of the PMC. Nothing extra shall be payable on this account.

10. Storage, protection and programme

10.1. The contractor shall submit a schedule of procedure for inspection during installation so as to control and assure quality on the job site.

10.2. The Contractor shall submit a detailed method statement for the protection of the surface of the curtain glazing, aluminium composite panel cladding and aluminium work (PVDF coated), etc during delivery and erection, with description as to when the protection can be removed. The protection paper shall be kept for a period as recommended by PMC and shall be replaced with the fresh protection paper, if so required. Further, it shall not have acid content, which in any manner may affect the substrate.

10.3. Delivery and Storage of Materials: All materials delivered to site shall be stored in allocated spaces where the stored materials shall not get exposed to rainwater, moisture or damage, and shall permit easy access to and handling of the materials. Materials shall be stored neatly and properly stacked.

10.4. Factory made glazing units and/or their components shall be transported, handled and stored in a manner to preclude damage of any nature.

10.5. Accessory materials, required for erection at the site shall be delivered in labeled containers by the manufacturer / supplier.

10.6. All units or components, which are cracked, bent, chipped, scratched or otherwise defective and unsuitable for installation shall be removed and replaced by the contractor. Nothing extra shall be payable on this account.

11. Performance requirements

11.1. All components, assemblies and completed work shall conform to the various performance standards as applicable in respect of thermal movement of the curtain glazing, allowance for vertical and horizontal expansion and building movement and related building tolerance etc. The design and installation of the curtain glazing system shall accommodate all inherent building movements and deflections and the fabrication and installation tolerances of all related work not involved in this section without the loss of, or any detrimental effect to, the performance requirements herein specified. The contractor shall verify and coordinate all such movements and tolerances with the PMC before designing the components of the curtainglazing system so that movements and deflections in the structure do not at any time

affect the integrity and safety of curtain glazing system and vice versa.

12. Thermal property

12.1. All insulation materials, fire-stops (barriers)-cum-smoke seal shall comply with the current requirements of the Fire Officer, MIDC and other authorities.

13. Structural properties

13.1. The curtain glazing system shall be anchored to the R.C.C floor through serrated Hot Dipped Galvanized M.S brackets. As far as possible, the contractor shall take all precautions to avoid cutting through any reinforcement bars while fixing the brackets. The contractor may at his own cost provide sleeves/ leave slots at appropriate

locations during casting of the concrete itself for making provision for fixing brackets for the curtain glazing system and to avoid chipping/ dismantling of concrete. The slot shall be filled up with concrete of the same grade in a workman like manner, after fixing the brackets. Any defect in alignment/ plumb in the building face shall be rectified by chipping/ dismantling of the concrete/ masonry and repairing the same as specified to achieve the required alignment of the curtain wall as specified. Any change in lengths of bracket/s required on this account and the consequent requirement of their sections and sizes shall be carried out by the contactor at his own cost. Nothing extra shall be payable on this account.

13.2. No holes shall be burned, filed or drilled in any structural steel/ RCC members unless expressly approved by the Engineer – in – Charge.

13.3. Member shapes and/or profiles if schematically shown on the Architectural drawings are not necessarily the exact shapes required or best suited for the particular conditions. Final shapes and locations shall be as designed by the contractor and are subject to the review and approval of the Engineer – in – Charge.

13.4. All framing members shall be shop fabricated and finished as specified.

14. Concrete tolerances

14.1. The contractor shall take all precautions to construct the buildings within specified tolerances in concrete and masonry faces. Any defects beyond the permissible tolerances shall be rectified by the contractor at his own cost to the entire satisfaction of the Engineer – in – Charge. While fixing the brackets for curtain glazing system, the contractor shall take into account the variation in the concrete and the masonry faces to which the structural framework of the curtain glazing system is to be fixed and such variations shall be adjusted in the lengths of brackets to align them in perfect plumb. The bracket shall be designed accordingly. Nothing extra shall be payable on this account.

15. Fire stops (barriers)-cum-smoke seal and interface with building (No separate item is payable, cost is deemed to be included in the various item of glazing)

15.1. Gaps between the building face and the curtain glazing system at soffit level between the successive floors shall be closed as specified with fire-stops (barriers)-cum-smoke seal. It shall have the required fire resistance to be approved by Fire Officer, of local body. Suitable gap for accommodating deflections of the aluminium framing of curtain glazing system as per the approved shop drawings shall be maintained between the fire-stops (barriers)-cum-smoke seal and the curtain glazing system. This smoke seal shall however be provided using backer rod and weather silicone sealant as specified and as approved by the PMC.

15.2. The fire-stops (barriers)-cum-smoke seal shall consist of 1 mm thick plain G.I. sheet tray with 100 mm thick layer of non-inflammable heat insulating material, rock wool, having density of minimum 64 Kg. Per Cum. Of the make as approved by the PMC. The rock wool layer shall be attached to G.I sheet using stainless steelrivets/ nuts, bolts and washers. The tray shall be fixed to the RCC / Masonry surface by using stainless steel screws dipped in weather silicone sealant as per the approvedshop drawings. Screws with plastic sleeves shall not be allowed to be used for the above fixing.

15.3. The contractor shall provide an aluminium flashing of 1.0 mm thick transparent anodized (10-micron thickness) solid aluminium sheet of the approved design and profile at the window sill level and also fill the gap between the aluminium flashing and the curtain glazing using weather silicone sealant as specified and as approved by the PMC. Also, the fasteners/ screws to be used for fixing flashing shall be dipped in weather silicone sealant before using.

16. Acoustics

16.1. Gaps between the mullions and the partitions of the cabins shall be suitably closed by double skin partition as directed by the PMC including allowing for permissible deflections of mullions as per design requirements but without affecting the partitions and the curtain glazing system. The payment for this partition work shall be made under relevant item.

16.2. Provisions shall also be made to prevent metal to metal rubbing, any rattling, noise due to thermal changes and wind pressure by using Teflon separators and shims.

17. Visual appearance

17.1. The Contractor shall ensure that the elevations are strictly as per the Architectural drawings and that the intent of the architectural design is retained. Visual appearance shall be a key consideration for acceptance of work.

18. Materials (General)

18.1. Materials and components used shall be of the first / superior quality and suitable for the purpose.

18.2. All materials shall be free from any defects that may impair the strength, functioning/ performance or appearance of the curtain wall or adjacent construction.

19. Fasteners

19.1. The type, size, alloy, quantity and spacing of all anchor fasteners and/or anchorage devices shall be as required for the specified performance standards.

19.2. Bolts, anchors and other fastening devices like screws, nuts, washers etc. Shall be of approved types as required for the strength of the connections, shall be self- locking, unless otherwise specified. These shall be of austenitic stainless steel of specified grade and shall be torque tightened, wherever required, to achieve the maximum torque tension relationship in the fasteners. Washers, nuts and all accessory items shall be of the same material as fasteners. The rivets/ nuts, bolts and washers for fixing insulation layer to the shadow box or with fire-stops (barriers)-cum-smoke seal shall be stainless steel of approved grade.

The anchor fasteners shall not be provided using PVC sleeves. Only expandable type self-locking fasteners shall be provided.

Types of fasteners	Grade of stainless steel
Anchor fasteners	Stainless steel grade 316 (Hilti/Fischer/Wurth)
Screws, Nuts, Bolts, Washers	Stainless steel grade 304
R, toggles and the like	Stainless steel grade 304

20. Aluminium extrusions

20.1. In general aluminium alloy for extrusions shall be 6063 T5 or T6 grade as per B.S.1474. However, the grade and tempering specifications shall be as recommended by the supplier for each application.

20.2. All extruded aluminum sections shall be anodized in approved colour to a minimum thickness of 20 microns. The colour and the finish shall be uniform and free of streaks. The aluminium sections, before coating, shall be suitably cleaned, rinsed, buffed properly and sealed and protected after anodizing, till the completion of the work.

20.3. All surfaces of the aluminium sections designed to receive the sealants shall be finished properly to match the finish of the parent section as used for initial testing of sealant and aluminium surface adhesion. Further, it shall be ensured that the entire aluminium surface has adequate sealant contact and adhesion.

20.4. Sill sheets, plates and extrusions shall be visually flat under all lighting conditions.

20.5. The members of aluminium extruded sections for mullions, transoms, members of sub frames & sash frames shall be in single piece and not be splice jointed in the panel length and height.

21. Aluminium flashing

21.1. All flashings shall be made from 1.0 mm thick solid aluminium sheet transparent anodized to a minimum thickness of 10 microns. It shall be fixed using stainless steel screws dipped in weather silicone sealant.

22. Brackets

22.1. The brackets shall be fixed with high degree of accuracy to achieve the elevation as per the architectural drawing. The brackets shall have suitable lengths and sections to align curtain glazing in one face, as required as per the architectural drawings. Nothing extra shall be payable on this account. The brackets shall be fabricated from M.S rolled sections / plates to have the design strength. The quality of the weld shall also be ensured as per the standards. These shall be provided corrosion protection treatment by Hot Dipped Galvanizing. The mass of the zinc coating to be not less than 610 gm. Per sqm of steel area to be galvanized. Slots of elliptical or circular shape in the brackets shall be pre-drilled / machine punched and not flame-cut and it shall be done before galvanizing. The surface of the brackets shall be serrated for additional grip before galvanizing. Washers made of serrated plates of the corresponding material shall also be provided for additional grip. The directions of the serration and the slot shall be such that they allow movements as per the design requirement and at the same time prevent any movement in the other direction. Each bracket shall be fixed to the R.C.C using anchor fasteners of suitable capacities and in numbers as required as per the design requirements. The brackets shall be fixed to the structural steel members of the building using stainless steel bolts & nuts / fasteners of required capacity and in numbers as per the design requirement. The holes of the required sizes shall be pre-

drilled in RCC/ structural steel for fixing anchor fasteners/ bolts etc. Nothing extra shall be payable on this account.

23. Fittings

23.1. All hardware and fittings such as patch fittings, handles, locks, stay-arms, floor springs, friction stays etc. For doors, windows and open able panels shall be heavy duty and of approved make as specified.

23.2. Hinges for open able panels shall be heavy duty top hung stainless steel friction hinges selected for specified wind load and dead loads.

