ESTABLISHMENT-V
ICAR-NATIONAL DAIRY RESEARCH INSTITUTE
KARNAL-132001

TENDER NOTICE

F. No. 3-532/NAHEP/Hostel Work/2020-21/EV

Date 14.01.2022

Sealed tenders are invited for the civil and electrical works from Bidders upto 11:00 hrs on 14.2.2022 meeting the requisite requirements.

S. No.	Brief Description of the works	Approx. value of works (Rs. in Lakhs)	Period of Completion	Bid Security
1.	Providing one parking shed, one open sitting shed with PUF sheet roofing and SS furniture /railing, Aluminium frame/ wire mesh in balconies, Rain water harvesting system, paver block flooring, and other flooring /plastering /RCC repair works etc. of various hostels at ICAR-NDRI, Karnal	69,97,427/-	60 days	1,50,000/-

The Bid document is available on Institute website (www.ndri.res.in). Interested bidders can download the bid document and participate in the bid upto 11:00 AM of 14.2.2022.

14/01/22

Sr.Administrative Officer(E-V Section)

ICAR-NATIONAL DAIRY RESEARCH INSTITUTE, KARNAL
NATIONAL AGRICULTURAL HIGHER EDUCATION PROJECT
INVITATION FOR BIDS FOR CONSTRUCTION OF
CIVIL WORKS UNDER NATIONAL COMPETITIVE BIDDING

F. No. 3-532/NAHEP/Hostel Work/2020-21/EV Dated: _____

The Director, ICAR-NDRI, Karnal invites Bids for the **"Providing one parking shed,one open sitting shed with PUF sheet roofing and SS furniture/railing, Aumininum frame/wiremesh in balconies, Rain water harvesting system, paver block flooring, and other flooring/plastering / RCC repair works etc. of various hostels at ICAR-NDRI, Karnal"** as per time schedule given below:

NAME OF WORK	Providing one parking shed, one open sitting shed with PUF sheet roofing and SS furniture/railing, Aluminium frame/wire mesh in balconies, Rain water harvesting system, paver block flooring, and other flooring/plastering/RCC repair works etc. of various hostels at ICAR-NDRI, Karnal
PERIOD OF SALE OF BIDDING DOCUMENT	15.01.2022 To 14.02.2022
LAST DATE AND TIME FOR RECEIPT OF BIDS	14.02.2022, 11:00AM
TIME AND DATE OF OPENING OF BIDS	14.02.2022, 3:00PM
PLACE OF OPENING OF BIDS	Dr N.N. Dastur Auditorium of ICAR-NDRI, Karnal.
OFFICER INVITING BIDS	Abhishek Rana , Sr. Administrative Officer Establishment-V Section, ICAR-NDRI,Karnal-132001 Tel. Mob. No: 0184-2259486, 0184-2259035

ICAR-NATIONAL DAIRY RESEARCH INSTITUTE, KARNAL
NATIONAL AGRICULTURAL HIGHER EDUCATION PROJECT
INVITATION FOR BIDS FOR CONSTRUCTION OF CIVIL WORKS UNDER NATIONAL COMPETITIVE BIDDING

F. No. 3-532/NAHEP/Hostel Work/2020-21/EV Dated: _____

1. The Government of India has received a credit from the International Development Association / loan from the International Bank for Reconstruction & Development towards the cost of the National Agricultural Higher Education Project (NAHEP)Project and intends to apply a part of the funds to cover eligible payments under the contracts for construction of works as detailed below. Bidding is open to all bidders from eligible source countries as defined in the *IBRD Guidelines for Procurement.* Bidders from India should, however, be registered with the Government of India or other State Governments/Government of India, or State/Central Government Undertakings. Bidders are advised to note the minimum qualification criteria specified in Clause 4 of the Instructions to Bidders to qualify for the award of the contract.

2. The Director, ICAR-NDRI, Karnal invites bids for the construction of works detailed in the table. The bidders may submit bids for all of the following works.

3. Bidding documents (and additional copies) may be downloaded from the website of the Institute(www.ndri.res.in).

4. Bids must be accompanied by security of the amount specified for the work in the table below, drawn in favour of Bid security will have to be in any one of the forms as specified in the bidding document and shall have to be valid for 45 days beyond the validity of the bid.

5. Bids must be delivered to Office of Senior Administrative Officer, E-V(Co-ordination) Section, ICAR-NDRI, Karnal on or before.11:00 hours on 14.02.2022 and will be opened on the same day at.15:00 hours, in the presence of the bidders who wish to attend. If the office happens to be closed on the date of receipt of the bids as specified, the bids will be received and opened on the next working day at the same time and venue.

6. Other details can be seen in the bidding documents.

Sl. No.	Brief Description of the works	Approx. value of works (Rs. in Lakhs)	Period of Completion	Bid Security
1.	Providing one parking shed, one open sitting shed with PUF sheet roofing and SS furniture /railing, Aluminium frame/ wire mesh in balconies, Rain water harvesting system, paver block flooring, and other flooring /plastering /RCC repair works etc. of various hostels at ICAR-NDRI, Karnal	6997427/-	60 days	150000/-

4/1/22

Name: Abhishek Rana
Address: Sr. Administrative Officer
Establishment-V Section
ICAR-NDRI,Karnal-132001
Tel. Mob. No: 0184-2259486,
0184-2259035
Fax No. 0184-2250042

Instructions to Bidders

SECTION – A-General

1. Scope of Works

The Director, ICAR-NDRI, Karnal invites Bids for the **"Providing one parking shed,one open sitting shed with PUF sheet roofing and SS furniture/railing, Aumininum frame/wiremesh in balconies, Rain water harvesting system, paver block flooring, and other flooring/plastering / RCC repair works etc. of various hostels at ICAR-NDRI, Karnal"** as detailed in the table given below:-

Sl. No.	Brief Description of the works	Approx. value of works (Rs. in Lakhs)	Period of Completion
1.	Providing one parking shed, one open sitting shed with PUF sheet roofing and SS furniture /railing, Aluminium frame/ wire mesh in balconies, Rain water harvesting system, paver block flooring, and other flooring /plastering /RCC repair works etc. of various hostels at ICAR-NDRI, Karnal	6997427/-	60 ays

2. Source of Funds

- The Government of India has received a loan/credit from the International Bank for Reconstruction and Development/the International Development Association (hereinafter interchangeably called "the Bank") towards the cost of the National Agricultural Higher Education Project (NAHEP) Project and intends to apply a part of the funds to cover eligible payments under the contract for the Works. Payments by the Bank will be made only at the request ofthe borrower and upon approval of the Bank in accordance with the *Loan/Credit Agreement,* and will be subject in all respects to the terms and conditions of that Agreement. Except as the Bank may specifically otherwise agree, no party other than the borrower shall derive any rights from the *Loan/Credit Agreement* or have any rights to the loan/credit proceeds.

- The loan agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council, taken under Chapter VII of the Charter of the United Nations.

3. **Qualification of the bidder:** The bidder shall provide qualification information which shall include:-

a) Total monetary value of construction works performed for each year of the last 5 years.(2016-17,2017-18,2018-19,2019-20,2020-21).

b) Income tax clearance certificate from the concerned IT circle;-Scanned copy of ITR for the last three financial years i.e. 2018-19, 2019-20 & 2020-21.

c) Report on his financial standing; (Turnover for last 05 years) and Solvency certificate from bank;

d) information regarding any litigation or arbitration resulting from contracts executed by the Bidder in the last five years or currently under execution. The information shall include the names of the parties concerned, the disputed amount, cause of litigation, and matter in dispute.

e) experience in works of a similar nature and size for each of the last five years, and details of works under way or contractually committed; and clients who may be contacted for further information on those contracts.

4. **To qualify for award of the contract the bidder**:The bidder must provide the following qualification information and documents which shall include:

a) Should have satisfactorily completed as a prime contractor at least one similar work of value not less than Rs.56,00,000/- (Rupees fifty Six lakh) in the last Five years;

b) Should possess valid electrical license for executing building electrification works (in the event of the works being sub - contracted, the sub-contractor should have the necessary license);(Copy to be enclosed)

c) should possess required valid license for executing the water supply/sanitary works (in the event of the works being sub-contracted, the sub-contractor should have the necessary license); (Copy to be enclosed)

d) Enlistment/ registration certificate of contractor in the appropriate class of works withany Govt. Organization like CPWD/ PWD/ MES or PSUs

e) Copy of valid Electrical licence

f) Certificate of registration with the labour Department Haryana

g) Scanned copy of Firm's registration under Companies Act/ or any other Act,

h) Copy of the PAN No.,

i) Copy of the GST No.,

j) Bank details of the firm.

k) The scan copy of an undertaking stating that if the information/declaration/scanned documents furnished in respect of eligibility criteria are found to be wrong or misleading at any stage, the firm will be liable to punitive action.

l) The bidder should submit the Certificate of Non-Blacklisting/ Not Banned / Temporarily suspended by any Govt. Deptt./Organizations during last threeyears.

m) Copy of self declaration – No Blood relation with the NDRI official involved in handling the execution of work (scope of work) as mentioned in the bid.

n) Bid Acceptance Letter

o) Scanned copy of User List/Purchase Orders (As per condition 4(a) of its satisfactory completion of similar work during last five years. Completion certificates issued by the Officer of the Client department of the rank of Executive Engineer or equivalent will have to be furnished along with the application. The Completion Certificate must clearly indicate:

   i. The date of completion of work
   ii. Nature of work
   iii. That the work has been completed satisfactorily.

p) The Bidder must submit all the documents/ proofs/ testimonials/ certificates etc. as mentioned above with self-certification on each page.

q) The bidder will also be required to furnish either copy of applicable licence /registration or proof of applying for obtaining labour licence, registration with EPFO and ESIC and BOCW welfare board including provident fund code No . and programme chart time showing progress within the period specified. Also ensure the compliance of aforesaid provisions by the sub contractor, if any engaged by the contractor for the said work

5. . **Bid Price:**

a. The contract shall be for the whole works as described in the Bill of quantities, drawings and technical specifications. Corrections, if any, shall be made by crossing out, initialling, dating and re-writing.

b. All duties, taxes and other levies payable by the contractor under the contract shall be included in the total price. **GST@18% applicable**

c. The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

d. The rates must be quoted in Indian Rupees only in words and figures both

e. In the price bid, there shall be NO conditions whatsoever. In case any tenderer mentions any condition including conditional rebates in their price part, tender shall be rejected forthwith.

f. A tenderer will also not be allowed to withdraw or modify any condition at a time after the technical bids have been accepted and the decision to open the price bid has been taken by the ICAR-NDRI Karnal

5.1 Rates: Subject to the nomenclature of the item as per schedule of quantities, the Specification indicated in the tender documents, the rates quoted shall include all taxes (including works contract taxes), duties and levies and all charges for packing, forwarding, insurance, freight and delivery, watch and ward of all materials for the work at site, installation, testing, commissioning at site, cost of all materials including royalty and taxes if any, labour, sundry inputs, execution of work at all heights, levels, pattern and design for all leads, lifts and depths including overhead charges and contractor's profit. Nothing extra shall be paid on this account.

5.2 The contractor has to carry out routine & preventive maintenance for 12 months (Defect liabilities period) from the date of handing over. Nothing extra shall be paid.

5.3 Completeness of tender:

All sundry equipment, fittings, units assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all other item which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespectively of the whether such items are specifically mentioned in the tender document or not.

5.4Completion Period:

The completion period of 60 days- indicated in the tender document is for the entire work of planning, designing, supplying, installation, testing, commissioning and handing over of the entire system to the satisfaction of the Engineer-in-Charge.

6 Submission of Bid:

6.1 The bidder is advised to visit the site of works at his own expense and obtain all information that may be necessary for preparing the quotation.

6.2 Each bidder shall submit only one bid.

6.3. **Sealing and Marking of Bids:**The Bidder shall seal the original and a copy of the Bid in separate envelopes, duly marking the envelopes as "**ORIGINAL**" and "**COPY**". These envelopes (called as inner envelopes) shall then be put inside one outer envelope.

- The **inner and outer** envelopes shall be addressed to the Sr. Admn. Officer, E-V Section, ICAR-NDRI, Karnal and

- bear the following identification: Quotation for **"Providing one parking shed,one open sitting shed with PUF sheet roofing and SS furniture/railing, Aumininum frame/wiremesh in balconies, Rain water harvesting system, paver block flooring, and other flooring/plastering/RCC repair works etc. of various hostels at ICAR-NDRI, Karnal"** (as per enclosed bill of quantities)

- Do not open before dt: **at 03.00 PM** (time and date of quotation opening)
- In addition to the identification the inner envelopes shall indicate the name andaddress of the bidder to enable the bid to be returned unopened in case it is declared late.
- If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the bid.

6.4 The quotation submitted by the bidder shall comprise the following:-

(a) Quotation in the format given in Section-B
(b) Signed Bill of Quantities; and
(c) Qualification information form given in Section-B duly completed.

(d) All documents specified in section 3&4 above
(e) Every page of the bid/quotation must be signed by the bidder.
(f) The bidders are advised not to deviate from the technical specifications/ items, commercial terms and conditions of NIT like terms of payment, guarantee, arbitration clauses, escalation etc.
(g) The eligible bidders shall quote rates for all items of major component as well as for all items of minor component of work.

6.5 **Bids**/Quotations must be received in the office of the **Sr. Admn. Officer, E-V Section, ICAR-NDRI, Karnal** not later than the time and date given in the bidding document. If the specified date is declared a holiday, quotations shall be received upto the appointed time on the next working day.

6.6 Any quotation received by the **Sr. Admn. Officer, E-V Section, ICAR-NDRI, Karnal** after the deadline for submission of quotation will be rejected and returned unopened to the bidder.

7.Modification and Withdrawal of Bids

(i) Bidders may modify or withdraw their bids by giving notice in writing before the last date of the bid.Each Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and delivered, with the outer and inner envelopes additionally marked "**MODIFICATION**" or "**WITHDRAWAL**", as appropriate.
(ii) Withdrawal or modification of a Bid between the deadline for submission of bids and the expiration of the original period of bid validity may result in the forfeiture of the Bid security. Bidders may offer discounts to, or modify the prices of their Bids only by submitting Bid modifications in accordance with this clause, or included in the original Bid submission

8. **Bid Validity:**

Bids shall remain valid for a period not less than ninety days after the deadline date for bid submission. A bid valid for a shorter period shall be rejected by the Employer as non- responsive.In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security.