23.3. All fittings and locks shall be as specified.

23.4. Each open able panel of the Curtain glazing shall be provided with the fittings as specified in item nomenclature.

24. Sealants & gaskets

24.1. Selection of sealants

i. The compatibility and sequence of installation for all sealants must be carefully considered in all proposals in order to ensure the required curing and performance.

ii. Sealants must not degrade and / or fail under any or all design conditions including wind, thermal and seismic movements, exposure to water and humidity, ultraviolet exposure and / or other adverse environmental conditions.

iii. The designations of sealant types specified herein are intended for general design guidance only. The contractor shall however use sealant equivalent to or superior than that specified herein. Nothing extra shall be payable on this account.

iv. Final selection by the contractor for the sealant types shall be based on their conformity with the Performance Requirements specified herein and as per the recommendations of the sealant manufacturer. The contractor may use sealant of equivalent grade and characteristics, manufactured by the manufacturer other than those specified herein, based on recommendations of those sealant manufacturers for specified use but with the prior approval of the PMC. The contractor shall submit the documentary evidence in this regard.

v. All precautions shall be taken during design of structural silicone bite and also during fabrication of the curtain glazing system to prevent failure of sealant during the guarantee period of 10 years after the date of completion of work and even beyond, upto the expected service life of the curtain wall. Sealants and gaskets shall not leach, discolour, stain or dry.

24.2. Structural silicone sealant

i. The sealant manufacturer shall design the silicone bite for the design loads as specified and likely to come during the life of the curtain glazing system for arrivingat bite size of the structural silicone sealant.

ii. The structural silicone sealant bite as designed by the sealant manufacturer and as per the approved shop drawings shall be provided. If the contractor provides larger bite than that specified, nothing extra shall be payable.

iii. The Structural sealant shall be two-part pump-filled Silicone sealant DC 983 of Dow Corning or equivalent recommended by manufacturer and approved by the PMC. The weather silicone sealant shall be one-part Silicone sealant DC 795 of Dow Corning or equivalent of other approved brand as per the list of approved materials.

iv. The structural sealant to be used as specified for all exposed and concealed metal to metal (including tight or butt type metal to metal assembly prior to assembly) or glass to glass shall be 2-part silicone sealant, conforming to the manufacturer's recommendations for the specific uses and performance criteria. The sealant shall be applied using two-part pump for the same. All the sealing shall be done in a clean and controlled environment as specified by the silicone sealant manufacturer.

v. In unavoidable circumstances, where it is required to provide structural silicone sealant in - situ, 1-part structural silicon sealant – 995 of Dow Corning or equivalent of other approved brand shall be used with prior approval from the PMC. Mechanical supports shall be provided, if required, till the final curing of the structural silicone. Nothing extra shall be payable on this account.

vi. The contractor of the curtain glazing system may at their own cost provide structural silicone sealant – DC 995 / DC 983 of Dow Corning or equivalent as weather silicone sealant as well for water tightness also, apart for structural requirements, instead of weather sealant - 795 of Dow Corning or equivalent as required and as specified. However, nothing extra shall be payable on this account.

24.3. Weather silicone sealant

The grade of weather silicone sealants wherever required like for concealed metal to metal, metal to glass and metal to concrete/ masonry such as embedment and lapping of flashings etc. Where elements are to be installed or embedded, the weather sealant shall be of grade 795 of Dow Corning or equivalent for the other approved brand, as per the recommendations of the sealant manufacturers. Also, the gap between the aluminium sections and the glass, if so required, shall be filled with weather sealant as specified above including providing and fixing backer rod wherever required as per theapproved shop drawings. The weather silicone sealant shall be of approved colour and shade. The weather silicone sealant for fixing the butt jointed glass for the fixed partitions shall be transparent in colour DC 791 of Dow Corning or equivalent of other approved brands.

24.4. Compatibility

All sealants must be non-staining and compatible with adjoining sealants, backup materials, substrate materials and their respective finishes and/or applied colour coatings. Care shall be taken to ensure that two different types of sealant should not come in contact with each other unless compatibility is satisfied as per manufacturer's specifications.

24.5. Caulking compound

Dow Corning weather silicone sealant – 795 or equivalent as approved by thePMC, (of approved colour and shade to match adjacent material wherever exposed and visible) for use around frame/ flashings or between frame/flashing and RCC/ masonry surface.

24.6. Gaskets

Gaskets and seals shall be of approved quality compatible with substrates, finishes and other components they are in contact with. All gaskets exposed directly on the exterior face shall be silicon gaskets, which are UV resistant. They shall not degenerate, discolour or leach on exposure to solar radiations/ rains/ pollutants etc.
Manufacturers' test Certificate shall be submitted as specified.

25. Glass

25.1. General

i. All glass and glazing materials shall be as specified.

ii. Vision and spandrel glass shall have characteristics as specified. THE PERFORMANCE CHARACTERISTICS OF GLASS PANELS, have to be ensured by the contractor within the constraints of aesthetic requirements like colour, shade, reflectivity etc. And performance requirements like light transmission, U value, shading coefficient, relative heat gain etc. As specified. Minor variations in the characteristics of glass on superior side may be allowed, if required by the contractor with the approval of PMC, but without any extra cost to the Department on this account.

25.2. Installation

i. The Contractor shall procure and install glass panels and carry out glazing work as indicated on the drawings and as specified herein.

ii. All glass panels shall be of accurate sizes as required.

iii. All glass panels shall have clear undamaged edges and surfaces, which are not disfigured.

iv. Any glass panel that does not fit in the curtain glazing system shall be rejected and replaced by the Contractor at his own cost. Therefore, all care and precautions shall be taken by the contractor while procuring the glass panels from the manufacturer /

processors of the glass.

v. No claims of any kind or any hindrance shall be entertained from the contractor on this account.

vi. Glass panels shall not be in direct contact with the aluminum framework.

25.3. Identification

i. Permanent identification marking on glass shall be accomplished by a technique selected by the manufacturer. The location of the marking shall be proposed by the Manufacturer and approved by the Engineer – in - Charge. All glass shall be deliveredto site with the manufacturer's / processor's label of identification attached.

25.4. Breakage

i. All glass with any breakage, any damage to the coatings or any other defects caused due to the negligence of the contractor or caused by the installation of faulty work by him shall be rejected. Such defects shall be rectified and /or glass shall be replaced by the Contractor at his own expense to the entire satisfaction of the Engineer – in – Charge. No delay or claim whatsoever of any kind shall be entertained from the contractor on this account.

25.5. Selection of Glass

i. Each type of glass shall be obtained from only one manufacturer and preferably in one lot.

ii. Insulated Glazed Units (igus) in the vision panels.

iii. Insulated glazed units shall be obtained only from approved manufacturers/ processors as per the approved list.

iv. Insulated units shall be factory assembled, with multiple panes, hermetically sealed, separated by and sealed to spacer tubes perforated on inner exposed face forming airtight dehydrated airspace inside the insulated units. The igus shall be assembled (prepared) by the manufacturer/ processor of the glass as per the approved list, in their dedicated workshops/ factory.

25.6. Laminating units

i. The glasses shall be laminated with interlayer of Polyvinyl butyral (PVB) sheet of specified thickness

ii. The interlayer material (PVB) shall be clear or as specified with no tendency to bubble, discolour or lose physical and mechanical properties after laminating glasses.

iii. The laminated panels shall be free of foreign substances, air or glass pockets and shall not delaminate at edges.

25.7. Precaution in storing and handling glasses.

i. The glass manufacturer/ processor shall take necessary precautions as stated below besides any other precautions not specifically mentioned herein:

ii. The reflective/ low E coating on the glass shall be protected against scratches, surface corrosion, staining and/ or any other abrasion.

iii. The glasses shall not be stored without a clean inter-leaving material. Also they should not slide against each other.

iv. The glass shall be protected from weld or grinding splatter.

v. The reflective/ low E coating shall be protected against contact with acids or strong alkalies. The cleaners to be used for cleaning the surface shall be as per the manufacturer's recommendations. The glass shall be protected against moisture from

humidity, which can stain glass as well as coating.

vi. Reflective/ low E coating shall also be protected against splashes from paints etc.

25.8. Metal coatings

i. Anodizing

ii. Aluminum extruded sections shall be satin finish colour anodized to minimum 20 microns thickness, as per the approved colour and shade or PVDF coil / spray coated to approved metallic colour and shade to minimum 35 microns thickness.

25.9. Galvanizing

i. The brackets for the curtain glazing system shall be hot dipped galvanized. The mass of the zinc coating to be not less than 610 gm. Per sqm of steel area to be galvanized.

25.10. Samples

i. The Contractor shall prepare three samples, which shall define the colour and gloss of anodizing and submit them for approval of the Engineer – in – Charge.

25.11. Matching of finish

i. Wherever the same colour finish is specified for extruded aluminium sections and composite aluminium sheets, the Contractor shall ensure that the colour of both is matched as closely as possible to the satisfaction of the Engineer – in – Charge.

25.12. Curtain glazing

General:

i. Movement of building components to which the curtain glazing system is attached including long term and short-term movements due to thermal effect, structural effect, wind pressure,

ii. Seismic forces, erection or dead loads, creep, column shortening, deflection, torsion and vibrations etc shall be free and noiseless. This shall be achieved without any strain or stress being transferred to the glass, without buckling of any components, without excessive stress to any members or assemblies and without compromising on any of the performance requirement of the curtain wall.

25.13. Waterproofing

i. Following precautions shall be taken by the contractor to ensure that the curtain glazing system is completely water tight during its guarantee period as well as expected service life besides any other precautions not specifically mentioned herein:

ii. A drainage system must be incorporated into the curtain glazing system. The curtain glazing system shall have provision for air pressure equalization (all the internal spaces shall be vented by acceptable means to ensure air pressure equalization) so thatwater leakage and condensation, if any shall be drained or discharged to exterior face of the curtain glazing.

iii. Care should be taken that the sections of the aluminum extrusions used for structural framing of curtain glazing provide for proper drainage of water that in- filters into the system by gravity and for this the section should have proper slope and weep holes as required. These shall be clearly indicated on the shop drawings.

iv. Movement of water on exposed faces must be controlled to ensure that water is not retained and that elements will not be damaged or corroded by water and to minimize the potential for algae and fungal growth as a result of standing or trapped water.

v. EPDM gaskets of the quality as specified and of required size and thickness shall be provided at all required locations to prevent ingress of water or moisture. The same shall be indicated on the shop drawings also.

vi. EPDM gaskets of the quality as specified and of required size and thickness shall be provided at all required locations to prevent ingress of water or moisture. The same shall be indicated on the shop drawings also.

vii. Aluminum sheet flashing using 1.0mm thick transparent anodized (10 microns) aluminium sheet wherever required shall be provided including sealing the gap between the flashing and the other material like RCC, masonry, aluminum etc. By using weather silicone sealant as specified.

25.14. Mullions and transoms

i. The sections of mullions and transoms shall be designed to restrict deflection under dead loads, wind load, seismic loads etc. As specified and shall be rigid and stable enough to support and retain the in-fill panels in position under all conditions. The mullions and transoms shall

ii. Also be designed for additional horizontal loads from the cleaning equipment and process besides horizontal live loads as specified.

25.15. Spandrel units

i. Spandrel shall be of glass having same colour matching with vision areas after using a shadow box as specified.

ii. Structural spandrel wall, fins, slab or beam, aluminium frame work, anchor fasteners, brackets, shadow boxes, fire stop(barrier)-cum-smoke seals and other construction shall not be visible through the glass in the spandrel portion of the curtain glazing from the exterior and shall be fully concealed behind the shadow box.

iii. A shadow box shall be provided at a distance of minimum 50 mm behind the spandrel glass panel to ensure that the insulation panel material does not come in contact with the soft coating of the spandrel glass to prevent any damage to the coating on account of any chemical reaction or otherwise. It shall consist of an approved black fibre glass non-woven tissue stuck on surface #1of 50 mm thick semi-rigid fibre glass wool insulation panel of minimum density of 48 kg per cum., and 1.5 mm thick transparent anodized (10 microns) solid aluminum sheet tray, on surface #2 by using suitable stainless steel rivets/ nuts, bolts and washers to hold the insulation panel in position. The periphery shall be properly sealed. Surface #1 shall be adequately protected against damage until spandrel glazing is done. Further, care shall be taken that the aluminum sheet backing of the shadow box does not heave or warp due to thermal stresses and/or its self-weight. Proper gaps at the edges of the tray shall be provided toaccommodate movements on account of thermal stresses besides making elliptical slots if required to facilitate movements. The shadow box shall be fixed to the structural framing of the curtain glazing by using stainless steel screws. The fixing arrangement shall be as per the approved shop drawings.

25.16. Ventilators, open able windows and doors

i. Ventilators, open able windows and doors shall be provided at positions as shown on the architectural drawings. The open able panels when in closed position shall remain watertight under all weather conditions and pass the water tightness tests as specified. Besides, the open able panels shall appear similar to the fixed ones from outside.

ii. All hardware and accessories shall be provided and fixed by the contractor and shall be as specified.

25.17. Coping and soffit trimmer.

i. All coping and soffit panels shall have aluminium structural frame fixed rigidly to the structure.
ii. Effective drainage system shall be provided to drain out the water that may penetrate through the joints, on to the exterior face of the curtain glazing.
iii. Coping and soffits shall be visibly flat in all lighting conditions.

25.18. FABRICATION

1. General

All assemblies shall be fabricated and assembled in accordance with the architectural/ approved shop drawings and as specified. Deviations of any nature shall not be permitted, without the approval of the PMC.

2. Workmanship

i. All work shall be performed by skilled workmen, specially trained and experienced in the applicable trades and in full conformity with the specifications and approved shop drawings.
ii. All work shall be carefully fabricated and assembled with proper and approved provisions for thermal expansion and contraction, other building movements, fabrication and installation tolerances and design criteria etc.
iii. All forming and welding operations shall be done prior to finishing, unless otherwise noted.
iv. All work shall be true to detail with sharp, clean profiles, straight and free from defects, dents, marks, waves or flaws of any nature impairing strength or appearance; fitted with proper joints and intersections and with specified finishes.

3. Shop assembly

i. As far as practicable, all fitting and fabrication work shall be done in the factory/ workshop.
ii. Work that cannot be factory/ workshop assembled shall be temporarily assembled in the factory/ workshop and marked for convenience of assembly at site. The units shall then be disassembled and assembled properly later in the building.
iii. All glazing shall be done in the factory/ workshop.
iv. Gaskets shall be pre-positioned in the factory/ workshop as far as possible.
v. Site work shall be kept to a minimum required.

4. Sleeves

i. Unless otherwise specified, all aluminium sleeves shall be extruded sections minimum 1.5 mm thick transparent anodized (10 microns) 200 mm long and width compatible with the section. It shall be provided on the junction of mullion and transoms and designed to accurately interlock with adjacent sections and incorporate serrated surfaces for the secure bedding of sealant between the parent metal and the sleeve wherever required as per the approved shop drawings.

5. Anchor fasteners

i. All anchor fasteners shall be of stainless steel (grade 316) with self locking devices, unless otherwise specified, and of sufficient size and strength to withstand the applicable design loads/ forces with factor of safety as specified for the various materials and of approved make as directed by the PMC. The spacing and quantities of fasteners shall be as required as per the approved shop drawings to secure or support the framing. Washers and/ or other accessory items shall be of the same material as the fasteners. All assembly fasteners shall betorque tightened to achieve the maximum torque tension in the fasteners.

ii. All fasteners shall be concealed unless otherwise shown or approved. Exposed fasteners shall be finished to match surrounding metal finish.

iii. All fasteners including washers and accessory items shall be scheduled and designated on the shop drawings showing designation, type, size including diameter and length, material, numbers and spacing etc.

6. Protection of metals

i. Protection against bimetallic corrosion shall be provided wherever dissimilar metals are in contact by using PTFE (Teflon) separators 0.80 mm thick.

ii. Extruded aluminium section of the structural framing of the curtain glazing system which is to be in contact with concrete, masonry, mortar or plaster shall have the contact surfaces protected by use of suitable separators wherever crevices betweenthe contact surfaces may entrap moisture and corrosive elements. All metals, except stainless steel and aluminium, which are to be in contact with concrete, masonry,mortar or plaster, shall have the contact surfaces protected with epoxy paint.

iii. The Contractor shall furnish a schedule of all protective coatings and related items along with the shop drawings, including the designation of area and/or specific locations, materials used, special instruction, specification data sheets, etc.

7. Welding

i. All welding in mild steel work shall be done by the inert gas shielded arc or fluxless resistant techniques and with electrodes and/ or by methods recommended by the suppliers of the metals being welded. Type, size and spacing of welds, shall be as shown on approved shop drawings.

ii. Welds behind finished mild steel surfaces shall be so done as to eliminate distortion and/ or discoloration on the finished side. Weld spatter and welding oxides on finished surfaces shall be removed by descaling and/ or grinding. Low heat filled welds using chill bar on finished side shall be used to eliminate dimpling, distortion and/ or discoloration on the finished or exposed surface. Plug, puddle or spot welding shall not be permitted. If weld beads are visible on exposed finished surfaces, the surfaces shall be ground and polished to match and blend with finish on adjacent parent metal.

iii. Structural welds shall be made by certified welders and shall conform to the general recommendations and regulations of AWS Specification D1.0-46.

iv. Dirt grease, lubricant, or other organic material shall be removed by vapour degreasing or suitable solvent.

v. Joints rejected because of welding defects may be repaired only by re welding. Defective welds shall be removed by chipping or machining. Flame cutting shall not be allowed.

vi. Where ever welding is done in proximity to glass or finished surfaces, such surfaces shall be protected from damage due to weld sparks, spatter or tramp metal.

vii. All welds shall be scheduled and designated on the approved shop drawings showing designation, type, size, spacing etc.

8. Soldering

i. Soldering and/or brazing, wherever required shall be done as recommended by the suppliers of the metals involved.

9. Execution

General

i. The architectural drawings supplied by the PMC shall be considered essentially schematic, except for profiles of exposed surfaces which shall be as indicated. If in exceptional cases, in the opinion of the contractor, a change of architectural profile is required in order to meet the specifications/ structural design requirement of the curtain wall, he shall submit a proposal for change with specific reasons for consideration and approval of the Engineer – in – Charge. No deviations from the architectural profiles of the building shall be permitted without prior approval by the Engineer – in – Charge. Nothing extra shall be payable on this account.

ii. The method of assembling, reinforcing and anchorage of the aluminium structural framing of the curtain glazing system, wherever indicated is schematic. Location and method of providing the same shall be responsibility of the Contractor, who shall design, assemble, reinforce and anchor to suit each specified condition in an acceptable manner, suiting main building structure.

iii. All parts shall be secured by concealed means. Screws/ fasteners exposed to view shall in general not be allowed unless otherwise approved on the shop drawings.

iv. All components shall be assembled, secured, anchored, reinforced, sealed and made weather tight in the manner as specified and as per the approved shop drawings. The structural framing shall not restrict movements within the curtain glazing system and also relative to building. The design should be such that it is able to absorb such movements without compromising the performance requirements of the curtain glazing system. Wherever possible, sealants shall be concealed.

v. Free and noiseless movement of all components of the curtain glazing system due to thermal, structural, seismic loads, wind load, or dead loads etc. Shall be achieved without strain to glass, without buckling of any components and without excessive stress to any members or assemblies.

vi. The entire curtain glazing system shall be assembled and installed so that there is no leakage into the building. All leakage, penetration of moisture into the system, and condensation shall be drained and discharged to the exterior face of the curtain glazing system. For this, effective air pressure equalization shall have to be designed and ensured while executing the curtain wall system.

vii. Movement of water within and on exposed surfaces shall be controlled to ensure that water is not retained and that elements will not be damaged or corroded by water and to minimize the potential for algae and fungal growth as a result of standing or trapping water.

10. Dimensions

i. The dimensions given on Architectural drawings are indicative to enable the contractor

for preparing his shop drawings. However, these drawings may require modifications based actual measurements on site. The contractor shall revise the drawings accordingly and submit the same for approval of the PMCin case of any discrepancy between measurements on site and in drawings. Nothing extra shallbe payable on this account.