9. **Bid Security:**

The Bidder shall furnish, as part of his Bid, a Bid security of Rs.1,50,000/- table of IFB for this particular work. This bid security shall be in favour of The Director, ICAR-NDRI, karnal and may be in one of the following forms:

- a bank guarantee issued by a nationalized / Scheduled Bank located in India or a reputable Bank located abroad in the form given
- Certified cheque/ Bank draft/Letter of credit, in favour of ICAR-UNIT, NDRI

karnal payable at Karnal.

- Bank guarantees issued as surety for the bid shall be valid for 45 days beyond the validity of the bid.Any bid not accompanied by an acceptable Bid Security and not secured as indicated above shall be rejected by the Employer as non-responsive.

- The Bid Security of unsuccessful bidders will be returned within 28 days of the end of the bid validity period .

- The Bid Security of the successful bidder will be discharged when the bidder has signed the Agreement andfurnished the required Performance Security.

- The Bid Security may be forfeited
  (a) if the Bidder withdraws the Bid after Bid opening during the period of Bid validity;
  (b) if the Bidder does not accept the correction of the Bid Price, or
  (c) in the case of a successful Bidder, if the Bidder fails within the specified time limit to
    (i) sign the Agreement; or
    (ii) furnish the required Performance Security.

10. Opening of Bids:

Quotations will be opened in the presence of bidders or their representatives who choose to attend on the date and time and at the place specified in the letter of invitation.

11. Information relating to evaluation of quotations and recommendations for the award of contract shall not be disclosed to bidders or any other persons not officially concerned with the process until the award to the successful bidder is announced.

12. **Evaluation of Quotations**

The Employer will evaluate and compare the quotations determined to be substantially responsive i.e. which

a. meet the qualification criteria specified in clause 3&4 above;
b. are properly signed ; and
c. Conform to the terms and conditions, specifications and drawings without material deviations.
d. The ICAR-NDRI, Karnal reserves the right to reject any or all the price bids and call for fresh prices/ tenders as the case may be without assigning any reason.

13. **Award of contract**

The Employer will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price and who meets the specified qualification criteria.

13.1 Notwithstanding the above, the Employer reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.

13.2 The bidder whose bid is accepted will be notified of the award of contract by the Employer prior to expiration of the quotation validity period.

14. Payments to the second party for the construction work will be released by the first party in the following manner:-

Running Payment Bills as per the progress of work and recommendation of works committee.
Payments at each stage will be made by the first party:

a. on the second party submitting an invoice for an equivalent amount ;
b. on certification of the invoice by the engineer/ works committee nominated by the first party with respect to quality of works in the format in Annexure - 2; and
c. Upon proper and justified utilization of at least 50 % of the previous installment and 100 % of any prior instalment.

14.1 a. For deviation in items there is no change in quoted rates upto unlimited quantity as per site requirement

b. In case of extra items the payable rates shall be calculated on the basis of total % of rates above or below quoted by contractor on BOQ. The rates basis for extra item shall be based on DSR 2018 Items/Market Rate as per bill provided (The market rates of extra items shall be decided by the Institute's works committee by market quotation process).

15. **Performance Security:**

Within 21 days of receiving letter of acceptance, the successful bidder shall deliver to the **Sr. Admn. Officer, E-V Section, ICAR-NDRI, Karnal** the performance security (either a bank guarantee or a bank draft in favour of the Employer) for an amount equivalent of 5 %of the contract price. The Performance Security shall be valid till the expiry of the period of maintenance of the work.

13. **Period of Maintenance:**
The "Period of Maintenance" for the civil-works is twelve months-from the date of taking over possession or one full monsoon season whichever occurs later. During the period of maintenance, the contractor will be responsible for rectifying any defects in construction free of cost to the Employer.

14. Purchase of all construction materials including cement and steel as per the specifications (ISI certification marked goods wherever available) shall be the responsibility of the contractor.

15. For storage of sundry material and equipments if available or else the agency has to make his own arrangement. No separate storage accommodation shall be provided by the ICAR-NDRI, Karnal. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the work by the ICAR-NDRI, Karnal.

16. Power Supply: Electric service connection shall be provided by the institute for installation purpose through a submeter after a formal request and depositing security by the contractor and the contractor will be bound to pay electricity charges at the rates applicable to all other contractors as per actual consumption. Water Supply: Water supply shall be made available by the ICAR-NDRI, water charges will be charged @`1% of total cost.

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Note*: Engineer-in-charge: Maintenance Engineer

Commercial and Additional Conditions

1.0 Extent of work:

1.1 The work shall comprise of entire labor including supervision and all materials necessary to make a complete planning, execution & installation and such tests and adjustments and commissioning as may be required by the institute. The term complete installation shall not only mean major items of the plant and equipments covered by specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout charts whether or not those have been mentioned in details in the tender document in connation with this contract.

1.2 Minor building works necessary for installation of equipment, foundation, making of opening in walls or in floors and restoring to their original condition, finish and necessary grouting etc. as required.

1.3 Maintenance (Routine & preventive) for One year from date of completion and handing over.

2.0 Compliance With Regulations And Indian Standards

2.1 All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by these specifications. In particular, the equipment and installation will comply with the following:

(i) Factories Act.
(ii) Indian Electricity Rules
(iii) I.S. & BS Standards as applicable
(iv) Workmen's compensation Act
(v) CPWD Specifications 2019
(vi) Any other statutory approvals/norms as required

2.2 Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

2.3 Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and owners requirements of safety codes in respect of labour employed on the work by the tenderer.

3.0 Indemnity

The successful tenderer/ bidder shall at all times indemnify the **ICAR-NDRI, Karnal**, and consequent on this works contract. The successful tenderer/ bidder shall be liable, in accordance with the Indian Law and Regulations for any accident occurring due to any cause and the **ICAR-NDRI, Karnal** shall not be responsible for any accident or damage incurred or claims arising here from during the period of erection, construction and putting into operation the equipments and ancillary equipment under the supervision of the successful tenderer/ bidder in so far as the latter is responsible. The successful tenderer/ bidder shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer/ bidder due to the above.

4.0 Coordination with other agencies

The Contractor shall be responsible to coordinate the work with other agencies working at site. The Contractor shall have to carry out changes / modifications, if any, required due to lack of coordination with other agencies at his cost.

5.0 Insurance and storage:

All consignment are to be duly insured upto the destination from warehouse to site of work at the cost of the suppliers. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

6.0 Maintenance:

6.1 Sufficient trained and experienced staff shall be made available to meet any Exigency of work during the guarantee period of one year from the handing over of the installation.

6.2 The maintenance routine as well as preventive maintenance for one year from the date of taking over the installation as per manufacturer's recommendation shall be carried out and the record of the same shall have to be maintained.

7.0 Interpreting specifications

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

a) Bill of Quantity
b) Technical specifications
c) Drawings (if any)
d) General Specifications
e) Relevant IS or other international codes in case IS code is not available.

Additional Terms And Conditions

1. **Works to be done by the contractor:**

Unless and otherwise mentioned in the tender documents, the following works shall be done by the contractor, and therefore their cost shall be deemed to be included in their tendered cost:-

(i) Cutting and making good all damages caused during installation and restoring the same to their original finish.
(ii) Sealing of all floor openings provided by him for pipes and cables, from fire safety point of view, after laying of the same.
(iii) Painting at site of all exposed metal surfaces of the installation other than pre-painted items like fittings, fans, switchgear/distribution gear items, cubicle switchboard etc. Damages to finished surfaces of these items while handling and erection, shall however be rectified to the satisfaction of the Engineer-in-Charge.
(iv) Testing and commissioning of completed installation.
(v) Storage space for all equipments, components and materials for the work.

2. **Tools for handling and Erecting:**

All tools and tackles required for handling of equipments and materials at site of work as well as for their assembly and erection and also necessary test instruments shall be the responsibility of the contractor.

3. **Care of buildings:**

Care shall be taken by the contractor to avoid damage to the building during execution of his part of the work. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove, at his costs, all unwanted and waste materials arising out of his work, from the site.

4. **Structural Alterations to Buildings:**

(i) No structural member in the building shall be damaged/altered, without prior approval from the competent authority through the Engineer-n-charge.

(ii) Structural provisions like openings, cutouts, if any, provided by the department for the work, shall be used. Where these required modifications, or fresh provisions are required to be made, such contingent works shall be carried out by the contract at his cost.

(iii) All such openings in floors provided by the department shall be closed by the contractor after installing the cables/conduits/rising mains etc. as the case may be, by any suitable means as approved by the Engineerin- charge without any extra payment.

(iv) All chases required in connection with the electrical works shall be provided and filled by the contractor at his own cost to the original architectural finish of the buildings.

5. **General requirements of components:**

5.1. **Quality of material:** All materials and equipments supplied by the contractor shall be new. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.

6.0 **Inspection of materials and equipments:**

Adequate care to ensure that only tested and genuine materials of proper quality are used in work shall be ensured by firm. The firm shall ensure that:

(i) Inspection at factory or at godown of the manufacturer, if required, shall be arranged by the firm on a mutually agreed date. Certificate for genuineness of the material shall have to provide duly signed by the manufacturer's authorized representative.

(ii) Delivery of material shall be taken up only with the consent of department, after clearance of the material.

(iii) Department shall reserve the right to waive inspection in lieu of suitable test certificate, at its discretion.

7.0 **Conformity to standards:**

7.1. All components shall conform to relevant Indian Standard Specifications wherever existing. Materials with ISI certification mark shall be preferred.

7.2 Relevant Indian Standards including amendments or revisions thereof up to the date of tender acceptance shall be applicable in the respective contracts for respective items, firm to ensure its compliance.

8.Workmanship:

8.1. Good workmanship is an essential requirement to be complied with. The entire work of manufacture/fabrication,assembly and installation shall conform to sound engineering practice.

8.2. **Proper supervision/skilled workmen**: The contractor shall engage suitably skilled/licensed workmen of various categories for execution of work supervised by supervisors / Engineer of appropriate qualification and experience to ensure proper execution of work. They will carry out instruction of Engineer-in-charge and other senior officers of the Department during the progress of work.

8.3. **Use of quality materials:** Only quality materials of reputed make as specified in the tender will be used in work.

9.0 **Testing:**
All testes prescribed in this tender document, to be done before, during and after installation, shall be carried out, and the test results shall be submitted to the Engineer-in-charge in prescribed Performa, forming part of the Completion Certificate.

SAFETY CODES

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1(¼ horizontal and 1 vertical.)

2. Scaffolding of staging more than 3.6 m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

3. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.

4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm. (3ft.)
5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11½") for ladder upto and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least ¼" for each additional 30 cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit; action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.

6. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned.

7. An additional clause (viii) (i) of Central Public Works Department Safety Code (iv) the Contractor shall not employ women and men below the age of 18 on the work of painting with product containing lead in any form, wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use :
   i. White lead, sulphate of lead or product containing this pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.
   ii. Measures shall be taken, wherever required in order to prevent danger arising from the application of paint in the form of spray.
   iii. Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.
   iv. Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
   v. Overall shall be worn by working painters during the whole of working period.
   vi. Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.
   vii. Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man appointed by competent authority of NDRI KARNAL
   viii. NDRI KARNAL may require, when necessary medical examination of workers.
   ix. Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

8. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the standards laid down in the safety codes.

9. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

10. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

11. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer-in-Charge of the NDRI Karnal or their representatives.

12. Notwithstanding the above clauses, there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

LABOUR LAWS TO BE COMPLIED BY THE CONTRACTOR

The following Labour Laws to be complied by the Contractor

(Any failure to fulfil these requirements shall attract the penal provisions of this contract arising out of the resultant non-execution of the work.)

- The contractor shall obtain a valid licence under the Contract Labour (R&A) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.
- The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as defined as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the contract Labour (Regulation and Abolition) Central Rules,1971, wherever applicable.
- The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970, amended from time to time and rules framed there under and other labour laws affecting contract labour that may be brought into force from time to time.
- The contractor shall indemnify and keep indemnified Government against payments to be made under and for the observance of the laws aforesaid without prejudice to his right to claim indemnity from his subcontractors.

LAWS RELATED TO HEALTH & SAFETY

The Labor Management Plan outlines Environmental, Occupational Health & Safety and Social (OHSS) guideline, management system and governance controls on these issue for the implementation of NAHEP. Through this guideline and associated standard operating procedures, it has been intended to integrate the social, occupational health and safety principles of the National, and World Banks Social Standards guidelines with the working strategy of the project.

The AUs/Institutions shall ensure safety and health of the workers, compliance to the existing labor laws with respect to daily working hours, payment of wages, welfare and compensation etc. during construction of the infrastructure proposed under the project. The AUs with the guidance of PIU, NAHEP shall monitor the compliance by the contractor. The guidelines will broadly cover the following:

- Compliance with the provisions of the labor laws applicable to construction industry;
- Ensuring prohibition of the engagement of child labor;
- Location of labor camp, provision of sanitary facilities, drinking water etc.;
- Health and safety programs for the workers;
- Awareness on HIV/AIDS/ sexual health;
- Prevent the use of all forms of forced labor and child labor (no child below the age of 18 will be allowed to work in hazardous circumstances).
- Avoid discrepancy in wages to male and female workers for similar nature of works and
- Preference to the local laborers, women in construction works.