11. Performance testing

i. **General:** The contractor shall obtain and submit to the Department the manufacturer's test certificate for various materials for compliance as per the manufacturer's specifications.

12. Site tests

i. The Contractor shall carry out site tests at his own cost to determine resistance to water leakage as per recommendations given in AAMA 501 for "Field Check of Metal Storefronts, Curtain Walls and Sloped Glazing Systems for Water Leakage."

ii. The test areas shall be selected by the Engineer – in - Charge at random in typical and non- typical locations, one for every 500 sqm. Approx. Of installed curtain glazing. In case of any test failing, more tests shall be conducted by the contractor at his own cost as per the directions of the Engineer – in - Charge. The work carried out under the test area which fails in site testing, shall be rejected and redone or remedial action shall be taken by the contractor to rectify the defects, whatever the case may be at his own cost,to the entire satisfaction of the PMC.

iii. Each test area shall be approx. 25 sq.m. Or less depending upon the size of the glazing panels provided in the building for which test is being conducted. The test area shall include vision (fixed and open able) and spandrel panels.

13. Installation

i. Workmanship: All work shall be performed by skilled workmen, especially trained and experienced in the applicable trades employed and in full conformity with specifications and approved shop drawings to execute the work in workman like manner.

14. Setting out

i. Bench marks for elevations and building line offset marks for alignment shall be established on each floor level by the contractor. Should any error be found in the alignment, the Contractor shall notify the Engineer – in - Charge in writing and installation work shall not proceed in the affected area until the errors have been corrected.

15. Prior inspection of the structure

i. After the setting out has been established and before beginning installation in any area, the Contractor shall examine all parts of the structure on which the curtain glazing system is to be placed. Should any conditions be found which, in his opinion, will prevent the proper execution of his work or endanger its permanency, he shall report such conditions in writing to the Engineer – in - Charge. Installation work shall not proceed in that area until such conditions are corrected or adjusted to the satisfaction of the Engineer – in - Charge. Nothing extra shall be payable in this account.

16. Workmanship

i. All parts of the curtain glazing system shall be erected true to plumb and in proper alignment and relation to established setting out, as shown on approved shop drawings.

17. Installation within and/or adjacent to concrete

i. Where work is to be installed within and/or adjacent to concrete, no component of the curtain glazing system other than built in anchor devices shall be put in place until the concrete work is completed and finished.

18. Anchorage

i. Anchorage of the curtain glazing system to the structure shall be by approved methods and in strict accordance with approved shop drawings. After the curtain glazing system is properly positioned and aligned, all connections so designated on approved shop drawings shall be rigidly fixed by welding or other positive means in addition to serrated brackets and washers.

ii. All components of the curtain glazing system including anchorage assemblies, shall receive a 100% inspection by the contractor. A check list shall be prepared and maintained by the contractor for entire execution of curtain glazing system work and submitted to the PMC after the completion of the work. It shall also be made available for inspection during the execution of the work.

19. Welding

i. All welding shall be done by skilled mechanics qualified or licensed in accordance with local building regulations. Welds and adjoining burnt areas in prime coated surfaces shall be thoroughly cleaned and painted with one coat of primer. Welds in galvanized steel shall be coated with two coats of zinc rich paint. Special care shall be taken to protect glass and other furnished surfaces from flame and welding spatter and toprevent fires.

20. Use of sealing materials

i. Sealing materials shall be used in strict accordance with the Manufacturer's printed instructions/ specifications and shall be applied only by workmen specially trained or experienced in their use. Before applying sealants, all mortar, dirt, dust, moisture and other foreign matters shall be completely removed from surfaces, it will contact. Adjoining surfaces shall be masked when required to maintain a clean and neat appearance. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

ii. The manufacturer(s) of the applicable materials shall, when required, render, technical assistance prior to the application of any sealant and witness the first application as well as periodic site inspections thereafter. The Contractor shall witness and document all inspections performed by the sealant manufacturer and provide close supervision of all workmen used to apply the sealant. The record so maintained shall be made available for the inspection of the PMC during execution of the work.

21. Tensioning of bolts

i. All bolts/ fasteners shall be correctly fixed /tensioned. The tension shall be specifiedon shop drawings. 100% of fasteners/ bolts shall be mechanically checked for correct tension by the contractor and the contractor shall maintain a check list in this regard which shall be made available for the inspection of the PMC during execution of the work.

22. Protection and cleaning

i. The Contractor shall adequately protect all aluminium sections, glazing, cladding sheets, components and accessories from damage during shipment, storage, erection and till the date of completion of the work and handing over the building to the Department by use of protective coverings of approved non-staining quality.

ii. At such time as may be directed by the Engineer – in - Charge, the Contractor shall remove all protective coverings and clean the surfaces. All cleaning agents to be used shall not cause any damage to the aluminium, glass, aluminum composite panel and coatings etc. Any defective material shall be replaced by the contractor at his own cost.

23. Performance guarantee

i. The contractor shall be solely responsible for the design including shop drawings and performance of the installed curtain glazing, aluminium composite panel cladding and aluminium work (PVDF coated), etc. The installations shall be guaranteed by the contractor during the guarantee period, against defective materials, workmanship, water tightness (wherever specified), structural design, performance requirementsand other requirements as given in the specifications. The contractor shall submit in the enclosed format a written guarantee for the same for a period of 10 years after the date of completion of the work.

ii. The Contractor shall indemnify the Department against all claims of whatsoever nature due to defective designing or non-performance during the 10 years Guarantee period. The provisions of this clause shall not in any way limit the rights of the PMC to take action under other clauses of the contract agreement.

iii. 1% (one percent) of the cost of the items under this sub-head shall be withheld from the bills towards guarantee as specified above. However, half of this amount (withheld) would be released after five years after the date of completion of the work, if the performance is satisfactory. The remaining withheld amount shall be released after 10 years after the date of completion of work, if the performance is satisfactory. If any defect is noticed during the guarantee period, it shall be rectified by the contractor within seven days of notice to the contractor, at least temporarily to the satisfaction of the PMC till the permanent rectification of the defects / replacement of defective materials are carried out by the contractor in maximum period of four months. If not attended to, the same shall be got done by the PMC through other agency at the risk and cost of the contractor. However, the amount withheld as guarantee can be released in full, if irrevocable bank guarantee or e-bank guarantee from Schedule / Nationalised Banks, of same amount, for ten years is submitted by the contractor to the PMC. The defects, if any, shall be rectified in a workmanlike manner, retaining the same aesthetics and other functional parameters ofthe original work.

FORM FOR GUARANTEE BONDS

GUARANTEE BOND FOR REMOVAL OF DEFECTS OF WATER PROOFING WORKS.

This Agreement made this_____day of_____two thousand and _____ between_____(Name of the contractor, hereinafter called the Guarantor on the one part) and IBC (hereinafter called the Government on the other part). WHEREAS this agreement is supplementary to a contract (hereinafter called the contract) dated _____and made between the GUARANTOR on the one part and the Government on the other part for construction_____(Name of the work) where by the GUARANTOR, *inter alia*, undertook to render the buildings and structures in the said contract recited completely water and leak proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said structures will remain water and leak proof for ten years from the date of completion of the work.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date of completion of the work as a whole.

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

(a) Misuse of roof shall mean any operation which will damage water proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof;
(b) Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby water proofing treatment is removed in parts;
(c) The decision of the PMC with regard to cause of leakage shall be final.

During this period of guarantee, the GUARANTOR shall make good all defects and in case of any defects being found, render the building water-proof at his cost to the satisfaction of the PMC, and shall commence the work for such rectification within seven days from the date of issue of the notice from PMC calling upon him to rectify the defects, failing which the work shall be got done by IBC through some other Contractor at the GUARANTOR'S cost and risk. The decision of the PMC as to the cost, payable by the Guarantor shall be final and binding.

That if the GUARANTOR fails to execute the necessary rectification of water proofing or commits breach there under, then the Guarantor will indemnify IBC and his successors against all loss, damage, cost expense or otherwise which may be incurred by him by reasons of any default on the part of GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and / or cost

incurred by the IBC the decision of the PMC will befinal and binding on the parties.

IN WITNESS WHEREOF these presents has been executed by the Obligator _____and by_____and for an on behalf of the IBC on the day, month and year first above written.

Signed, sealed and delivered by **OBLIGATOR** in the presence of:

1.

2.

SIGNED FOR AND ON BEHALF OF IBC BY…… in the presence of:

1.

2.

GUARANTEE BOND FOR REMOVAL OF DEFECTS IN CURTAIN GLAZING & OTHER RELATED WORKS.

This Agreement made this ____day of_____two thousand and _____ between_____(Name of the contractor, hereinafter called the Guarantor on the one part) and the IBC (hereinafter called the Government on the other part).

WHEREAS this agreement is supplementary to a contract (hereinafter called the contract) dated_____and made between the GUARANTOR on the one part and the Government on the other part for construction_____(Name of the work) where by the GUARANTOR, *inter alia*, undertook to carry out structural analysis and design, preparation of shop drawings, setting out, design, supply, fabrication, installation, aligning, fixing, protection and testing of the curtain glazing and other related works, all as specified and set out in the contract and as per the correct international / national standards.

AND WHEREAS THE GUARANTOR agreed to give a guarantee (for all works as stated above) for the following:

1. System

1.1 Structural design has been carried out for design loads, as specified, thermal stresses, building movements and the consequent deflections without compromising the performance characteristics.

1.2 That deflections in the framing members shall be within permissible limits as specified.

1.3 Structural stability, safety, integrity and required performances of the work for all design works and building movements as specified.

2. Material

2.1 Glass (single, laminated or DGUs) – Substrate, coatings, lamination of laminated glass, insulation of DGUs

2.2 Sealant – Material used, performance of sealant used, usage as per the requirement of structural design and functional requirement, compatibility with different substance and sealants, bite size, quality assurance during sealing of DGUs and fixing glass to glass and glass to the aluminium frame, etc.

2.3 EPDM / Silicone gaskets – for ozone resistance and other properties as specified etc.

2.4 Aluminium – material quality, tempering requirement, suitability of aluminium grade and anodizing etc.

2.5 Anchor fasteners – suitability and strength requirements as per manufacturers' specifications etc.

3. Performance

3.1 Water tightness, wherever specified in the Contract.

3.2 Workmanship

3.3 Integrity of system during movements within and relative to the building structure.

3.4 Indemnify the Department against all claims of whatsoever nature due to defective designing by the contractor, material & workmanship etc. and /or non- performance of the work during the guarantee period.

NOW THE GUARANTOR hereby guarantees that the work executed by him shall perform to the specified standards of quality and workmanship during the guarantee period of ten years to be reckoned from the date of completion of work.

During this period of guarantee, the guarantor shall make good all defects and if any defect is noticed during the guarantee period, it shall be rectified by the contractor within seven days of issue of notice to the contractor, at least temporarily, to the satisfaction of the PMC, till the permanent rectification of the defects / replacement of defective materials is carried out by the contractor, in maximum four months period, retaining same aesthetic and other functional parameters of the original work. If not attended to, the same shall be got done by the IBC through other agency at the risk and cost of the contractor which shall be final and binding on the contractor.

That if the Guarantor fails to execute the necessary rectification or commits breach there under, then the Guarantor will indemnify IBC and his successors against all loss, damage, cost expense or otherwise which may be incurred by him by reasons of any default on the part of GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and / or cost incurred by the Government, the decision ofthe PMC will be final and binding on the parties.

IN WITNESS WHERE OF these presents has been executed by the OBLIGATOR _____and by_____and for and on behalf of the IBC on the day month and year first above written.
SIGNED, SEALED AND DELIVERED by OBLIGATOR in the presence of:

1.
2.

SIGNED FOR AND ON BEHALF OF THE IBC BY_____in the presence of:
1.
2.

GUARANTEE BOND FOR REMOVAL OF DEFECTS OF ANTI TERMITE

Name of the Firm/Company and its address.
……,
Dear Sirs,
Pest Control Pre-Construction Anti-Termite Treatment Guarantee regarding.

We hereby certify that the foundation(s) and Structure(s) of the premises of the ..... Described in the schedule below, have been pre-treated by us against subterranean termite infestation in accordance with our procedure for pre- treatment set out in our letter(s) dated ..... And in accordance with the terms and conditions under which the said work has been awarded to us.

We hereby guarantee that the foundation(s) and structure(s) of the said premises of the .....Shall be safe against subterranean termite attack or infestation for a period of TEN YEARS from ……..... To. .....
In the event of the said structure(s) and foundation(s) of the premises of the. ..... Being or becoming subject to subterranean termite attack or infestation at any time during the guaranteed period of Ten years, we agree to carry out as often as it becomes necessary, at our cost and expense, all and every treatment that may be necessary to render the said foundations and structures free from such subterranean termite attack or infestation.

The question whether the foundation(s) and structure(s) of the premises are or become subject to subterranean termite attack or infestation and whether any anti- termite treatment is or has become necessary shall be decided by the .....and we agree that their decision in this regard shall be final and binding on us.

Yours faithfully

Signature:

Name of the Company:

Address:

Seal:

Compliance refered for GRIHA 5 star Rating

CRITERION 7:

Energy Optimization

Intent:

The intent of this criterion is to ensure that the projects are made energy-efficient by enhancing the envelope performance while also reducing energy consumption through installation of efficient equipment and lighting fixtures.

Maximum Points: 12

7.1 APPRAISAL

7.1.1 **Ensure that the project demonstrates compliance with the mandatory requirements of ECBC 2017 as per Appendix 3A, Table 1.**

- Mandatory

7.1.2 Ensure that the heat gain through the building envelope meets the GRIHA threshold for peak heat gain as per Table 3.2.

- 2 Points

Table 3.2 Threshold for peak heat gain (W/m²) for different building typologies

Operating hours	Daytime occupancy		24-hours occupancy					
	5 days a week		7 days a week					
Climate zone	Institu-tional	Office	Health-care Facility	Hospitality	Office	Residential	Retail	Transit Terminal
Composite	40	30	35	35	45	45	30	30
Hot and dry	40	40	35	35	45	45	30	30
Warm and humid	35	25	35	30	45	45	25	25
Moderate	30	25	35	25	35	35	25	30
Cold	30	30	40	40	30	30	25	60

7.1.3 Demonstrate that 100% of exterior lighting fixtures[4] (lamp + ballast) meet the luminous efficacy of 80 lm/W.

- 1 Point

[4] Special purpose lighting occasionally used as floodlights, stage lights, pool lights/underwater lights, etc., are exempted from the calculations as mentioned in Appraisal 7.1.3. However, please note that the façade lighting is not exempted.

7.1.4 Ensure that the project meets the GRIHA benchmark for EPI[5] as per Table 3.3.

- Mandatory

Table 3.3 GRIHA benchmark for EPI (kWh/m²/year) for different building typologies[6]

Operating hours	Daytime occupancy		24-hours occupancy					
	5 days a week		7 days a week					
Climate zone	Institutional	Office	Healthcare Facility	Hospitality	Office	Residential	Retail	Transit Terminal
Composite	90	90	250	275	225	70	225	300
Hot and dry	90	90	250	275	225	70	225	300
Warm and humid	90	90	275	275	225	70	225	300
Moderate	75	75	250	250	210	50	210	300
Cold	90	120	275	300	275	100	225	275

7.1.5 Ensure that the project demonstrates additional reduction from the GRIHA benchmark for EPI as per Table 3.4.

Table 3.4 Additional reduction from GRIHA benchmark for EPI

Reduction from GRIHA Benchmark for EPI (x)	Points
0% ≤ x < 10%	-
10% ≤ x < 20%	1
20% ≤ x < 30%	2
30% ≤ x < 40%	4
40% ≤ x < 50 %	6
x ≥ 50%	8

7.1.6 Ensure that the equipment installed within the project (whichever applicable as per Table 3.5) is either BEE-star labelled or of equivalent performance.

Table 3.5 List of BEE-star labelled equipment

Equipment	Star Labelled	3 Stars and Above
LED/TFL	Mandatory	1 Point
Unitary/Split air-conditioners		
Ceiling fans		
Geysers		
UPS		
Solid state inverters		

[5] EPI of a building is its annual energy consumption (includes only HVAC* and internal lighting load) per square metre of the building. While calculating the EPI of a building, inhabitable areas such as unconditioned basement, storage area, plant room, boiler room, etc., shall not be included.
The EPI can be determined by the formula, as given below:
EPI = Annual energy consumption in kWh/ Total built-up area in m² (excluding the inhabitable areas))
*HVAC load includes space cooling, space heating, heat rejection, ventilation load, pump and auxiliary load.

[6] For mixed-use buildings, the GRIHA benchmark for EPI can be obtained using the extrapolation method, as explained in Appendix 3B.

CRITERION 8:

Renewable Energy Utilization

Intent:

The intent of this criterion is to promote the use of renewable energy in the projects and, thereby, reduce the project's dependency on fuels derived from conventional sources.

Maximum Points: 5

8.1 APPRAISAL

Alternative 1

On-site and off-site renewable energy system[7]

8.1.1 Ensure installation of on-site and off-site renewable energy system to offset a part of the annual energy consumption of internal artificial lighting, HVAC, and domestic hot water systems as mentioned in Table 3.6.

Table 3.6 Point weightage for on-site and off-site renewable energy system installation

Daytime occupancy		24-hours occupancy						Points
5 days a week		7 days a week						
Institutional	Office	Healthcare Facility	Hospitality	Office	Residential	Retail	Transit Terminals	
5%	5%	1%	1%	1%	-	1%	1%	Mandatory
10%	10%	3%	3%	3%	10%	3%	3%	1
15%	15%	5%	5%	5%	15%	5%	5%	2
20%	20%	7%	7%	7%	20%	7%	7%	3
25%	25%	10%	10%	10%	25%	10%	10%	5

Alternative 2

Off-site renewable energy system

Note: This alternative can only be attempted by non-residential buildings.

[7] All renewable energy systems recognized by the MNRE can be accepted under this criterion post submission of relevant calculations, simulations, and other supporting documents.

CRITERION 9:

Low ODP and GWP Materials

Intent:
The intent of this criterion is to ensure the use of materials with low GWP and ODP in building insulation, HVAC, refrigeration equipment, and firefighting systems.

Maximum Point: 1

9.1 APPRAISAL

9.1.1 **Ensure that all the insulation used in the building envelope and for HVAC systems are CFC and HCFC free.**

- Mandatory

9.1.2 **Ensure that the refrigerant used in the HVAC systems and refrigeration equipment is CFC and HCFC free.**

- Mandatory

9.1.3 **Ensure that the fire suppression systems and fire extinguishers installed in the project are halon free.**

- Mandatory

9.1.4 Ensure that all the insulation used in the building envelope and for HVAC systems; refrigerant used in the HVAC systems and refrigeration equipment are HFC free.

- 1 Point

9.2 COMPLIANCE

9.2.1 Submit a narrative with date-stamped photographs highlighting the insulation and refrigerants used in different applications in the building to demonstrate compliance with Appraisals 9.1.1–9.1.4.

9.2.2 Submit technical specification sheets/brochures of the insulation, refrigeration equipment, and fire-fighting systems to demonstrate compliance with Appraisals 9.1.1–9.1.4.
OR
Submit a valid GRIHA Product Catalogue certificate as applicable for the products to demonstrate compliance with Appraisals 9.1.1–9.1.4.

9.2.3 Submit purchase orders reflecting the full quantities of insulation, HVAC systems, refrigeration equipment, and fire-fighting systems used in the project highlighting their respective types to demonstrate compliance with Appraisals 9.1.1–9.1.4.

CRITERION 10:

Visual Comfort

Intent:
The intent of this criterion is to ensure that visual comfort (daylighting and artificial lighting) is provided to the building occupants through an integration of active and passive design measures.

Maximum Points: 4

10.1 APPRAISAL

Daylighting

Demonstrate UDI or mean DA compliance as per the alternatives mentioned below.

Alternative 1

10.1.1 Ensure that the WWR does not exceed 60% and the vertical fenestration complies with minimum VLT of 0.27.

- Mandatory

10.1.2 Ensure that the project meets theSHGC compliance as per Table 4.2/weighted façade average SHGC for each orientation.