The health and safety related Acts and Rules applicable in the project activities have been summarized in the **Annexure - 1 below.**

The purpose of this LMP is to offer NAHEP's AUs the general and specific guidance for ensuring that all contractors / sub-contractors2 will be able to protect the workers' rights, health, safety, and security during the project implementation period. LMP sets the norms and regulations that will have to be respected by all contractors, which will work for NAHEP project. In, all the contractor(s) / sub-contractor(s) shall meet national legislation (as stated above), but not restricted to the following:

- Ensure that all workers on site are provided with information on their terms and conditions, including hours, wages, breaks and holidays, discipline, and termination procedures in a language they understand.
- The construction workforce has minimal impacts / no interface on the students and faculty by putting adequate barricading, signage boards, and other safety measures.
- Provide guidance / training on the detrimental effects of the abuse of alcohol and drugs and other potentially harmful substances and the risk and concerns relating to HIV/AIDS and of other health risk-related activities to workers.
- Provide training on gender-based violence to avoid sexual harassment of female students and faculty and other exploitative sexual relations.

- Ensure that all workers on site understand how to access an easily accessible, confidential process for making complaints/ grievances3 about their employment:

This will require establishing a coherent and integrated grievance mechanism for all workers engaged in the NAHEP project

In addition, there should be adequate provision/mechanisms for reporting cases of sexual harassment and abuse, with a time frame within these are addressed and resolved. This can be tied the internal complaints committee set up within the project

- Provision of facilities to workers such as provision of sanitary (separate toilets for men and women), portable water, first aid and medical facilities. – rest shed
- Development of workers accommodation plan that should consider aspects such as: i) the provision of minimum amounts of space required for each worker; ii) provision of sanitary (separate toilets for men and women), laundry and cooking facilities and potable water; iii) creche facility for small children of working women; iv) the location of accommodation in relation to the workplace; v) the provision of first aid and medical facilities.- Labor camp
- Maintaining discipline in the Camp. The contractor / sub-contractor will be responsible to ensure:
- workers shall abide by camp rules which includes a disciplinary process. Contractor/sub-contractor shall ensure adherence to the code of conduct by the workers in the camp.
- provide briefing to all migrated workers on camp rules, behavior between fellow workers and the students and faculty. The objective of this orientation will be to increase awareness about the institution, and cultural sensitivities.
- Emergency plans on health and fire safety are prepared for minimizing the accidental and intended critical situations, including a plan for fire safety, including training of workers, periodic testing and monitoring of fire safety equipment and periodic drills. Depending on the local context, additional emergency plans are prepared as needed to handle specific occurrences (earthquakes, floods, cyclones, etc.).
- Maintain a register on accidental incidents and actions taken to avoid similar situations.
- Each contractor/sub-contractor should develop a register for all their workers. This register should contain data such as: name, age, sex, hours worked, wages, payments (including overtime payments) made and any deductions made from their wages. The register should be in line with national requirements on registration of workers.
- Each contractor/sub-contractor should specify the minimum age for employment or engagement in connection with the project, which will be the age of 14.

A child over the minimum age (14) and under the age of 18 will not be employed or engaged in connection with the project in a manner that is likely to be hazardous or interfere with the child's education or be harmful to the child's health or physical, mental, spiritual, moral or social development.

Annexure - 1: Acts/ Laws related to health and safety
Labour Laws to be complied by the Contractor

S. No.	Acts/ Laws related to health and safety	Objectives	Applicability
1.	Minimum wages Act, 1948	The Minimum Wages Act, 1948 safeguards the interests of workers by providing fixation of minimum wages mainly focusing, e.g., The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act	In compliance with the Act, the wage to be paid to the laborers engaged in any civil work, supported under NAHEP shall not be less than the latest minimum wage fixed by the state.
2.	The Child Labor (Prohibition and Regulation Amendment Act, 2016	Ban of employment of children below 14 years in specific occupation and processes. • Lay down the procedure to decide modifications to the schedule of banned occupation and processes. • Regulate the conditions of work of children in employments where they are not prohibited for working.	Children below the age of 14 shall not be engaged in construction works as laborers, in hazardous works like handling pesticides, fertilizers etc. at participating institutions
3.	The Contract Labor (Regulation and Abolition) Act, 1070	To regulate the employment of contract laborers in certain establishments and to provide for its abolition in certain circumstances and for matters connected therewith.	The laborers hired by contractors for engaging in construction/up-gradation at institutions shall be provided with facilities like rest rooms, drinking water sanitary provisions, first aid box etc.
4.	Equal Remuneration Act, 1976	To provide for the payment of equal remuneration to men and women workers and for the prevention of discrimination, on the ground of sex, against women in the matter of employment and for matters connected therewith or incidental thereto.	Women engaged in the activities supported by the project should be paid at par with their male counterparts
5.	The Building and Other Construction	To regulate the employment and conditions of services of	The Act shall be applicable to the

	Workers Related Laws(Amendment) Bill, 2013:	building and other construction workers and to provide their safety, health and welfare measures and for other matters connected therewith or incidental thereto.	contractors to be engaged for the construction/ expansion of buildings and other infrastructure
6.	Workmen's Compensation Act, 1923 (Amended 2009)	Provides for compensation in case of injury by accident arising out of and during the course of employment	The Act shall be applicable to the contractors to be engaged for the construction/ expansion of buildings and other infrastructure
7	The Bonded Labor (Abolition) Act 1976	An Act to provide for the abolition of bonded labor system with a view to preventing the economic and physical exploitation of the weaker sections of the people and for matters connected therewith or incidental thereto	Applicable to the contractors to be engaged under the project

The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

Requirement of Technical Representative(s)

For Civil Works:

S. No.	Minimum Qualification of Technical Representative	Discipline	Designation	Minimum Experience	Number	Rate at which recovery shall be made from contractor in the event of non-deployment.	
						Figures	Words
1	Graduate Engineer or Diploma Engineer	Civil	Project Manager Cum Planning/Quality/Site /Building Engineer	2 Years or 5 Years respectively	1 No.	15000/- per month	Rs. Fifteen Thousand Rupees Only per month

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

Diploma holder with minimum 10 years relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers. The contractor shall submit a certificate of such employment of the technical representative(s) (in the form of copy of Form-16 or CPF deduction issued to the Engineers employed by him) along with every account bill/final bill and shall produce evidence if at any times so required by the Engineer-in-charge.

TABLE OF MILE STONE (S)

Name of work: Providing one parking shed, one open sitting shed with PUF sheet roofing and SS furniture /railing, Aluminium frame/ wire mesh in balconies, Rain water harvesting system, paver block flooring, and other flooring /plastering /RCC repair works etc. of various hostels at ICAR-NDRI, Karnal

Time Period allowed for Completion of Work: - 60 days

Financial Terms

SI No.	Financial Progress	Time Allowed (from date of start)	Amount to be withheld in case of non achievement of milestone
1	1/8th (of Whole work)	1/4th (of whole time)	In the event of not achieving the necessary progress as assessed from the running payments 1% of the tendered value of work will be withheld for failures of each milestone
2	3/8th (of Whole work)	1/2th (of whole time)	
3	3/4th (of Whole work)	3/4th (of whole time)	
4	Full	Full	

SECTION - B

1. Format for Qualification Information.
2. Format for Submission of Quotation.
3. Format of Letter of Acceptance.
4. Self-Declaration – No Blacklisting
5. Self-Declaration – No Blood Relation
6. Undertaking
7. Declaration – Registration With Labour Department
8. Format of certificate
9. Bid Acceptance Letter
10. Draft Agreement Form (Articles of Agreement)

QUALIFICATION INFORMATION

1. **For Individual Bidders**

1.1 Principal place of business: _____

Power of attorney of signatory of Quotation.
[Attach copy]

1.2 Total value of Civil Engineering construction work performed in the last three years (in Rs. Lakhs)
20___ _____
20___ _____
20___ _____

1.3 Work performed as prime contractor (in the same name) on works of a similar nature over the last three years.

Project Name	Name of Employer	Description of work	Contract No.	Value of contract (Rs. Lakhs)	Date of issue of work order	Stipulated period of completion	Actual date of completion	Remarks explaining reasons for delay and work completed

Existing commitments and on-going works:

Description of Work	Place & State	Contract No. & Date	Value of contract (Rs. Lakh)	Stipulated period of completion	Value of works* remaining to be completed (Rs. Lakhs)	Anticipated date of completion
1	2	3	4	5	6	7

* Enclose a certificate from Engineer concerned

1.4 proposed subcontracts firms involved.

Sections of the works	Value of Sub-contract	Sub-contractor (Name & Address)	Experience in similar work

1.5 Evidence of access to financial resources to meet the requirements of working capital: cash in hand, lines of credit, etc. List them below and attach copies of support documents.

1.6 Name, address, and telephone, telex, and fax numbers of the Bidders' bankers who may provide references if contacted by the Employer.

1.7 Information on litigation history in which the Bidder is involved.

Other Party(ies)	Employer	Cause of dispute	Amount Involved	Remarks showing present status

QUOTATION

*

Description of the Works : **"Providing one parking shed,one open sitting shed with PUF sheet roofing and SS furniture/railing, Aumininum frame/wiremesh in balconies, Rain water harvesting system, paver block flooring, and other flooring/ plastering/RCC repair works etc. of various hostels at ICAR-NDRI, Karnal"**

To:

Sr. Admn. Officer,
E-V Section,
ICAR-NDRI, Karnal- 132001

Subject: Construction of .....

Reference: BID refenrence No.....dated.....from.....

Sir,

We offer to execute the Works described in your letter referred to above in accordance with the Conditions of Contract enclosed therewith at ..... percentage above / below the estimated rates, i.e., for a total Contract Price of -

Rs.** _____ [in figures] Rs.
_____ [in words].

Note: The Rates quoted above are including of GST @18% and all other taxes, levies and cess as applicable.

This quotation and your written acceptance of it shall constitute a binding contract between us. We understand that you are not bound to accept the lowest or any quotation you receive.

We hereby confirm that this quotation is valid for 45 days as required in Clause 6 of the Instructions to Bidders.

Yours faithfully,

Date:

Authorized Signature : _____

Name & Title of Signatory * : _____

Name of Bidder : _____

Address : _____

* To be filled in by the Employer before issue of the Letter of Invitation.

* To be filled in by the Bidder, together with his particulars and date of submission at the bottom of this Form.

LETTER OF ACCEPTANCE
CUM NOTICE TO PROCEED WITH THE WORK

(LETTERHEAD OF THE EMPLOYER)

Dated : _____

To : _____ [Name and address of the Contractor]
_____
_____
_____

Dear Sirs,

This is to notify you that your Bid/Quotation dated _____ for execution of the _____ for the contract price of Rupees _____ [amount in words and figures], is hereby accepted by us.

You are hereby requested to furnish performance security for an amount of Rs. _____ (equivalent to 5% of the contract price) within 21 days of the receipt of the letter. The Performance Security in the form of Bank guarantee or a Bank draft in favour of .....(Employer) shall be valid till the expiry of the period of maintenance i.e. upto _____. Failure to furnish the Performance Security will entail cancellation of the award of contract.

You are also requested to sign the agreement form and proceed with the work not later than _____ under the instructions of the Engineer, _____ and ensure its completion within the contract period.

With the issuance of this acceptance letter and your furnishing the Performance Security, contract for the above said work stands concluded.

Yours faithfully,

Authorized Signature
Name and title of Signatory

SELF-DECLARATION – NO BLACKLISTING

The Director,
ICAR-NDRI,
Karnal.

Dear Sir/Madam,

Ref: Tender for _____at ICAR-NDRI, Karnal.

In response to the Tender Document for_____, I/ We hereby declare that presently our Company/ firm _____ is having unblemished record and is not declared ineligible for corrupt & fraudulent practices either indefinitely or for a particular period of time by any State/ Central Government/ PSU/Autonomous Body. We further declare that presently our Company/ firm _____ is not blacklisted/debarred and not declared ineligible for reasons other than corrupt & fraudulent practices by any State/ Central Government/ PSU/ Autonomous Body on the date of Bid Submission. If this declaration is found to be incorrect then without prejudice to any other action that may be taken, my/ our security may be forfeited in full and the tender if any to the extent accepted may be cancelled.

Thanking you,

Yours faithfully,

Date.....

Place.....

Signature.....

Name.....

Seal of the organization

SELF-DECLARATION – NO BLOOD RELATION

The Director,
ICAR-NDRI,
Karnal.

Dear Sir/Madam,

Ref: Tender for at ICAR-NDRI, Karnal.

In response to the Tender Document for_____, I/ We hereby declare that no near relative is posted as Accountant or as an officer in any capacity as Engineer. If this declaration is found to be incorrect then without prejudice to any other action that may be taken, I may be debarred from tendering for any breach of this condition.

Thanking you,

Yours faithfully,

Date.....

Place.....

Signature.....

Name.....

Seal of the organization

UNDERTAKING

The Director,
ICAR-NDRI,
Karnal.

Dear Sir/Madam,

Ref: Tender for _____ at ICAR-NDRI, Karnal.

In response to the Tender Document for _____ at ICAR-NDRI, Karnal. I/ We hereby declare that if the information/declaration/scanned documents furnished in respect of eligibility criteria are found to be wrong or misleading at any stage, the firm will be liable to punitive action

Thanking you,

Yours faithfully,

Date.....

Place.....

Signature.....

Name.....

Seal of the organization

Format of certificate

Certified that the works upto ---------- level in respect of construction of ---------- at ---------- have been executed in accordance with the approved drawing and technical specifications.

Signature
Name & Designation
(Official address)

Place :

Date :

Office seal

BID ACCEPTANCE LETTER

I /We have read and examined the invitation for bid, Bidding data, Specifications applicable. Drawings & Designs, 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 Bidding document for the work.

I / We hereby tender for the execution of the work specified for the President of India within the time specified in Bidding data, viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions given to Bidders of the contract and with such material as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

We agree to keep the bid open for Ninety days from the date of submission thereof and not to make any modifications in its terms and conditions. If I fail to commence work as specified, I /We agree that President of India or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance guarantee absolutely.

I /We hereby declare that I /we shall treat the Bidding 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.

Signature of the Contractor

Postal Address

Dated _____

Witness:1.

2. .....

Draft Agreement form for
Construction through National Shopping

ARTICLES OF AGREEMENT

1. This deed of agreement is made in the form of agreement on _____ day _____ month _____ 2021, between The Director, ICAR-NDRI, Karnal (Employer) or his authorized representative (hereinafter referred to as the first party) and _____ (Name of the Contractor), S/O _____ resident of _____ (hereinafter referred to as the second party), to execute the work of construction of _____ (hereinafter referred to as works) on the following terms and conditions.

2. Cost of the Contract

The total cost of the works (hereinafter referred to as the "total cost") is Rs. ____ as reflected in Annexure - 1.

3.

3.1 Payments under its contract:

Payments to the second party for the construction work will be released by the first party in the following manner:-

Running Payment Bills as per the progress of work and recommendation of works committee.

3.2 Payments at each stage will be made by the first party:

a. on the second party submitting an invoice for an equivalent amount ;
b. on certification of the invoice by the engineer/ works committee nominated by the first party with respect to quality of works in the format in Annexure - 2; and
c. Upon proper and justified utilization of at least 50 % of the previous installment and 100 % of any prior installment.

3.3 The quantity of items may vary (i.e. minimum or maximum) of estimated quantity. The payment to the second party shall be released on the basis of actual quantity of the work executed by second party as per site requirements

The works contract tax/ labour welfare cess shall be deducted from the bills of the contractor as applicable in the state in which the the work is carried out, at the time of payments.

4. Notice by Bidder to Official(s) nominated by the Director ICAR-NDRI

The second party, on the works reaching each stage of construction, issue a notice to the first party or the Engineer-in-charge nominated by the first party (who is responsible for supervising the contractor, administering the contract, certifying the payments due to the contractor, issuing and valuing variations to the contract, awarding extensions of time etc.), to visit the site for certification of stage completion. within 15 days of the receipt of such notice, the first party or official(s) nominated by the Director ICAR-NDRI , will ensure issue of stage completion certificate after due verification

5. **Completion time:**
The works should be completed in **60 days** from the date of this Agreement. In exceptional circumstances, the time period stated in this clause may be extended in writing by mutual consent of both the parties.

6. If any of the compensation events mentioned below would prevent the work being completed by the intended completion date, the first party will decide on the intended completion date being extended by a suitable period :

(a) The first party orders a delay or does not issue completed drawings, specifications or instructions for execution of the work on time.

(b) Ground conditions are substantially more adverse than could reasonably have been assumed before issue of letter of acceptance and from information provided to second party or from visual inspection of the site.

(c) Payments due to the second party are delayed without reason.

(d) Certification for stage completion of the work is delayed unreasonably.

(e) The First party does not give access to the site or a part thereof by the agreed period.

7. Any willful delay on the part of the second party in completing the construction within the stipulated period will render him liable to pay liquidated damages. @ Rs. *_____ per day which will be deducted from payments due to him. The first party may cancel the contract and take recourse to such other action as deemed appropriate once the total amount of liquidated damages exceeds 2 % of the contract amount.

(Note: The amount of liquidated damages per day should be determined at 0.05% of the contract value of the works and indicated here).

8. **Duties and responsibilities of the first party**

8.1 The first party shall be responsible for providing regular and frequent supervision and guidance to the second party for carrying out the works as per specifications. This will include written guidelines and regular site visit of the authorized personnel of the first party, for checking quality of material and construction to ensure that it is as per the norms.

8.2 Possession of the site will be handed over to the second party within 10 days of signing of the agreement.

8.3 The Engineer-in-charge or such other person as may be authorized by the first party shall hold meeting once in a month where the second party or his representative at site will submit the latest information including progress report and difficulties if any, in the execution of the work. The whole team may jointly inspect the site on a particular day to take stock of activities.

8.4 The Engineer-in-charge / Institute's works committee shall record his observations/instructions at the time of his site visit in a site register maintained by the second party. The second party will carry out the instructions and promptly rectify any deviations pointed out by the Engineer-in-charge. If the deviations are not rectified, within the time specified in the Engineer-in-charge's notice, the first party as well as the engineer nominated by it, may instruct stoppage or suspension of the construction. It shall thereupon be open to the first party or the Engineer-in-charge to have the deviations rectified at the cost of the second party.

9. Duties and responsibilities of the second party

9.1 The second party shall:

a. take up the works and arrange for its completion within the time period stipulated in clause 5;
b. employ suitable skilled persons to carry out the works ;
c. regularly supervise and monitor the progress of work ;
d. abide by the technical suggestions / direction of supervisory personnel including engineers etc. regarding building construction ;
e. be responsible for bringing any discrepancy to the notice of the representative of the first party and seek necessary clarification :
f. ensure that the work is carried out in accordance with specifications, drawings and within the total of the contract amount without any cost escalation ;
g. keep the first party informed about the progress of work ;
h. be responsible for all security and watch and ward arrangements at site till handing over of the building to the first party ; and
i. maintain necessary insurance against loss of materials/cash, etc. or workman disability compensation claims of the personnel deployed on the works as well as third party claims.

j. Pay all duties, taxes and other levies payable by construction agencies as per law under the contract (First party will effect deduction from running bills in respect of such taxes as may be imposed under the law).

10. Variations / Extra Items:

The works shall be carried out by the second party in accordance with the approved drawings and specifications. However, if, on account of site conditions or any other factors, variations are considered necessary, the following procedure shall be followed:-

a. The second party shall provide the official(s) nominated by Director,ICAR- NDRI with a quotation for carrying out the Variation when requested to do so by the the official(s) nominated by Director,ICAR- NDRI. The the official(s) nominated by Director,ICAR- NDRI shall assess the quotation, which shall be given within seven days of the request before the Variation is ordered.

b. If the quotation given by the second party is unreasonable, the the official(s) nominated by Director,ICAR- NDRI may order the Variation and make a change to the Contract Price which shall be based on the official(s) nominated by Director,ICAR- NDRI own forecast of the effects of the Variation on the Contractor's costs.

c. The second party shall not be entitled to additional payment for costs which could have been avoided by giving early warning.

d. For deviation in items there is no change in quoted rates upto unlimited quantity as per site requirement

e. In case of extra items the payable rates shall be calculated on the basis of total %age of rates above or below quoted by contractor on BOQ. The rates basis for extra item shall be based on DSR 2018 Items/Market Rate as per bill provided (The market rates of extra items shall be decided by works committee by market quotation process).

11. Securities:

The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank or surety acceptable to the Employer. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a Bank Guarantee.

12. Termination:

12.1 The Employer may terminate the Contract if the other party causes a fundamental breach of the Contract.

12.2 Fundamental breaches of Contract include, but shall not be limited to the following:

a. the contractor stops work for 28 days and the stoppage has not been authorized by the Engineer-in-charge
b. the Contractor has become bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

c. the Engineer-in-charge gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer-in-charge;
d. the Contractor does not maintain a security which is required;

12.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.

12.4 If the Contract is terminated the Contractor shall stop work immediately, make the Site safe and secure and leave the Site as soon as reasonably possible.

13. **Payment upon Termination**

13.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer-in-charge shall issue a certificate for the value of the work done less advance payments received up to the date of the issue of the certificate, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law.

13.2 If the Contract is terminated at the Employer's convenience, the Engineer in charge / Institute works committee shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law.

14. **Dispute settlement**

If over the works, any dispute arises between the two parties, relating to any aspects of this Agreement, the parties shall first attempt to settle the dispute through mutual and amicable consultation.

In the event of agreement not being reached, the matter will be referred for arbitration by a Sole Arbitrator not below the level of retired Superintending Engineer, PWD to be appointed by the first party. The Arbitration will be conducted in accordance with the Arbitration and Conciliation Act, 1996. The decision of the Arbitrator shall be final and binding on both the parties.

CIVIL WORKS LOCATION AND SCOPE OF WORK:

1. LOCATION OF WORK: At various Hostels at ICAR-NDRI, Karnal

2. SCOPE OF WORK:

(i) Providing parking shed at Sutluj hostel with profile sheet roofing and paver block flooring.

(ii) Providing and fixing Aluminium frame, wire mesh in balconies of sutluj hostel.

(iii) Providing and fixing paver blocks in open area at sutluj hostel and kaveri hostel, etc

(iv) Providing and fixing rainwater harvesting well in Kaveri Hostel

(v) Providing and fixing sitting shed with puff sheet roofing at Kaveri Hostel

(vi) Repair and renovation of various damaged cantilever and other repair and maintenance at hostels

(vii) Construction of damaged brick wall

(iv) Providing and fixing of cement concrete flooring work at various locations

(vi) Providing and fixing of R.C.C work, brick works as per approved drawing.

(viii) Providing and finishing plastering, putty, painting, flush pointing, etc works as per site requirements

NAME, ADDRESS AND SIGNATURE OF THE TENDERER

ACCEPTING AUTHORITY

Technical specification (Civil)

SPECIAL CONDITIONS

1.0 General

1.1 Except for the items, for which Particular Specifications are given or where it is specifically mentioned otherwise in the description of the items in the schedule of quantities, the work shall generally be carried out in accordance with the "CPWD Specifications 2019 Vol. I & II" and as per instructions of Engineer-in-charge. Wherever CPWD Specifications are silent, the latest IS Codes / Specifications shall be followed and the rates should be all inclusive.

In the case of discrepancy between, the Specifications and/ or the Drawings, the following order of preference shall be observed:-

(i) Nomenclature of item as per Schedule of Quantities(B.O.Q)
(ii) Special Conditions.
(iii) Particular Specifications.
(iv) CPWD Specifications.
(v) Indian Standard Specifications of B.I.S.
(vi) All non-schedule items shall be governed by manufacturer's Standard specifications.

The works to be under taken by the contractor shall inter-alia include the following:

Contractor shall provide all the co-ordinated services before starting any work. The contractor shall submit material submittals along with material sample for site engineer approval prior to delivery of material at site.

1.2 Any reference made to any Indian Standard Specifications, shall imply to the latest version of that standard, including such revisions / amendments as issued by the Bureau of Indian Standards upto last date of receipt of tenders. **The Contractor shall keep at his own cost all such publications including relevant Indian Standard applicable to the work at site.**

1.3 The work should be planned in a systematic manner so that chase cuttings in the walls, ceilings and floors is minimized. Wherever absolutely essential, the chase shall be cut using chase cutting machines. Chases will not be allowed to be cut using hammer / chisel. The electrical boxes should be fixed in walls simultaneously while raising the brick work. The contractor shall ensure proper co-ordination of various disciplines viz. sanitary & water supply, horticulture & electrical etc.

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

1.5 Samples including brand / quality of materials and fittings to be used in the work shall be got approved from the Engineer-in-charge well in advance of actual execution and shall be preserved till the completion of the work.

1.6 Equipment like concrete pump excavators/Transit mixer etc. shall be allowed to be moved away from the site when, in written opinion Engineer-in-charge, the same are no longer required at site of work.

1.7 The contractor, his agents / representative, workman etc. shall strictly observe orders pertaining to fire precautions prevailing in the area.

1.8 Contractor(s) shall study the soil investigation report for the site and satisfy himself about complete characteristics of soil and other parameters at site. However, no claim on the alleged inadequacy or incorrectness of the soil data supplied by the department shall be entertained.

1.9 The tenderer shall see the approaches to the site. In case any approach from main road is required at site or existing approach is to be improved and maintained for cartage of materials by the contractor, the same shall be provided, improved and maintained by the contractor at his own cost.

1.10 Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at his own cost.

1.11 The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing barriers. He shall be responsible for all damages and accidents caused to work due to negligence on his part. No hindrances shall be caused to traffic, during the execution of the work.

1.12 The contractor shall take instructions from the Engineer-in-charge & Incharge (Civil) regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, compound wall, services etc are to be constructed.

1.13 The contractor shall provide at his own cost suitable weighing, surveying and leveling and measuring arrangements as may be necessary at site for checking. All such equipments shall be got calibrated in advance from laboratory, approved by the Engineer-in-charge. Nothing extra shall be payable on this account.

1.14 Contractor shall provide permanent bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural and plumbing drawings.

1.15 Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform Specifications are not applicable. The contractor should get the materials (fixtures/fittings) tested by the wherever required at his own cost.

1.16 The work shall be carried out in accordance with the approved drawings and Structural drawings. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work, nomenclature of items, specifications etc. and satisfy himself that the information available there from is complete and unambiguous. The figures & the written dimensions of the drawing shall supercede the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Engineer-in-charge for immediate decision 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 on this account.

1.17 The Architectural drawings other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fittings involved unless and otherwise specifically mentioned.

1.18 The contractor should submit the shop drawing of staging and shuttering for approval of Engineer-in-charge before actually commencing the execution of work under the item. Nothing extra shall be payable on this account.

1.19 Other agencies may also simultaneously execute and install the works and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings, trenches etc. as may be required for such related works (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be available as specified elsewhere in the contract) and the contractor shall fix the same at the time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

1.20 The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

1.21 All material shall only be brought at site as per program finalized with the Engineer-in-charge Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.

1.22 The contractor shall procure the required materials in advance so that there is sufficient time for testing of the materials and approval of the same before use in the work.

1.23 Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. 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. In case temporary supporting/shifting of such services is required to facilitate

the work, the same shall be done by the contractor at no extra cost ..In case the existing services are to be shifted permanently, then before dismantling the existing services, alternate/diversion of service lines has to be laid by the contractor so that there is no interruption in use of existing services. The contractor has to plan the alternate suitable route for diversion/shifting of service lines and get the same approved from the Engineer-in-charge before starting shifting of services. Nothing extra shall be paid except the payment of dismantling and laying of new service lines as per conditions of contract.

1.24 The contractor shall be responsible for the watch and ward / guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.

1.25 The contractor shall be fully responsible for the safe custody of materials brought by him/ issued to him even though the materials may be under double lock key system.

1.26 For construction works which are likely to generate malba / rubbish to the tune of more than a tempo / truck load, contractor shall dispose of malba, rubbish & other unserviceable materials and wastes at his own cost to the notified specified dumping ground and under no circumstances these shall be stacked / dumped even temporarily, outside the construction premises.

2.0 BATCH MIX CONCRETE/ CAST IN SITU

The contractor shall establish a field laboratory at site of batch mix plant to test the coarse aggregate, fine aggregate, water, sand, cement etc. Contractor is also required to depute technical personnel specifically for running of Batch Mix Plant/ and for quality control of mix produced.