- Mandatory

Table 4.2 Maximum SHGC for vertical fenestration for different climate typologies (based on ECBC 2017, Clause 4.3.3, Tables 4–10)

	Composite	Hot and Dry	Warm and Humid	Moderate	Cold
Maximum SHGC non-North	0.27	0.27	0.27	0.27	0.62
Maximum SHGC North					
For latitude ≥ 15°N	0.5	0.5	0.5	0.5	0.62
For latitude < 15°N	0.27	0.27	0.27	0.27	0.62

OR

10.1.2 Use Tables 9 and 10 of SP 41 to design the shading device for all the windows.

OR

10.1.2 Conduct a solar path analysis for windows of AC as well as non-AC spaces, to ensure that they are completely shaded for the duration between 0900 hours on 15th March and 1500 hours on 15th September.

OR

10.1.2 Use any combination of the previously mentioned strategies to show compliance for 100% of fenestrations.

10.1.3 Ensure that the SRR does not exceed 5% and SHGC for skylights[2] does not exceed 0.35.

- Mandatory

10.1.4 Ensure that all habitable spaces[3] are within the illuminance levels of 100 lux – 2000 lux for the minimum percentage of floor area prescribed in Table 4.3 for 90% of the potential day-lit time in a year. UDI compliance can be demonstrated through simulation using validated software.

Table 4.3 UDI benchmarks for percentage of habitable areas for different building typologies (based on ECBC 2017, revised: April 2018, Clause 4.2.3, Tables 4-1)[4]

Healthcare Facility	Hospitality	Institutional	Office	Residential	Retail*	Transit Terminal** (only for airports and heliports)	Points
30%	45%	40%	40%	45%	10%	10%	Mandatory
40%	55%	50%	50%	55%	15%	20%	2
50%	65%	60%	60%	65%	20%	30%	4

* Retail spaces to be considered in the calculation: All regularly occupied spaces except retail shops with special display lighting requirement, for example, lobby areas, atriums, food courts, toilets, entryways, corridors, and other congregation/circulation spaces.

** In case of airports and heliports, all regularly occupied spaces must be considered for calculations except security checkpoints and retail shops that have special lighting requirement. For example, concourse, entryways, check-in counters, waiting areas, food courts, toilets, atriums, and other congregation/circulation spaces.

Alternative 2[5]

Demonstrate through simulation that the project meets mean DA requirement (<3000 lux) for 100% of the annual analysis hours for 100% of the habitable spaces.

- Mandatory

10.1.2. Demonstrate through simulation that the project meets mean DA requirement (>300 lux) for the percentage of annual analysis hours as listed in Table 4.4 for 100% of the habitable spaces.

Table 4.4 DA benchmarks for percentage hours exceeding 300 lux for different building typologies[6]

Healthcare Facility	Hospitality	Institutional	Office	Residential	Retail*	Transit Terminal** (only for airports and heliports)	Points
20%	25%	25%	25%	25%	5%	10%	Mandatory
25%	30%	50%	30%	30%	10%	20%	2 Points

[2] Skylights in temporary roof coverings or awnings over non-conditioned spaces are exempted from Appraisal 10.1.3.

[3] Habitable spaces are building spaces intended for continual human occupancy. Such spaces generally include areas used for living, sleeping, dining, and cooking, but do not include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.

[4] For mixed-use buildings, UDI benchmarks can be obtained using extrapolation.

[5] Grid size of 1 m × 1 m has to be used in DA simulation.

[6] For mixed-use buildings, DA benchmarks can be obtained using extrapolation.

Healthcare Facility	Hospitality	Institutional	Office	Residential	Retail*	Transit Terminal** (only for airports and heliports)	Points
30%	35%	60%	35%	35%	15%	30%	4 Points

Note: For residential buildings, DA limit is 100 lux.

*Retail spaces to be considered in the calculation: All regularly occupied spaces except retail shops with special display lighting requirement, for example, lobby areas, atriums, food courts, toilets, entryways, corridors, and other congregation/circulation spaces.

**In the case of airports and heliports, all regularly occupied spaces must be considered for calculations except security checkpoints and retail shops that have special lighting requirement, for example, concourse, entryways, check-in counters, waiting areas, food courts, toilets, atriums, and other congregation/circulation spaces.

Artificial Lighting

10.1.5. Demonstrate through simulation that the artificial lighting lux levels fall within limits (lower and higher range) as per recommended space/task specific lighting levels in NBC 2016, Part 8, Section 1, Table 4, and meet a minimum uniformity ratio of 0.4.

- Mandatory

10.2 COMPLIANCE

Daylighting

10.2.1 Submit drawings (.dwg format) consisting of floor plans, elevations, and sections and doors – windows schedule, skylight schedule highlighting the various shading devices installed in the building with 'North' direction marked.

10.2.2 Submit narrative detailing the alternative opted for and state the methodology used to demonstrate compliance.

10.2.3 Submit technical specification sheets/brochures for all glazing types highlighting their SHGC and VLT.

OR

Submit valid GRIHA Product Catalogue certificate as applicable for the product.

10.2.4 Submit purchase orders reflecting the full quantities of all glazing installed in the project.

10.2.5 Upload photographs with narrative of measures implemented.

Alternative 1

10.2.6 Submit WWR calculation for the entire building envelope along with drawings (.dwg format) highlighting the opaque, translucent, and transparent areas in the façade to demonstrate compliance with Appraisal 10.1.1.

10.2.7 Submit effective SHGC calculation as prescribed in ECBC 2017/weighted façade average SHGC calculation for each orientation to demonstrate compliance with Appraisal 10.1.2.

10.2.8 Submit the calculations detailing the SRR and SHGC for skylights to demonstrate compliance with Appraisal 10.1.3.

CRITERION 11:

Thermal and Acoustic Comfort

Intent:

The intent of this criterion is to ensure that occupants of the building are thermally and acoustically comfortable, which would subsequently benefit their health and well-being, and ascertain improved performance.

Maximum Points: 5

11.1 APPRAISAL

Thermal comfort

11.1.1 Demonstrate that the project meets the thermal comfort requirements for all regularly occupied spaces as specified below:

- Mandatory

Part 1: Air-Conditioned Spaces

Demonstrate that the spaces meet the thermal comfort requirements as per NBC 2016, ASHRAE 55, or the Indian Adaptive Comfort model, ensuring that the maximum number of unmet hours shall not exceed 300.

Part 2: Non-Air-Conditioned Spaces[7] (With Operable Windows)

Alternative 1

Demonstrate using simulation[8] that all habitable spaces meet the thermal comfort requirements as per NBC 2016, ASHRAE 55, or the Indian Adaptive Comfort model (refer to Appendix 1 of GRIHA v. 2015 abridged manual) for 90% of the occupied hours for buildings in composite, moderate, hot and dry, and cold climates, and 60% of the occupied hours for buildings in warm and humid climate.

Alternative 2

A. Demonstrate using at least seven strategies (as listed in Appendix 4A) that the exterior fenestration is designed taking into consideration the window orientation, size, placement, and shading design to facilitate wind flow into the interior spaces.

B. Demonstrate that the optimum size and number of fans are installed in rooms of different sizes in accordance with Appendix 4B, Tables 1 and 2.

[7] Non-air-conditioned spaces: Spaces in which the ventilation system relies on opening and closing of windows in the space to maintain the thermal comfort of the space rather than mechanical systems.

[8] Project team must submit the analysis using TRNSYS, Energy Plus, or CFD modelling to demonstrate thermal comfort compliance.

Part 3: Mixed-Mode Spaces[9]

Demonstrate using simulation that all habitable spaces meet the thermal comfort requirements as per NBC 2016, ASHRAE 55, or the Indian Adaptive Comfort model for 90% of the occupied hours for buildings in all climate typologies.

Acoustic comfort

11.1.2 Ensure that the outdoor noise levels are measured and adopt at least three of the following strategies, if the average outdoor noise level is above 70 dBA for conditioned buildings with sealed windows and 60 dBA for naturally ventilated and mixed-mode buildings to mitigate its effect on the indoor noise levels as per NBC 2016, Volume 2, Part 8, Section 4, Clause 3.4.3.3.

- 1 Point

- Interposing buffer zones in building plan
- Protection of habitable spaces by introduction of green belts (greater than 30 m with broad-leaved evergreen trees), public gardens, etc.
- In case of multiple buildings in a project, positioning a less vulnerable building closer to the noise sources than the vulnerable buildings
- Shading and screening by providing a solid barrier such as a wall
- Provision of adequate sound insulation in building envelope (walls and roofs)[10]

11.1.3 Demonstrate that indoor noise levels are within the acceptable limits as per NBC 2016, Volume 2, Part 8, Section 4, Clause 4.1, Table 4.

- 1 Point

11.2 COMPLIANCE

Thermal comfort

11.2.1 Submit drawings (.dwg format) highlighting the area distribution for air-conditioned, non-air-conditioned, and mixed-mode spaces within the project.

Part 1: Air-Conditioned Spaces

11.2.2 Submit simulation reports (input and output files) to demonstrate that thermal comfort conditions are met for the project.

11.2.3 Submit narrative stating the thermal comfort model being used and the total unmet hours for the project.

11.2.4 Submit SLD of high side and low side HVAC system with set-points for all seasons.

Part 2: Non-Air-Conditioned Spaces: Alternative 1

11.2.5 Submit simulation reports (input and output files) to demonstrate that thermal comfort conditions are met for the project.

11.2.6 Submit narrative stating the thermal comfort model being used and total unmet hours for the project.

Part 2: Non-Air-Conditioned Spaces: Alternative 2

11.2.5 Submit detailed narrative of the strategies adopted, and provide supporting calculations for an adequate window design.

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[9] Mixed-mode spaces: A hybrid approach to space conditioning that uses a combination of natural ventilation and mechanical systems. These buildings utilize mechanical cooling only when and where it is necessary to supplement the natural ventilation.

[10] Strategy is only applicable for conditioned buildings with non-operable windows.

CRITERION 12:

Indoor Air Quality

Intent:

The intent of this criterion is to encourage design and monitoring of ventilation systems such that the indoor air quality meets minimum requirement as recommended by the relevant standards. It also focuses on the conscious choice of strategies and products to control substances that produce harmful emissions in the habitable spaces.