Unless otherwise specified in the schedule of quantities or CPWD specifications, the rates for respective items shall be all inclusive and apply to the following: -

(i) All lifts & all heights, floors including terrace, leads and depths.
(ii) All labour, material, tools and plants and other inputs involved in the execution of the item.
(iii) Any of the conditions and specifications mentioned in the tender documents.
(iv) Pumping / bailing out surface water / rain water / sub soil water, if necessary for any reason.
(v) Providing sunk flooring in bath-rooms, kitchen, etc.
(vi) Any legal or financial implications resulting out of disposal of earth, if any.
(vii) Payment of Royalty at the prevailing rates, if any, on the boulders, metal, shingle, sand and bajri etc. any other material collected by him for the work direct to revenue authorities.
(viii) Performance test of the entire installation(s) before the work is finally accepted.

(ix) Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been built in the items.

(x) All incidental charges for cartage, storage and safe custody of materials brought to site.

3.0. TESTING OF MATERIAL: -

3.1 All cement , sand , aggregate , concrete , steel TMT, HYSD bars etc testing are to be carried out by authorised govt approved lab and certification to be arranged at contractors own cost and arrangements . as per C.P.W.D quantity norms for sample test.

a) 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 Technical Assistant (Civil Wing). & 50% of tests shall be witnessed by Incharge (Civil Wing). At least 10% of the tests are to be witnessed by the Engineer-in-charge.

b) All the entries in the registers will be made by the designated Engineering staff of the contractor and same should be regularly reviewed by T.A./T.O./M.E.

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

d) Submission of copy of all test registers, materials at site Register and hindrance register along with each alternate Running Account Bill and Final Bill shall be mandatory. These registers should be duly checked by Engineer-in-charge.

e) Extensive testing of the materials used for construction is a pre-requisite for attaining high quality of the work. This shall also require specialized tests, physical, chemical, ultrasonic, x-ray and various other types of tests which cannot possibly be carried out in a site laboratory. These tests also require specialized personal who regularly deal in such testing. Therefore the need arises for carrying out the tests in outside laboratories. These laboratories may be in the Govt. sector, Semi Govt However, testing of material in any Govt., Lab / Public Undertaking Lab / IIT or NIT Lab / Govt. Engineering College may be allowed by Engineer-in-charge.

3.2 However, if any ultrasonic pulse velocity / load testing or special testing is to be done for concrete whose strength is doubtful, the cost of the same shall be borne by the contractor at his own cost and arrangements.

3.3 In case there is any discrepancy in frequency of testing as given in list of mandatory tests and that in individual subheads of work as per CPWD Specifications higher of the two frequencies of testing shall be followed and nothing extra shall be payable on this account.

3.4 FIELD LABORATORY

The contractor has to establish field laboratory at site including all necessary equipments and skilled manpower for the **field Tests at** his own cost to have proper quality control.

For performing the above tests, the **Field Testing Equipments and Instruments** are to be arranged and maintained by the contractor.

3.5. The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material / work beyond set-out tolerance limit shall be summarily rejected by the Engineer-in-charge & contractor shall be bound to replace / remove such sub-standard / defective work immediately.

3.6 The list of Laboratory/ Field equipment referred above are to be arranged and maintained by the contractor at the site of work. In case the equipment required for any test is not available at site, the department shall get the test conducted from the third party. the cost of taking of sample, packing, transportation, testing charges etc. shall be borne by the contractor irrespective of the results.

4.0 SECRECY

4.1 The contractor shall take all steps necessary that all persons employed on any work in connection with the contract have notice that the Indian Official Secrets Act 1923 applies to them & will continue so to apply even after the execution of such works under the contract.

4.2 The contract is confidential and must be strictly confirmed to the contractor's own use (except so far as confidential disclosure to sub-contractors or suppliers as necessary) and to the purpose of the contract.

4.3 All documents, copies thereof & extracts there from furnished to the contractor shall be returned to the Engineer-in-charge on the completion of the work / works or the earlier determination of the contract.

5.0 LABOUR AND SECURITY

5.1 Contractor should provide his plan for labour huts as per his requirement and get it approved from the Engineer-in-charge. The contractor will be provided space for labour huts etc. inside the campus but the space requirement and location, as assessed by Engineer-in-charge shall be final and binding.

5.2 Contractor has to follow the security requirement of the campus and obtain necessary entry passes for the labour and vehicles and follow security checks at entry / exit gates, restriction on movement of vehicle, restricted timings of working etc. The Department however shall assist the contractor in obtaining such passes for movement of vehicles and labour. No claim whatsoever shall be entertained on account of delay in entry of vehicles and labour including restrictions in working hours, if there is any.

5.3 The contractor shall employ only Indian Nationals after verifying their antecedents and loyalty. The contractor shall, on demand submit list of his agents, employees and work people concerned & shall satisfy as to the bonafides of such people.

5.4 The contractor & his work people shall observe all relevant rules regarding security promulgated in which work is to be carried out by the Administration

5.5 The contractor, his representative, workman shall be allowed to enter through specified gates & timing as laid down by the controlling authority. They shall be issued an identity card or an individual pass in accordance with the standing rules & regulations & they should possess the same while working. The contractor shall be responsible for the conduct & actions of his workman, agents / representatives.

5.6 Normally contractor shall be allowed to carryout work between 7 AM to 6 PM. However, he may also be allowed to carryout the work beyond 6 PM & upto 7 AM if the site conditions / circumstances so demand with prior written permission from the Engineer-in-charge. However, if the work is carried out in more than one shift or at night, no claim on this account shall be entertained.

5.7 Normally contractor's material / vehicles etc shall be allowed to move in / go-out between 7 AM to 7 PM only & no movement of material / vehicles out of site of work shall be allowed during night hours unless specific permission is obtained from the Engineer-in-charge.

5.8 In case if a separate entry has been allowed, the contractor has to make all arrangement for making a separate entry gate and barricading of the working area to segregate/separate the same from other areas. All these have to be done by the contractor at his own cost including safeguarding any untoward incident in the restricted area due to separate entry gate and barricading arranged by the contractor. No extra amount on this account shall be payable by the
department.

6.0 TRANSPORTATION AND OFFICE INFRASTRUCTURE:

6.1 In order to complete the work within the scheduled time if the contractor shall be required to do the work in more than one shift and accepted by the department .

7.0 PROGRAM CHART: -

7.1 The Contractor shall prepare an integrated program chart in MS Project/or any Construction Project Software, 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 or earlier and submit the same for approval of the Engineer-in-charge within **15 days** of the issue of letter of acceptance for the contract.

7.2 The work has to be completed in stages for complete work with in time bound .

7.3 If at any time, it appears to the Engineer-in-charge 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.

7.4 The submission of revised program or approval by the Engineer-in-charge of such program or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-charge to take action against the contractor as per terms and conditions of the agreement. Not withstanding the fact that the contractor will have to pay to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and/or extra amounts for any other reason.

8.0 PROGRESS AND MONITORING OF WORK:

Contractor shall give the Engineer-in-charge on the 10th day of each month, progress report of the work done during the previous month. Such progress report will include the project progress summary, work progress (planned v/s. actual), PERT chart, milestone status, financial progress status, manpower deployment status, important materials consumed, materials at site at the beginning of the month, materials consumed during the month and the balance quantities at the end of month and progress of the work stating the reasons for shortfall, if any including the steps and measures to be taken for making good the shortfall in the succeeding period. Non submission of aforesaid progress report shall make contractor liable for action under breach of contract conditions.

9.0 SAMPLE OF MATERIALS:-

9.1 All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-charge which shall be preserved till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-in-charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per **List of Preferred Makes** for approval of Engineer-in-charge.
For all other items, ISI Marked materials and fittings shall be used with the approval of Engineer-in-charge. Wherever ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant Specifications or IS codes for the approval of Engineer-in-charge.

9.2 To avoid delay, contractor should submit samples as stated above well in advance so as to give timely orders for procurement. If any material, even though approved by Engineer-in-charge is found defective or not conforming to specifications shall be replaced / removed by the contractor at his own risk & cost.

9.3. BIS marked materials except otherwise specified shall also be subjected to quality test besides testing of other materials as per the specifications described for the item/material. Wherever BIS marked materials are brought to the site of work, the contractor shall, furnish manufacturer's test certificate or test certificate from approved testing laboratory to establish that the material procured by the contractor for incorporation in the work satisfies the provisions of specifications relevant to the material and / or the work done. BIS marked items (except cement & steel for which separate provisions have been made in para 10.0) required on the work shall be got tested, for only important tests, which govern the quality of the product, as decided by the Engineer-in-charge. The frequency of such tests (except the mandatory test) shall be 5% of the frequency as specified in BIS. For mandatory test, frequency shall be as specified in the CPWD Specifications

9.4 For certain items, if frequency of tests is neither mentioned in the CPWD Specifications & BIS, then tests shall be carried out as per decision of Engineer-in-charge.at contractor own cost and arrangements

10.0 CEMENT & STEEL REINFORCEMENT

10.1 Contractor has to produce manufacturers test certificate for each lot of Cement & Steel Reinforcement procured at site.

10.2 **CEMENT:-**

10.2.1 The contractor shall procure 43 Grade Ordinary Portland Cement and/or Portland Pozzolona Cement (Fly Ash based), required in the work from reputed manufacturers of cement as per the approved make in 50 kg. bags bearing manufacturer's name and ISI marking, along with manufacturers test certificate for each lot. Portland Pozzolona Cement is to be used for RCC works. In case contractor / firm uses OPC only nothing extra shall be paid.

10.2.2 Samples of cement arranged by the contractor shall be submitted to Engineer-in-charge for quality check .The sample must be tested by contractor in govt. approved laboratory in accordance with provisions of relevant BIS Codes & submit report to Engineer-in-charge at contractor own cost and arragments. The cement for such testing purpose shall be supplied by the contractor free of charge. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS Codes, the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-charge to do so. The cost of tests shall be borne by the contractor.

10.2.3 OPC/ PPC shall be brought at site in bulk supply of approximately as per site requirements.

10.2.4 OPC/ PPC bags shall be stored in separate godowns. Separate godowns for tested cement and fresh cement (under testing) to be constructed by the contractor at his own cost as per

sketches given in C.P.W.D Specifications having weather-proof roofs and walls. The size of the cement godown is indicated in the sketches for guidance. The actual size of godown shall be as per site requirements and nothing extra shall be paid for the same. Each godown shall be provided with a single door with two locks. The keys of one lock shall remain with Engineer-in-charge of the work and that of other lock with the authorized agent of the contractor at the site of work so that the cement is issued from godown according to the daily requirement with the knowledge of both parties. The account of daily receipt and issue of cement shall be maintained in a register in the prescribed proforma and signed daily by the contractor or his authorized agent and Engineer-in-charge or his authorized representative in token of its correctness. The day to day receipt and issue accounts of different grade/brand of cement shall be maintained separately in the standard proforma by the contractor or his authorized representative which shall be duly signed by the authorized representative of the Engineer-in-charge before issue to the work on day to day basis.

The capacity of each cement go-down shall be as per site requirements and shall be constructed by the contractor at site of work and at the site of batching plant for which no extra payment shall be made. The contractor shall be responsible for the watch and ward and safety of the cement godowns. The contractor shall facilitate the inspection of the cement go-downs by the Engineer-in-charge at any time

10.2.5 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in of the contract and shall be governed by the conditions laid therein.

10.2.6 Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-charge.

10.2.7 In case the contractor brings surplus quantity of cement the same shall be removed from the site after completion of work by the contractor at his own cost after approval of the Engineer-in-charge.

Cement, which is not used within 90 days from its date of manufacture, shall be retested at approved laboratory. Until the results of such tests are found satisfactory, it shall not be used on the work.

10.3 **STEEL REINFORCEMENT: -**

10.3.1 The contractor shall procure Thermo Mechanical Treated (TMT) Steel Reinforcement bars of Fe 500D from Primary steel producers such as SAIL, Tata Steel Ltd, RINL, Jindal Steel & Power Ltd, and JSW Steel Ltd, or any other producer as approved by CPWD who are using iron ore as the basic raw material/ input and having crude steel capacity of 2.0 million tonnes per annum and above.

a) The grade of the steel shall be Fe 500 D as per BIS 1786-2008.

b) The TMT bars procured from primary producers shall conform to manufacture's specifications.

10.3.2 The contractor shall have to obtain and furnish test certificates to Engineer-in-charge in respect of all the supplies brought by him to the site of work.

10.3.3 : In case the test results indicate that the steel arranged by the contractor does not conform to the specifications, as defined under this contract , 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 or written orders from the Engineer-in-charge to do so: -

10.3.4 The steel reinforcement shall be brought in bulk supply as per site requirement along with manufacturer test certificate for each lot.

10.3.5 The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion and nothing extra shall be paid on these accounts. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

10.3.6 Unless OTHERWISE specified elsewhere in the contract document, the testing (nominal mass. tensile strength, bend test, rebend test etc.) shall be done as per frequency of samples not less than as per CPWD norms

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

10.3.8 The Actual issue and consumption of steel on work shall be regulated and proper account maintained as provided in of the contract. The theoretical consumption of steel shall be worked out as per procedure prescribed in the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment need to be made.

10.3.9 Steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

10.3.10 The contractor shall submit original vouchers from the manufacturer for the total quantity of steel supplied under each consignment to be incorporated in the work. All consignment received at the work site shall be inspected by the Site staff along with the relevant documents before acceptance. The contractor shall obtain Original Vouchers and Test Certificates and furnish the same to the Engineer-in-charge in respect of all the lots of steel brought by him from approved supplier to the site of work. The original vouchers and test certificates shall be defaced by the Site staff and kept on record in the site office.

10.3.11 Reinforcement including authorized spacer bars and lappages shall be measured in length of different diameters asactually (not more than as specified in the drawings)

used in the work nearest to a centimeter. Wastage and unauthorized overlaps shall not be measured.

10.3.12 The standard sectional weights as in CPWD Specifications will be considered for conversion of length of various sizes of M.S. Bars, T or Steel Bars and T.M.T. bars into Standard Weight.

10.3.13 Records of actual Sectional weights shall also be kept dia-wise and lot-wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as Derived Actual Weight.
However for the stipulated issue of steel reinforcement up to and including 10mm diameter bars, the actual weight of steel issued shall be modified to take into account the variation between the actual and the standard coefficients and the contractors' accounts will be debited by the cost of modified quantity.

10.3.14 a) If the Derived Weight as in sub-para (10.3.13) above is less than the Standard Weight as in Sub-para (10.3.12) above then the Derived Actual Weight shall be taken for payment provided, it is within the tolerances specified in IS 1786-2008, otherwise whole lot will be rejected.

(b)If the Derived Actual Weight is found more than the Standard Weight, the Standard Weight as per in subpara (10.3.12) above shall be taken for payment. In such case nothing extra shall be paid for the difference between the Derived Actual Weight and the Standard Weight.

11.0 **ENGAGING SPECIALISED AGENCIES FOR WORKS: -**

11.1 The Specialized agency for the work shall be got approved from the Engineer-in-charge well before actual commencement of the item of work. The contractor shall submit the list of Specialized agencies except for Internal Electrical Installation, proposed to be engaged by him along with necessary performance certificates, within 30 days from the date of issue of acceptance letter to substantiate technical capability and experience of the agency for prior approval of the Engineer-in-charge.

11.2

11.2.1. Provisions mentioned .above are not applicable for engagement of Electrical Agency. However contractor shall submit MOU to Engineer-in-charge, signed with eligible Electrical Contractor/Agency along with consent letter of Electrical Agency **at least 7 days before the last date of submission of Performance Guarantee.** It will be obligatory on the part of main contractor to sign the tender documents for all the components.

11.2.2 If the main contractor fails to associate agency/agencies for execution of minor components of work within prescribed time or furnishes incomplete details or furnishes details of ineligible agencies even after the tenderer is given due opportunity, the entire scope of such component of works shall be withdrawn from the tender and the same shall be got executed by the Engineer-in-charge committee at the risk and cost of the main contractor.

11.2.3 Same milestones shall be applicable for all components of work.

11.2.4 For the specialized item of Polypropylene Pipes the contractor shall engage such vendors as approved by the manufacturer.

12.0 Defect liability:

12.1 The contractor's liability during the defect liability period/guarantee period from the final date of completion as per shall be limited to rectification of defects including replacement as follows which in the opinion of Engineer-in-charge are not man made.

Sl. No.	Description	Defect Liability
(i)	Concrete	(a) Rectification of structural / superficial / non-structural cracks. (b) Rectification of dampness / seepage in roof slab / junctions & sunken portion. (c) Rectification of cracks in beam, shade, column.
(ii)	Brick work	(a) Rectification of cracks in panel wall / portion. (b) Cracks / settlement of dwarf walls. (c) Rectification of efflorescence.
(iii)	Joinery	(a) Replacement of warped joinery. (b) Cracks in panels, rails / styles etc.
(iv)	Builders Hardware	(a) Repairs / Replacement of loosened / pre-mature failure of fittings. (b) Tightening / Replacement of sag in mosquito proofing.
(v)	Steel & Iron work	(a) Rectification / Replacement of defective part of rolling shutter. (b) Redoing of defective portion in fabrication / welding including painting. (c) Steel windows, grills, gates etc. – defects to be rectified.
(vi)	Roof treatment	(a) Rectification of leakage / seepage of roof slab including covering at junction till guarantee period.
(vii)	Plastering	(a) Rectification of structural / superficial cracks if any. (b) Rectification of protruding / peeling off plaster if any. (c) Rectification of efflorescence
(viii)	Flooring	(a) Rectification of sinking portion of plinth protection including saucer drain.

		(b) Settlement of foundation & floors.
(ix)	Plumbing / Sanitary fittings	(a) Making good of leakage through soil / waste pipe joints. (b) Replacement of looking mirror if found wavy. (c) Rectification of leakage of over head tanks. (d) Leakage / seepage of sunken floor, blockage of taps / pipes, nonfunctioning of cistern.
(x)	Finishes	(a) Making good of defective / dissimilar patches of painting to match with remaining surfaces.
(xi)	Internal Water Supply	(a) Repairs / Replacement of defective taps / fittings. (b) Repair to leakage of GI water pipe lines including joints. (c) Removal of blockage of GI pipe lines.
(xii)	Roads	(a) Repair of sinking portion of road & potholes, if any
(xiii)	Sewage	(a) Rectification of slope / system if found defective during use. (b) Rectification of major blockage in Sewer lines. (c) Cracks & settlement of sewage lines.
(xiv)	Drains	(a) Repair to Drains. (b) Settlement of Drains
(xv)	External Water Supply	(a) Repairs to installations & fittings.
(xvi)	General	(a) All manufacturing defects of structures / fixtures / fittings / equipments other than listed above.

PARTICULAR SPECIFICATIONS

1.0 EARTH WORK:-

1.1 Earthwork should be well rammed and filling of soil should be done in layered manner as per CPWD specifications 2019.

2.0 R.C.C. WORK:-

2.1 **Design Mix Concrete.**

2.1.1 The RCC work shall be done with Design Mix Concrete. Wherever letter M has been indicated, the same shall imply for the Design Mix Concrete. The Design Mix Concrete will be designated based on the principles given in IS: 456, 10262 & SP 23. The Conditions & Specifications stated herein shall have precedence over all conditions & specifications stated in relevant I.S. Codes/ C.P.W.D. Specifications. The concrete mix shall be designed for the specified target mean compressive strength in order to ensure that work test result do not fall below the acceptance criteria specified for the concrete mix. The Contractor shall design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting the requirements specified.

(a) The contractor has to submit design mix without use of admixtures.

(b) Admixture may be added in case of specific technical requirement so as to meet the workability / slump requirement or for any other reason but nothing extra is to be paid to contractor on account of adding admixtures.

2.1.2 The sources of coarse aggregate, fine aggregate, water, admixture & cement to be used in concrete work shall be identified by the contractor & he will satisfy himself regarding their conforming to the relevant specifications & their availability before getting the same approved from the Engineer-in-charge

(a) **Coarse Aggregate:-** As per CPWD Specifications

(b) **Fine Aggregate:-** As per CPWD Specifications

(c) **Water:-** It shall conform to requirements laid down in IS:456-2000 /Para 3.1.1 of CPWD Specifications. If on testing, water from the source is not found fit for construction, the necessary arrangement for treatment of water shall have to be made by the contractor at the site and nothing extra shall be payable for the same.

(d) **Cement:-** OPC of grade 43 shall conform to IS: 8112 or IS: 12330 and / or Portland Pozzolona Cement (Fly ash based), required in the work fromreputed manufacturers of cement as per the approved make in 50 kg.bags bearing manufacturer's name and ISI marking, along withmanufacturers test certificate for each lot. If Portland PozzolonaCement is used for RCC work, the

same shall be subject to fulfillmentof conditions of circular No. CDO/SE(RR)/Fly ash (MAN) 02 dated09.04.09 and shall conform to IS: 1489-Part-I. However, if thecontractor uses higher grade of cement nothing extra shall be paid.

(e) **Admixture/ Plasticizer:-** The admixture shall conform to IS: 9103. Whenever required, theadmixture of approved quality & approved make only shall be used toattain the required workability. Nothing extra on account of use ofAdmixture / Plasticizer shall be payable.

2.1.3 Water Cement Ratio and Slump:-

2.1.3.1 In proportioning a particular mix, the manufacturer/ producer/ contractor shall give due consideration to the moisture content in the aggregates, and the mix shall be so designed as to restrict the maximum free water cement ratio to less than 0.5.

2.1.3.2 Due consideration shall be given to the workability of the concrete thus produced. Slump shall be controlled on the basis of placement in different situations. For normal methods of placing concrete, maximum slump shall be restricted to 100mm when measured in accordance with IS: 1199.

2.1.4 Characteristic Compressive Strength compliance Requirement

Specified Grade	Mean of the Group of 4 Non-Overlapping Consecutive Test Results in N/mm2	Individual Test Results in N/mm2
(1)	(2)	(3)
M20 or above	> fck + 0.825 x established standard deviation (rounded off to nearest 0.5 N/mm2) Or fck+ 4 N/mm2, whichever is greater Where fCK is characteristic compressive strength of CC Cube at 28 days	fck- 4 N/mm2
Note(i): In the absence of established value of standard deviation, the values given in Table may be assumed, and attempt should be made to obtain results of 30 samples as early as possible to establish the value of standard deviation. **(ii) :** The acceptance criteria for compressive strength as mentioned in IS 456:2000 as amended upto date shall prevail over the above criteria in case of any difference.		

2.1.5 The Contractor shall engage one of the following approved laboratories / test house for designing the concrete mix in accordance with relevant IS Code and to conduct

laboratory tests to ensure the target strength & workability criteria for a given grade of concrete: -

i) National Institute of Technical Teacher Training & Research (NITTTR), Sector 26, Chandigarh.
ii) Punjab Engineering College, Chandigarh.
iii) NIT, Jalandhar. (Formerly known as REC, Jalandhar.)
iv) IIT, New Delhi.
v) Chandigarh Engineering College, Sector 26, Chandigarh.
vi) NIT, Kurukshetra.

The various ingredients for mix design / laboratory tests shall be sent to the lab / test houses through the Engineer-in-charge and the samples of such aggregates sent shall be preserved at site by the department.

In the event if all the **above** laboratories are unable to carry out the requisite design / testing, the contractor may,have it done from any other laboratory with prior approval of the Engineer-in-charge..

2.1.6 The contractor shall submit the report on design mix from any of above approved laboratories for approval of Engineer-in-charge within 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the design mix is approved. In case of White Portland Cement and the likely use of admixtures in concrete with ordinary Portland/White Portland Cement, the contractor shall design and test the concrete mix by using trial mixes with white cement and / or admixtures also, for which nothing extra shall be payable.

2.1.7 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, the contractor as per the directions of the Engineer-in-charge shall submit a revised laboratory mix design report conducted at laboratory established at site.

2.1.8 All cost of mix designing and testing, connected therewith, including charges payable to the laboratory shall be borne by the Contractor including redesigning of the concrete mix whenever required & as directed by Engineer-in-charge.

2.1.9 The mix design for a specified grade of concrete shall be done for a target mean compressive strength Tck = Fck + 1.65s

Where Fck = Characteristic compressive strength at 28 days.
S = Standard deviation which depends on degree of quality control.

The standard deviation for different grades of concrete shall be as follows: -

GRADE OF CONCRETE	STANDARD DEVIATION
M-20	4.0
M-25	4.0
M-30	5.0
M-35	5.0
M-40	5.0

However, actual standard deviation based on test strength of samples for each grade of concrete shall be calculated separately as per procedure laid down in clause 9.2.4 of code of practice IS:456:2000.

2.1.10 TRIAL BATCHES

(a) The designed mix proportions shall be checked for target mean compressive strength by means of trial batches.

(b) Minimum three sets of separate preliminary tests shall be carried out for each trial batch of concrete mix.
Each test shall comprise of six specimens and only one test-set of six specimens shall be made on any particular day.

(c) The quantities of materials for each trial mix shall be sufficient for at least six specimens (cubes) and the concrete required for carrying out workability tests.

(d) The workability of trial mix No.1 shall be measured and mix shall be carefully observed for freedom from segregation, bleeding and its finishing characteristics. The water content, if required, shall be adjusted corresponding to the required changes in the workability.

(e) With the modified Water Content, the mix proportions shall be recalculated by keeping with water cement ratio unchanged. The mix proportion, as modified, shall form the Trial Mix No.2 and tested for the specified strength and workability.

(f) In addition, trial mix No.3 and 4 shall be designed by keeping water contents same as that determined for trial mix 2 but varying the water cement ratio by + 10 percent of the specified value and tested for their design characteristics.

(g) Out of the six specimen of each set, three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only

to indicate the strength to be attained at 28 days, while the design mix shall be approved only on the basis of test strength at 28 days.

2.1.11 APPROVAL OF DESIGN MIX

The design mix shall be considered satisfactory and approved if at least three preliminary test-sets individually satisfy the following strength and workability criteria:

(a) The average strength of each test-set is not less than the specified target mea compressive strength (Tck).

(b) The strength of any specimen cube is not less than 0.85 Tck.

(c) The concrete mix is of required degree of workability and acceptable concrete finish.

2.2 BATCHING & MIXING:-

(a) All design mix concrete shall be done using fully automatic batching plant conforming to IS: 4925 of minimum 15 cum per hour capacity. The automatic batching plant shall be charged by devices when actuated by a single starter switch, will automatically start the weighing operation of each material (i.e. stone aggregate, sand, cement, water, admixture etc.) and stop automatically when designated weight of each material has been reached and also it should have rated capacity (in terms of concrete in a single batch). It shall have control panel for operation of the batching plant complete with printing facility.

(b) The contractor shall be free to use Ready Mix Concrete (RMC) in place of Batch mix concrete at his own cost. The contractor shall ensure that transit mixtures shall transport the concrete to site. All the precautions shall be taken during the transportation and handling of concrete to achieve the desired strength, durability, etc. as envisaged in the Mix Design. Contractor has to get the approval from Engineer-in-charge regarding source of RMC by giving the details of such plants indicating name of owner / company, its location, technical establishment, past experience and text of Memorandum of Understanding (proposed to be entered between purchaser and supplier). The Engineer-in-charge, after satisfying himself about quality / capability of the company shall give approval in writing (subject to drawing of MOU). The MOU shall be drawn with RMC plant owner / company and submitted to Engineer-in-charge within a week of such approval. The contractor will not be allowed to purchase RMC without completion of above formalities for use in the project. Notwithstanding the approval granted by Engineer-in-charge in aforesaid manner, the contractor shall be fully responsible for quality of concrete including input control, production, transportation and placement etc. The Engineer-in-charge will reserve the right to deploy his supervisor at plant site to inspect at any such stage and reject the material / concrete etc if he is not satisfied about quality of material / product. General information to be supplied by the contractor to supplier of RMC shall be as per Table given.