Maximum Points: 6

12.1 APPRAISAL

12.1.1 Ensure that the minimum requirements of CPCB (NAAQS) for assessing the quality of fresh air are fulfilled.[12]

- 1 Point

12.1.2 Ensure that the minimum requirements of ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quantity (with errata), or NBC 2016, Volume 2, Section 5, for quantity of fresh air are met.

- 1 Point

12.1.3 Ensure continuous monitoring of CO, CO_2, temperature, and RH levels such that they meet the permissible thresholds as per ISHRAE standard 10001:2016, Table 6, for all habitable areas either at space level or at AHUs by installation of sensor(s) deployed with feedback system as per the alternatives mentioned in Table 4.5.

Applicability Check – If the project comprises of building/s with operable windows, then such building/s are exempted from Appraisals 12.1.1 and 12.1.2.

To exempt the project from Appraisals 12.1.1 and 12.1.2, please submit the following:

- Floor plans, building elevations, and window sections (.dwg format)
- Photographs clearly indicating that the windows installed in the building are operable

[12] Appraisal 12.1.1 shall cover treatment of outdoor air predominantly for PM_{10} and $PM_{2.5}$.

Table 4.5 Requirements of sensors/monitoring devices and display for maintaining good IAQ

Requirement	Alternative 1 (Space level)	Alternative 2 (AHU level)	Points
Sensors/ monitoring devices	Install one sensor for each space ≥30 m^2 and ≤100 m^2 For spaces >100 m^2, install additional sensor for every 100 m^2	Install one sensor at each AHU (return air duct)	1
Display	Install 1 digital display showing monitored values for CO, CO_2, temperature, and RH at each floor level (refuge areas) with permissible thresholds (as per Table 4.6) and clear visibility for all occupants.		1

Table 4.6 Permissible thresholds as per ISHRAE standard 10001:2016

Parameter	Threshold
CO	< 9 (ppm)
CO_2	Ambient + 500 (ppm)

12.1.4 Ensure that all interior wall and ceiling finishes such as primers, paints, putty, etc. have low VOC content as per Appendix 4C, Table 1 and are lead free.

- Mandatory

12.1.5. Ensure that all adhesives and sealants used have low VOC content as per Appendix 4C, Table 2 and 3 and that interior composite wood products do not have urea–formaldehyde as a bonding resin.

- 1 Point

12.1.6. Ensure improved indoor air quality by adopting a minimum of three strategies from the following list (refer to Appendix 4D)

- 1 Point

- Installation of indoor plants
- Promoting use of carpets and mats at all entrances
- Use of green cleaning products for housekeeping
- Installation of separate exhaust system for janitor/storage rooms for chemicals
- Installation of air curtains
- Air sanitization
- Demand control ventilation

12.2 COMPLIANCE

12.2.1 Submit documentation detailing the specifications of the filtration system to demonstrate that fresh air quality meets the minimum requirements of CPCB (NAAQS) to demonstrate compliance with Appraisal 12.1.1.

OR

Submit a valid GRIHA Product Catalogue certificate as applicable for the product demonstrating compliance with Appraisal 12.1.1.

12.2.2 Submit space-by-space heat load calculations highlighting the provision of sufficient fresh air in the HVAC system design as per the ASHRAE 62.1 or NBC 2016, Volume 2, Part 8, Section 3, Clause 6.3.1, Table 3, to demonstrate compliance with Appraisal 12.1.2.

APPENDIX

APPENDIX 4A: DESIGN STRATEGIES FOR NATURALLY VENTILATED BUILDINGS

Given below is a list of design strategies for natural ventilation by wind action that can be adopted to demonstrate compliance with Appraisal 11.1.1, Part 2, Alternative 2. These strategies are taken from NBC 2016, Volume 2, Part 8, Section 1, Clause 5.4.3.1.

1. A building need not necessarily be oriented perpendicular to the prevailing outdoor wind; it may be oriented at any convenient angle between 0° and 30° without losing any beneficial aspect of the breeze. If the prevailing wind is from East or West, the building may be oriented at 45° to the incident wind so as to diminish the solar heat without much reduction in the air motion indoors.
2. Maximum air movement at a particular plane is achieved by keeping the sill height of the opening at at least 85% of the critical height (such as head level) for the following recommended levels of occupancy:
   - For sitting on chair (0.75 m)
   - For sitting on floor (0.40 m)
3. For the normal-sized rooms with identical windows on opposite walls, the average indoor air speed increases rapidly by increasing the width of window up to at least two-thirds of the wall width; beyond that, the increase is in much smaller proportion than the increase of the window width.
4. The air motion in the working zone is the maximum when the window height is at least 1.1 m. A further increase in the window height promotes air motion at a higher level of window but does not contribute additional benefits as far as air motion in the occupancy zones in the buildings is concerned.
5. The greatest flow per unit area of openings is obtained by using inlet and outlet openings of nearby equal areas at the same level.
6. The total area of openings (inlet and outlet) should be at least 25% of the floor area; however, even under the most favourable conditions, the maximum average indoor wind speed does not exceed 40% of outdoor velocity.
7. The size of the inlet should be kept within at least 45% of the total area of openings.
8. In case of rooms with only one wall exposed outside, provision of two windows on that wall is preferred over a single window.
9. Windows located diagonally opposite to each other give a better performance than other window arrangements for most of the building orientations.
10. Provision of horizontal sashes inclined at an angle of 45° in an appropriate direction helps to promote the indoor air motion. Sashes projecting outwards are more effective than projecting inwards.
11. In the case of narrow buildings, cross ventilation can be obtained through one side of the building to the other (with single-loaded corridors) by the provision of large and suitably placed windows or a combination of windows and wall ventilators for the inflow and outflow of air.
12. A verandah opening on three sides is preferred since it causes an increase in the room air motion for most of the orientations of the building with respect to the outdoor wind.

13. Provision of a partition with spacing of 0.3 m underneath helps in augmenting air motion near floor level in the leeward compartment of wide-span buildings.
14. Air motion in two wings parallelly oriented to the prevailing breeze is promoted by connecting them with a block on downstream side.
15. In case of multiple buildings on-site, under the purview of the building owner, air motion in a building is not affected by constructing another building of equal or smaller height on the leeward side but it is slightly reduced if the leeward building is taller than the windward block.

APPENDIX 4B: OPTIMUM CEILING FAN SIZING

Table 1 Optimum size/number of fans for rooms of different sizes (based on NBC 2016, Volume 2, Part 8, Section 1, Clause 5.7.4)

Sr. No.	Room Width (m)	Optimum Size (mm)/Number of Fans for Room Length										
		4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	14 m	16 m
1	3	1200/1	1400/1	1500/1	1050/2	1200/2	1400/2	1400/2	1400/2	1200/3	1400/3	1400/3
2	4	1200/1	1400/1	1200/2	1200/2	1200/2	1400/2	1400/2	1500/2	1200/3	1400/3	1500/3
3	5	1400/1	1400/2	1400/2	1400/2	1400/2	1400/2	1400/2	1500/2	1400/3	1400/3	1500/3
4	6	1200/2	1400/2	900/4	1050/4	1200/4	1400/4	1400/4	1500/4	1200/6	1400/6	1500/6
5	7	1200/2	1400/2	1050/4	1050/4	1200/4	1400/4	1400/4	1500/4	1200/6	1400/6	1500/6
6	8	1200/2	1400/2	1200/4	1200/4	1200/4	1400/4	1400/4	1500/4	1200/6	1400/6	1500/6
7	9	1400/2	1400/2	1400/4	1400/4	1400/4	1400/4	1400/4	1500/4	1400/6	1400/6	1500/6
8	10	1400/2	1400/2	1400/4	1400/4	1400/4	1400/4	1400/4	1500/4	1400/6	1400/6	1500/6
9	11	1500/2	1500/2	1500/4	1500/4	1500/4	1500/4	1500/4	1500/4	1500/6	1500/6	1500/6
10	12	1200/3	1400/3	1200/6	1200/6	1200/6	1400/6	1400/6	1500/6	1200/7	1400/9	1400/9
11	13	1400/3	1400/3	1200/6	1200/6	1200/6	1400/6	1400/6	1500/6	1400/9	1400/9	1500/9
12	14	1400/3	1400/3	1400/6	1400/6	1400/6	1400/6	1400/6	1500/6	1400/9	1400/9	1500/9

Table 2 Additional requirements for energy savings (based on NBC 2016, Volume 2, Part 8, Section 1, Clause 5.7.4)

Requirement	Description
Capacity of a ceiling fan	The capacity of a ceiling fan to meet the requirement of a room with the longer dimension D metre should be about 55D m^3/min.
Height of fan blades	The height of fan blades above the floor should be (3H + W)÷4, where H is the height of the room and W is the height of work plane.
Minimum distance between fan blades	The minimum distance between fan blades and the ceiling should be about 0.3 m.
Regulators	Electronic regulators should be used instead of resistance-type regulators for controlling the speed of fans.
Ventilation zone	When actual ventilated zone does not cover the entire room area, then the optimum size of the ceiling fan should be chosen based on the actual usable area of the room, rather than the total floor area of the room. Thus, a small-sized fan could be chosen and energy saving could be achieved.

APPENDIX 4C: VOC LIMIT FOR COATINGS, ADHESIVES AND SEALANTS

A detailed list of the products containing VOCs is given in the following tables along with the limits of their VOC content. This list of products is indicative and not exhaustive.