(c) RMC shall conform to CPWD specifications -2019. However contractor may use design mix concrete for smaller RCC works like lintels, filling starters of columns, coping etc. with the help of batch mix plant of approved capacity at site.

(d) All measuring equipment shall be maintained in a clean and serviceable condition and their accuracy shall be checked at least once a month.

(e) Only single sized good quality stone aggregate shall be brought to site of work from the approved source.

(f) It is important to maintain the Water Cement Ratio constant at its specified or approved value by making adjustment for the moisture contents of both fine and coarse aggregates.

The moisture contents in the aggregate shall be determined as frequently as possible in keeping with the weather conditions and as per the provisions of IS: 2386 (Part-III).

2.3 OTHER OPERATIONS: -

All other operations in concreting work like mixing, slump, laying, placing of concrete, compaction, curing etc. not mentioned in this particular specifications for Design Mix of Concrete shall be as per CPWD Specifications.

2.4 SAMPLING:-

(a) Samples from fresh concrete shall be taken as per IS 1199 and the test cubes shall be made, cured and tested in accordance with IS: 516.

(b) Each test sample shall comprise of six test cubes (specimen), three of which shall be tested at 7 days and remaining for tests at 28 days.

(c) FREQUENCY OF SAMPLING: -

(i) A random sampling procedure shall be adopted to ensure that the sampling is spread over the entire period of concreting and cover all mixing units. The concrete work shall be notionally divided into lots as under for the purpose of sampling conditions.
-- Footings, rafts etc.
-- Columns and walls at all levels.
-- Beams at all levels.
-- Slabs at all levels.

(ii) At least one test sample shall be taken for each lot of concrete work.
(iii) Each grade of concrete shall form different lot for testing.

(iv) The minimum frequency of sampling of concrete of each grade shall be in accordance with CPWD specification 2019, Vol I with upto date correction slips:-

(v) The concrete work shall be assessed on day to day basis & samples shall be taken as specified.

(vi) Work strength test shall be conducted in accordance with IS: 516 on random sampling.

2.4.1 TEST RESULTS OF SAMPLES: -

The test results of the sample shall be the average of the strength of three specimens. The individual variation shall not be more than + 15% percent of the average. If variation is more, the test results shall be treated as invalid.

2.4.2 STANDARD OF ACCEPTANCE: -

Compressive strength :

i) The concrete shall deemed to comply with the strength requirement when both the following conditions are met.

(a) The mean strength determined from any group of four consecutive test results complies with the appropriate limits

(b) Any individual test result complies with the appropriate limits

ii) **Quality of concrete represented by strength test result**

The quantity of concrete represented by a group of four consecutive test results shall include the batches for which the first and last samples were taken together with all intervening batches.

Where the mean rate of sampling is not specified the maximum quantity of concrete that four consecutive test results represents shall be limited to $60m^3$.

iii) Concrete of each grade shall be assessed separately.

iv) Concrete is liable to be rejected, if it is porous or honeycombed or its placing has been interrupted without providing a proper construction joint or the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction of Engineer-in-charge and Works Committee.

2.5 MEASUREMENT –

(i) As per CPWD Specifications.

2.6 TOLERANCES - As per CPWD Specifications.

2.7 RATES: -

(i)The rate includes the cost of materials, labour and T&P, including mixing, placing, transportation involved in all the operations described above except for the cost of centring, shuttering & reinforcement which will be paid for separately.

(ii) In case of rejection of concrete on account of unacceptable compressive strength, governed by para "Standard of Acceptance" as above, the work for which samples have failed shall be redone at the cost of contractor. However, the Engineer-in-charge/ Institute's works committee may order for additional tests (like cutting cores, ultrasonic pulse velocity test, load test on structure or part of structure, etc) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The Contractor shall take remedial measures necessary to retain the structure as approved by the Engineer-in-charge/ Institute's works committee without any extra cost. However, for payment, the basis of rate payable to contractor shall be governed by the 28 days cube test results and reduced rates shall be regulated in accordance with CPWD Specifications.

2.8 FORM WORK

2.8.1 The work shall be done in general as per CPWD Specifications.

2.8.2 Only M.S. centring / shuttering and scaffolding material unless & otherwise specified shall be used for all R.C.C. work to give an even finish of concrete surface. However, marine-ply shuttering in exceptional cases as per site requirement may be used on specific request from contractor to be approved by the Engineer-in-charge.

2.8.3 Nothing extra shall be paid for the centring and shuttering, circular in shape whenever the formwork is having a mean radius exceeding 6m in plan.

2.8.4 In order to keep the floor finish as per architectural drawings and to provide required thickness of the flooring as per specifications, the level of top surface of R.C.C. shall be accordingly adjusted at the time of its centring, shuttering and casting for which nothing extra shall be paid to the Contractor.

As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept 12 to 20mm or as required, lower than general floors shuttering should be adjusted accordingly. Nothing extra is payable on this account.

2.8.5 Steel shuttering as approved by the Engineer-in-charge shall be used by the contractor. Minimum size of shuttering plates shall be 600mm x 900mm except for the case when closing pieces are required to complete the shuttering panels.

Dented, broken, cracked, twisted or rusted shuttering plates shall not be allowed to be used on the work. The shuttering plates shall be cleaned properly with electrically driven sanders to remove any cement slurry or cement mortar or rust. Proper shuttering oil or de-

bonding compound shall be applied on the surface of the shuttering plates in the requisite quantity before assembly of steel reinforcement.

2.9 REINFORCEMENT:-

2.9.1 The reinforcement shall be done as per CPWD Specifications.

2.9.2 The rate of item of reinforcement of RCC work includes all operations including straightening, cutting, bending, welding, binding with annealed steel or welding and placing in position at all the floors with all leads and lift complete as per CPWD Specifications.

2.9.3 The contractor shall provide approved type of support for maintaining the bars in position and ensuring required spacing and correct cover of concrete to reinforcement as called for in the drawings, spacer blocks of required shape and size. Chairs and spacer bars shall be used in order to ensure accurate positioning of reinforcement. **Spacer blocks shall be cast well in advance with approved proprietary pre-packed free flowing mortars** of high early strength and same colour as surrounding concrete. However Cover Guard Bars shall also be used to maintain proper cover of RCC columns in addition to spacer blocks as mentioned above. Pre-cast cement mortar/concrete blocks/blocks of polymer shall not be used as spacer blocks unless specially approved by the Engineer-in-charge, rate of RCC items is inclusive of cost of such cover blocks & Cover Guard Bars.

2.10 PRE CAST R.C.C WORK:-

2.10.1 Pre-cast reinforced concrete units shall be of grade or mix as specified. Provision shall be made in the mould to accommodate fixing devices such as hooks etc. and forming of notches and holes. Each unit shall be cast in one operation. A sample of the unit shall be got approved from Engineer-in- charge before taking up the work.

2.10.2 Pre-cast units shall be clearly marked to indicate the top of member and its location.

2.10.3 Pre-cast units shall be stored, transported and placed in position in such a manner that these are not damaged.

2.10.4 The compaction of the concrete shall be done by vibrating, table or external vibrator, as approved by Engineer-in-charge. The rate quoted for the item shall include the element for framework and mechanical vibration.

2.10.5 Rate for item includes cost of all materials, labour, and all operations involved. Cost of M.S. frames, lugs including their welding, lifting hooks is also included.

2.10.6 The work shall be done in accordance with CPWD Specifications.

3.0 BRICK WORK:-

3.1 The brickwork shall be carried out with good quality well common burnt clay Machine moulded / F.P.S. (Non modular) bricks of class designation 7.5 as per CPWD Specifications. Exposed brick work for ground level to plinth lavel shall be executed with selected bricks of class designation 7.5

3.2 The rate shall also include for leaving chases / notches for dowels / cramps for all kinds of cladding to come over brick work.

3.3 Brick work provided around shaft or lift walls or around slab cutouts shall be measured in the brick for corresponding floor level. Nothing extra shall be paid on this account.

3.4 M.S. bars provided at every third course of half brick masonry shall be in single piece. If required, welding joint can be used without overlaps. Nothing extra shall be paid for welding and overlaps.

3.5 Half brick masonry work shall be carried out with good quality well common burnt clay F.P S. (non modular) bricks of class designation 7.5 as per CPWD Specifications.

4.0 STONE / MARBLE WORK :-

4.1 General: - The execution of stones work shall be in general as per CPWD Specifications.

4.2 SAMPLES FOR STONE WORK:-

Samples of each item of stone work either individually or in combination shall be prepared for approval of Engineer-in-charge before commencement of work.

5.0 STEEL WORK:-

5.1 The work shall be carried out as per CPWD Specifications.

5.2 **Pressed Steel Frame / T Iron Frames**: - The work shall be done as per CPWD Specifications. The frames shall be fabricated in approved workshops as given in this contract The angle and flat iron frames for cupboard shall also be fabricated from the above approved workshops.

5.3 **Steel windows / ventilators**: The work shall be done strictly as per CPWD Specifications. Flash butt-welded steel windows / ventilators only shall be provided and shall be procured from the approved manufacturers. The corners should be welded to form a solid fused welded joint conforming to the requirement given below.

a) Weld shall be made all along the place of meeting the member.
b) Weld should be properly grounded.
c) Complete cross section of the corner shall form a solid joint with no cavities, free from cracks, under cutting, overlaps, gross porosity and entrapped slag.\

The fixing lug shall be as per IS 1038 with adjustable slot & fixed to window frames by screws & nuts.

The fixing of unit shall be done as per IS 1081.

5.4 **M.S. Sheet Door** – M.S Sheet shall be in one piece i.e. no joint in M.S. Sheet shall be permitted.

6.0 **Workmanship/Execution:** Skilled Staff to be provided at site so that proper finishing and execution may be achieved within time boundation.

7.0 **FLOORING:-**

7.1 All work in general shall be carried out as per CPWD Specifications.

7.2 Whenever flooring is to be done in patterns of tiles and stones, the contractor shall get samples of each pattern laid and approved by the Engineer-in-charge before final laying of such flooring. Nothing extra shall be payable on this account.

7.3 Different stones / tiles used in pattern flooring shall be measured separately as defined in the nomenclature of the item and nothing extra for laying pattern flooring shall be paid over and above the quoted rate. No additional wastage, if any, shall be accounted for any extra payment.

7.4 Samples of flooring stones (Kota/ Marble/ Granite etc.) shall be deposited well in advance with the Engineer-in-charge for approval. Approved samples should be kept at site with the Engineer-in-charge and the same shall not be removed except with the written permission of Engineer-in-charge.. No payment whatsoever shall be made for these samples.

7.5 The Marble/ Kota/ Granite or any other stone shall be fully supported by the details establishing the quarry and its location.

7.6 Full width Marble/ Kota/ Granite stone over kitchen platform shall be provided which shall not be less than 900mm long except to adjust for closing pieces. The marble / stone flooring in treads and risers of staircase shall not be less than 1500mm long except to adjust the closing pieces. Nothing extra shall be paid on these accounts

7.7 **PVC& Wooden Flooring**

The PVC & wooden flooring shall be procured from the approved manufacturer and work shall be carried out as per approved drawings and direction of Engineer-in-charge.

7.8 **Ceramic/ Vitrified Tiles Flooring**

The tiles shall be procured from the approved manufacture of the approved shade & colour.

The tile shall be conforming to IS-13755, IS-13753 and IS-15622 for floor and wall tiles respectively.

Tiles for dado shall be 200mm x 300mm (minimum size) GROUP-III as approved.

Tiles for flooring shall be 300mm x 300mm (minimum size) GROUP-V Tiles as approved.

Test shall be conducted to satisfy the quality of material as per CPWD Specifications

7.9 The full body vitrified tiles of specified sizes shall be used & samples of tiles shall be got approved from the Engineer-in-charge . All tiles shall be rectified. The mandatory tests for vitrified tiles shall be got done as per CPWD Specifications (Vol.1)/relevant BIS Code.

7.10 Glass Mosaic Tile Flooring shall be with approved random colour mix design tiles and work shall be carried out as per direction of Engineer-in-charge.

7.11 The rate of items of flooring is inclusive of providing sunken flooring in bathrooms, kitchen etc. and nothing extra on this account is admissible. The proper gradient shall be given to flooring for toilets, verandah, kitchen, courtyard, etc. as per the directions of Engineer-in-charge

8.0 WATER PROOFING FOR SUNKEN FLOORS:-

8.1 The work shall be got executed from the specialized agency as approved by the Engineer -in Charge.

8.2 Total quantity of the water proofing compound required shall be arranged only after obtaining the prior approval of the make by Engineer-in-charge in writing. Materials shall be kept under double lock and key and proper account of the water proofing compound used in the work shall be maintained. It shall be ensured that the consumption of the compound is as per specified requirements.

8.3 The finished surface after water proofing treatment shall have adequate smooth slope as per the direction of the Engineer-in-charge.

8.4 Before commencement of treatment on any surface, it shall be ensured that the outlet drain pipes / spouts have been fixed and the spout openings have been chased and rounded off properly for easy flow of water.

9.0 WATER PROOFING TREATMENT WORK :-

9.1 The work shall be got executed from the specialized agency as approved by the Engineer-in-charge.

9.2 Total quantity of the water proofing compound required shall be arranged only after obtaining the prior approval of the make by Engineer-in-charge in writing. Materials shall be kept under double lock and key and proper account of the water proofing compound used in the work shall be maintained. It shall be ensured that the consumption of the compound is as per specified requirements.

9.3 The finished surface after water proofing treatment shall have adequate smooth slope as per the direction of the Engineer-in-Charge.

9.4 Before commencement of treatment on any surface, it shall be ensured that the outlet drain pipes / spouts have been fixed and the spout openings have been chased and rounded off properly for easy flow of water.

10.0 WOOD WORK:

10.1 The wood work in general shall be carried out as per CPWD Specifications.

10.2 The sample of timber to be used shall be deposited by the contractor with Engineer-incharge before commencement of work.

10.3 Glazing for toilets shall be of translucent type.

10.4 The shape and size of beading shall be as per drawings. The joints of beading shall be mitred.

10.5 Timber shall be of specified species, good quality and well seasoned. It shall have uniform colour, reasonably straight grains and shall be free from knots, cracks, shakes and sapwood. It shall be close grained. The contractor shall deposit the samples of species of timber to be used with the Engineer-in-Charge for testing before commencement of the work.