Table 1 VOC limits for liquid coating

Paint Application	Type of Finish	VOC Limit (g/L)
Interior coatings	Flat	< 50
	Non-flat	< 150
Exterior coatings	Flat	< 200
	Non-flat	< 100
Anti-corrosive	Gloss/semi-gloss/flat	< 250

Table 2 VOC limits for adhesives

Architectural Adhesive Application	VOC Limit (g/L)
Wood flooring	100
Industrial/rubber flooring	60
Ceramic tiles	65
Structural glazing	100
Multi-purpose construction	70
Sub-floor	50
Wall boards/panels	50
PVC welding	285
Adhesive primer for plastic	250
Structural wood member	140
Sub-specific use metal to metal	30
Wood	30
Fibreglass	80
Plastic foam/porous materials (except wood)	50

Table 3 VOC limits for sealants

Sealant Application	VOC Limit (g/L)
Architectural/roadways	250
Single-ply roof material installation/repair	450
Other	420
Sealant primer application architectural non-porous	250
Sealant primer application architectural porous	775
Other sealant primer applications architectural	750

APPENDIX 4D: STRATEGIES FOR IMPROVED IAQ

Table 1 Suggestive strategies for improved IAQ for habitable spaces

Sr. No.	Strategy	Requirement
1	Installation of indoor plants	1% of carpet area to be covered by potted plants
2	Promoting use of carpets and mats at all entrances	To capture particulates from occupants' shoes at all regularly used entrance(s) to the project, including doors with pedestrian traffic only to/from terraces or patios (no traffic to/ from surrounding grounds), one of the following is installed and is maintained on a weekly basis Three level of mats Scraper mat: 6 ft Absorption mat: 6 ft Finishing mat: 8 ft
3	Use of green cleaning products for housekeeping	Policy/tenant agreement to be formulated elaborating use of green cleaning (green seal or equivalent rated and non-irritant) products in all regularly occupied spaces
4	Installation of separate exhaust system for janitor/storage rooms for chemicals	In conformity with ASHRAE 62.1(2016), Normative Index B, separation of exhaust outlets and indoor air intakes
5	Installation of air curtains	Air curtains to be installed at all major entrances and exits
6[13]	Air sanitization (filtration of microbes, Isolation systems, UVGI system, negative air ionization, etc.)	Air sanitation is the system of removing the impurities present in air inside the buildings to protect its occupants from infections. Sanitation of air is essential in enclosed places like in buildings which are conditioned and have non-operable windows to prevent the spread of infections.
7[14]	Demand control ventilation	Carbon dioxide or air quality sensors may be used to check the level of pollutants in the occupied space and indicate to the building management system to control the opening of outside air dampers, thereby effectively providing ventilation on demand. A demand-controlled ventilation system uses a variable speed drive based on the opening and closure of the fresh air dampers, controlled by the carbon dioxide sensors (refer to NBC 2016, Volume 2, Part 8, Section 3, Clause 11.5.4 and Part 11, Clause 11.6 a). A typical basement exhaust system may use a variable speed drive controlled by carbon monoxide sensors centrifugal/screw chillers with variable speed drives. Projects in composite climates with 24-hour working schedules may incorporate free cooling systems.

[13] Only applicable for air-conditioned spaces
[14] Refer to Footnote 13

CRITERION 18:

Organic Waste Treatment On-Site

Intent:

The intent of this criterion is to divert organic waste from landfill sites by adopting strategies for treating it on site and thereby mitigating its adverse effects on the surrounding environment.

Maximum Points: 2

18.1 APPRAISAL

18.1.1 Ensure that the organic waste generated on-site [from the building (as per Criterion 17) and landscape] is quantified, and adopt strategies to treat 100% organic waste on site to convert it into useable resources (manure, biogas, etc.).

– 2 Points

18.2 COMPLIANCE

18.2.1 Submit narrative detailing the design and sizing of the organic waste treatment system installed on-site along with supporting photographs.

18.2.2 Maintain logbooks highlighting the quantity of the by-product (compost/biogas) used onsite, which would be validated during the additional site visits.

18.2.3 In case of contractual tie-ups, submit a copy of challans/receipts demonstrating utilization of treated organic waste outside the site.

18.2.4 Submit site plan/building plan (.dwg format) highlighting the location of organic waste treatment plant on-site.

18.2.5 Submit purchase orders of the organic waste treatment system installed on-site.

18.2.6 Submit technical specification sheet/brochure specifying the capacity of the system along with its model number.

OR

Submit a valid GRIHA Product Catalogue certificate, as applicable for the product.

CRITERION 23:

Safety and Sanitation for Construction Workers

Intent:
The intent of this criterion is to ensure safe, healthy, and hygienic working and living conditions for construction workers involved in the project.

Maximum Points: 1

23.1 APPRAISAL

23.1.1 **Ensure compliance with the requirements of NBC, 2016 for all of the following:**

- Mandatory

Part 1: Provision of necessary safety equipment and safety measures for construction workers.
Part 2: Provision of clean drinking water, hygienic working and living conditions, and sanitation facilities for the workers.
Part 3: Provision of crèche facility for children of construction workers in case their families are allowed to work/live at the construction site.

23.1.2 Adopt any one measure out of the following for the construction workers on-site:

– 1 Point

- Provide a grocery store/canteen within the site premises.
- Organizes at least two events during the entire construction phase to create environmental awareness among the construction workers.

23.2 COMPLIANCE

23.2.1 Submit a tender document highlighting measures to be taken by the contractor during the construction phase to demonstrate compliance with Appraisals 23.1.1 and 23.1.2.

23.2.2 Submit drinking water test reports conducted periodically, demonstrating that the water provided to workers meets the relevant BIS drinking water norms.

23.2.3 Submit a narrative and date-stamped photographs ensuring the provision of crèche facility for the children of construction workers.

23.2.4 Submit a narrative and date-stamped photographs of the measures adopted by the contractor during the construction phase to demonstrate compliance with Appraisals 23.1.1 and 23.1.2.

CRITERION 24:

Universal Accessibility

Intent:
The intent of this criterion is to encourage adoption of measures that make the built-environment barrier free and accessible to all, including differently abled and elderly persons.

Maximum Points: 2

24.1 APPRAISAL

24.1.1 Ensure that the project complies with the provisions of Harmonised Guidelines and Space Standards for Barrier Free Built Environment for Persons with Disability and Elderly Persons, 2016 (Refer to Appendix 9A).

- 2 Points

24.2 COMPLIANCE

24.2.1 Submit drawings (.dwg format) demonstrating that the project incorporates design measures as per Harmonised Guidelines and Space Standards for Barrier Free Built Environment for Persons with Disability and Elderly Persons, 2016.

24.2.2 Upload photographs with descriptions of the measures implemented.

CRITERION 25:

Dedicated Facilities for Service Staff

Intent:
The intent of this criterion is to promote a better working environment for service staff by providing dedicated rooms (for resting) and toilets for them.

Maximum Points: 2

25.1 APPRAISAL

25.1.1 Ensure provision of dedicated rooms (for resting) for service staff on-site (Refer Appendix 9B).

- 1 Point

25.1.2 Ensure provision of toilets on-site for the service staff as per NBC 2016, Volume 2, Part 9, Section 2, Clause 4.2 (Refer to Appendix 9C).

- 1 Point

25.2 COMPLIANCE

25.2.1 Submit drawings (.dwg format) and date-stamped photographs highlighting the location of room/s and toilets for service staff to demonstrate compliance with Appraisals 25.1.1 and 25.1.2.

25.2.2 Submit calculations indicating the total number of service staff based on the building occupancy and the total number of water closets, washbasins, urinals provided for service staff demonstrating compliance with Appraisal 25.1.2.

CRITERION 26:

Positive Social Impact

Intent:

The intent of this criterion is to create healthy environment in and around the building by providing sufficient green spaces, minimizing exposure to tobacco smoke, and raising environmental awareness within the community.

Maximum Points: 3

26.1 APPRAISAL

Environmental awareness

26.1.1 Ensure that the project adopts at least one measure on-site to create environmental awareness amongst its users and visitors.

- 1 Point

26.1.2 Ensure that the project adopts at least one measure on-site/offsite to create environmental awareness amongst the general masses.

- 1 Point

Tobacco smoke control

26.1.3 Demonstrate that the project team implements tobacco smoke control measures in case of air-conditioned and non-air conditioned buildings as per the alternatives mentioned below:

- Mandatory

Alternative 1

Ensure that tobacco smoking is prohibited within the site premises.

Alternative 2

Ensure that designated smoking zone/s[1] is/are provided and the smoke is managed within a controlled environment (in case of air-conditioned buildings). Additionally, there must be restriction to smoking in public spaces.

26.1.4 Ensure that tobacco smoking is prohibited on-site during the entire construction phase.

- Mandatory

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26.1.5 Ensure that the per capita availability of green spaces[2] for the project site is more than GRIHA threshold of minimum 9 m^2 of green cover per capita

- 1 Point

[1] These designated zones must be placed preferably in the peripheral spaces of the buildings.

[2] Green space development does not include play areas, provision of landscape, sitting/resting area, softscaping, waterbodies, etc.

CRITERION 27:

Commissioning for Final Rating

Intent:
The intent of this criterion is to ensure that all electro-mechanical systems and their components are designed and installed according to the operational requirements of the owner.

Maximum Points: Zero

27.1 APPRAISAL

27.1.1 Ensure that third-party commissioning is conducted for the systems mentioned in Table 10.2.

- Mandatory

Table 10.2 Systems to be commissioned

System Type	Description
HVAC	• Air side: AHU, fan coil units, cassette units, floor-mounted units • Water side: Cooling towers, primary and secondary pumps and motors • Boilers: Service hot water, electric/gas/oil-based boilers
Lighting & Electrical	• All circuits, sensors (occupancy, day-lighting, etc.) • Transformers • DG set • LT panel • Renewable energy system
Water	• Domestic water pumps and motors • Sewage treatment plant
Waste	• Organic waste, composter • Vermicomposters • Garbage chute • Other mechanical waste disposal/treatment systems

27.1.2 Ensure that a commissioning plan is developed and implemented for the systems as given in Table 10.2. Additionally, maintain a record of finding logs and their rectification during the entire period of construction, installation, and functional testing of systems.

- Mandatory

CRITERION 28:

Smart Metering and Monitoring

Intent:
The intent of this criterion is to promote smart metering and monitoring of energy and water consumption of the project to analyse its performance.

Maximum Points: 6

28.1 APPRAISAL

28.1.1 Demonstrate compliance with the following source metering requirements as mentioned in Table 10.3.

- Mandatory

Table 10.3 Source metering requirements

Source	Description
Energy	Ensure regular monitoring of the project's energy consumption by installing digital meters at the following point sources at the project level for: • Utility grid • On-site renewable energy system • DG set, gas genset, etc. • Each building level (at each apartment level for residential and at each tenant level for retail and office buildings)
Water	Ensure regular monitoring of the project's water consumption by installing digital meters at the following point sources: • Municipal supply • Borewell • Treated water outlet from STP (Grey/Black) • Captured rainwater