10.6 Wood work shall not be painted, oiled or otherwise treated before it has been approved by the Engineer-in-charge. All portion of timber including architrave abutting against masonry, concrete, stone or embedded in ground shall be painted with approved wood preservative or with boiling coaltar.

10.7 The contractor(s) shall produce cash voucher and certificates from approved Kiln Seasoning Plants about the timber used on the work having been kiln seasoned and chemically treated by them, falling which it would not be so accepted as kiln seasoned and/or chemically treated.

10.8 Transparent sheet glass conforming to IS: 2835 – 1977 shall be used. Thickness being governed as under unless otherwise specified in the item in wood work/steel work:

Area of Glazing Thickness

(a) For glazing area up to 0.50 sqm 4.0 mm
(b) For glazing area more than 0.50 sqm 5.5 mm

10.9 Factory made panelled / wire gauge door shutters

10.10 The work shall be executed through specialized agencies to be approved by the Engineer in Charge.

10.11 The shutters should be fabricated in factories & fabrication should conform to CPWD Specifications..

10.12 The contractor shall propose well in advance to Engineer-in-Charge, the names and address of the factory where from the contractor intends to get the shutters manufactured along with the credential of the firm. The contractor shall place the order for manufacturing of shutters only after obtaining approval of the Engineer in Charge whose

decision in this case shall be final & binding. In case the firm is not found suitable he shall propose another factory. The factory may also be inspected by a group of officers before granting approval; shutters shall however he accepted only if these meet the specified test.

10.13 Contractor will arrange stage wise inspection of the shutters at factory by the Engineer-in- Charge or his authorized representative. The contractor will have no claim if the shutters brought at site in part or full lot are rejected by the Engineer-in-Charge due to bad workmanship / quality. Such defective shutters will not be measured and paid. The contractor shall remove the same from the site of work with in 7 days after the written instruction in this regard are issued by the Engineer-in-Charge.

10.14 The shutters should be brought at site without primer / painting.

11.0. FINISHING:-

11.1 The work shall be done in accordance with CPWD Specifications.

11.2 All painting material of approved brand and manufacturer shall be brought to the site of work in the original sealed containers. The material brought to the site of work shall be sufficient for at least 30 days of work. The material shall be kept under the joint custody of contractor and representative of the by Engineer-in-charge. The empty containers shall not be removed from the site till the completion of the work without permission of the by Engineer-in-charge.

12.0 SANITARY INSTALLATIONS /WATER SUPPLY / DRAINAGE:-

12.1 The contractor shall submit schematic drawing of water supply and sanitary installation showing details of layout, including internal water supply and drainage details, showing the detail of water supply lines including fittings diameter wise and fixtures connecting to soil waste through traps and connection of W.C. to main shaft pipe for drainage including its ventilation system for approval of by Engineer-in-charge.

12.2 For the work of water supply and sanitary installations, the contractor shall engage the approved licensed plumbers and submit the name of proposed plumbing agencies with their credentials for approval of the Engineer-in-charge.

12.3 The work in general shall be carried out as per CPWD Specifications.

12.4 The tendered rates shall include the cost of cutting holes in walls, floors, RCC slabs etc. wherever required and making good the same for which nothing extra shall be paid.

12.5 The Centrifugally spun cast iron pipe IS: 3989-1984 wherever necessary shall be fixed to RCC columns, beams etc.with rawl plugs of approved quality and nothing extra shall be paid for on this account.

12.6 The pig lead to be used in the jointing should be as per CPWD specifications.

12.6 (a) The Centrifugally spun cast iron pipe IS: 3989-1984 wherever necessary shall be fixed to RCC columns, beams etc. with rawl plugs of approved quality and nothing extra shall be paid for on this account.

12.6. (b) Nothing extra for providing and fixing CP brass caps/ extension pieces wherever required for CP brass fittings shall be paid beyond the rates payable for corresponding CP brass fittings.

12.7 The pig lead to be used in jointing should be as per C.P.W.D. Specifications.

12.8 Nothing extra for providing & fixing CP Brass caps /extension pieces wherever required for CP Brass fittings shallbe paid beyond the rates payable for corresponding CP Brass fittings

13.0 **Aluminium doors, windows, ventilators etc. Glazing specifications:**

13.1 **Extent and Intent:** - The work shall be carried out through an approved Special Agency, who shall furnish all material, labour, accessories, equipment, tool and plants and incidentals required for providing and installing anodized aluminium doors, windows, claddings, louvers and other items as called for on the drawings. The drawings and specifications cover the major requirements only. The supplying of additional fastenings, accessories, fixtures and other items not mentioned specifically herein, but which are necessary to make a complete installation shall be a part of this contract.

13.2 **General:** - Aluminium doors, windows etc. shall be of sizes, section details as shown on the Architectural drawings. The details shown on the drawings indicate generally the sizes of the component parts and general standards. These may be varied slightly to suit the standard adopted by the manufacturers. Before proceeding with any manufacturing, the contractor shall prepare and submit complete manufacturing and installation drawings for approval of the by Engineer-in-charge and no work shall be performed until the approval of these drawings is obtained.

13.3 **Shop Drawings (architectural and structural drawings):** - The contractor shall submit the shop drawings of all architectural and structural drawings including door , windows, louvers, cladding and other aluminium work, based on the architectural drawings to the Engineer-in-charge for his approval. The shop drawing shall show full size sections of doors, windows etc. thickness of metal (i.e. wall thickness) details of construction, sub frame/rough ground profile, anchoring details hardware as well as connection of windows, doors and other metal work to adjacent work. Samples of all joints and methods of fastening and joining shall be submitted to the Engineer-in-charge for approval well in advance of commencing the work.

13.4 **Samples:** - Samples of doors, windows louvers etc. shall be fabricated, assembled and submitted to Engineer-in-Charge for his approval. They shall be of sizes, types etc. as decided by Engineer-in-Charge. All samples shall be provided at the cost of the contractor.

13.5 **Sections:** - Aluminium doors and windows shall be fabricated from extruded sections of profiles as detailed on drawings. The sections shall be extruded by the manufacturers approved by the Engineer-in-charge. The aluminum extruded sections shall conform to BIS designation IIE/IIV 9 WP alloy, with chemical composition technical properties, as per IS: 733 and IS: 1285. The permissible tolerance of the extruded sections shall be such as not to impair the proper and smooth function/ operations and appearance of doors and windows.

13.6 **Fabrication:** - Doors, windows etc. shall be fabricated to sizes at factory and shall be of section, sizes, combinations and details as shown on the drawings. All doors, windows etc. shall have mechanical joints. The joints shall be designed to withstand a wind load of 150 Kg. Per Sqm. The design shall also incur that the maximum deflection of any member shall not exceed 1/175 of the span of the member. All members shall be accurately machined and fitted to form hairline joints prior to assembly. The joints accessories such as cleats, brackets etc. shall be of such material as not to cause any bimetallic action. The design of the joints and accessories shall be such that the accessories are fully concealed. The fabrication of doors, windows, etc. shall be done in suitable sections to facilitate easy transportation, handling and installation. Adequate provision shall be made in the door and window members for anchoring to support and fixing of hardware and other fixture as approved by the Architect.

13.7 **Anodizing:** - All aluminum sections shall be anodized as per IS: 7088 and to required colour as specified in the item as per IS: 1868 grading as specified in item schedule after cutting the member to requisite sizes before the final assembly. Anodizing confirming to specified grade with minimum average thickness of 15 microns when measured as per IS: 612. The anodic coating shall be properly sealed by steams or in boiling water are cold sealing process as per IS:1868/IS: 6057. Polythene tape protection shall be applied on the anodised section before they are brought to site. All care shall be taken to ensure surface protection during transportation, storage at site and installation. The tape protection shall be removed on installation. The sample will be tested in the approved laboratory and cost of samples; cost of testing etc. shall be borne by the contractor.

13.8 **Protection of finish:** - All aluminum members shall be wrapped with approved self-adhesive non-staining. PVC tapes.

13.9 **Handling and Stacking: -**

13.9.1 Fabricated materials shall be carried in an approved manner to protect the material against any damage during transportation. The loading and unloading shall be carried out with utmost care. On receipt of material at site, it shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of

damaged pieces/ parts. Materials found to be acceptable on inspections shall be repacked in crates and stored safely.

13.9.2 In the case of composite windows and doors, the different units are to be assembled first. The assembled composite units should be checked for line, level and plumb before final fixing is done. Units may be serial numbered and identified as out how to be assembled in their final locations if situation so warrants.

13.9.3 The contractor shall be responsible for assembling composite, bedding and filling the grove with polysulphide sealant inside and outside, at transoms and mullions placing the doors, windows etc. in their respective openings. After the doors/ windows have been fixed in their correct assigned position, the open hollow sections abutting masonry concrete shall be fitted with approved polysulphide sealant densely packed and finished neat.

13.9.4 The contractor shall be responsible for doors, windows, etc. being set straight, plumb, level and for their satisfactory operation after fixing is complete.

13.10 **Installation: -**

13.10.1 Just prior to installation the doors, windows, etc. shall be uncreated and stacked on edge on level bearers and supported evenly. The frame shall be fixed into position true to line and level using adequate number of expansion machine bolts, anchor fasteners, of approved size and manufacture and in an approved manner. The holes in concrete/masonry members for housing anchor bolts shall be drilled with an electric drill.

13.10.2 The door/ windows assembled as shown on drawings shall be placed in correct final position on the opening and marks made on concrete members at jambs, sills and heads against the holes provided in frames for anchoring. The frame shall then be removed from the opening and laid aside. Neat holes with parallel sides of appropriate size shall then be drilled in the concrete members with an electric drill at the marking to house the expansion blots. The expansion bolts shall then be inserted in the holes, struck with a light hammer till the nut is forced into the anch ors hell. The frame shall then be placed in final position in the opening and anchored to the support thought cadmium plated machine screws of required size and anchored to the support through cadmium plated machine screws of required size threaded to expansion bolts. The frame shall be set in the opening by using wooden wedges at supports and be plumbed in position. The wedges shall invariably be placed at the meeting at points of glazing bars and frame.

13.11 **PVC/ Neoprene gaskets:** - The contractor shall provide and install PVC/ Neoprene gaskets of approved size and profile at all locations as shown and as called for to render the doors, windows etc. absolutely air tight and weather tight. The contractor shall produce samples of the gaskets for approval and shall procure the same after approval only.

13.12 Fittings: - Hinges, stays, handles, tower bolts, locks and other fittings shall be of quality and manufacturer as approved by the by Engineer-in-charge.

13.13 contractor's Attendance: - The manufacturer/contractor immediately prior to the commencement of glazing shall adjust and set all windows and doors and accept responsibility for the satisfactory working of the opening frames.

13.14 **Poly-sulphide:** -The gaps between frames and supports and also any gaps in the door and windows sections shall be raked out as directed and filled with poly-sulphide of approved colour and make to ensure complete water tightness. The poly-sulphide shall be of such colour and composition that it would not stain the masonry/concrete work, shall receive paint without bleeding, will not sag or run and shall not set hard or dry out under any conditions of weather. The sample of poly-sulphide to be used for this purpose shall be got approved from the architect before its actual use.

13.15 Details of Test: -

13.15.1 The various tests on aluminium sections shall be conducted in accordance with the relevant IS codes.

13.15.2 The minimum number of tests for anodizing and corrosion resistance shall be as given below: -

Sr. No	Details	No of tests
1	Doors, windows and ventilators	One test for every 1000 kg or part thereof

13.15.3 The samples of major member of each unit of doors/ windows shall be selected at random by Engineer-in-charge as such that all the aluminium section shall be got tested.

13.16 Acceptance Criteria: - The aluminium work shall carry guarantee after completion of work against unsound material, workmanship and defective anodizing/ powder coating as per guarantee bond. Guarantee in prescribed Performa attached under this NIT must be given by the specified firm, which shall be counter signed by the contractor, in token of his overall responsibility. ~~In addition to security deposit 10% (ten percent) of the cost of these items would be retained as security deposit and the additional security deposit amounts deducted would be released after two years from the date of completion of the entire work under the agreement,if the performance of the items is found satisfactory.~~ If any defect is noticed during the guarantee period, the contractor should rectify it within seven days and if not attended to the same will be got done from another agency at the risk and cost of contractor. However, this security deposit can be released in full if bank guarantee of equivalent amount is produced and deposited with the department.

13.17 Rates: -

13.17.1 The rates of the item shall include the cost of materials, labour required in all the above operations.

13.17.2 The rates include the cost of hinges/ pivots and rest of the fittings shall be paid separately.

14.0 SPECIFICATIONS FOR SOLID POLY VINYL CHLORIDE (PVC) DOOR SHUTTERS:

14.1.0 **SCOPE:**

14.1.1 This specification lays down requirement regarding types, sizes, material, construction, workmanship, finish, performance evaluation, sampling and testing of solid Poly Vinyl Chloride (PVC) Panelled door shutters for use in residential buildings, non-residential buildings such as offices, schools, hospitals, etc.

14.1.2 This specification does not cover large size door shutters for industrial and special buildings such as workshops, garages, godowns etc.

14.1.3 PVC door shutters shall be used in internal locations only.

14.2.0 **REFERENCES:**

14.2.1 The Indian Standards and other Standards listed in Annexure-I are necessary adjuncts to this standard. The products bearing BIS certification i.e. ISI Mark with code number shall have precedence over those not bearing ISI Mark.

14.3.0 **TERMINOLOGY:**

14.3.1 For the purpose of this specification, the definitions given below in addition to those given in IS 707-1976 shall apply:

14.3.1.1

(i) Blistering: Air or solvent entrapped during moulding.
(ii) Colour blots: Colour blots occurring on account of uneven distribution of pigment.
(iii) Crazing: Fine hair cracks on the surface.
(iv) Defective Impregnation: Imperfect impregnation of PVC resin with other additives.
(v) Colour Fading: Fading of colour on exposure to sunlight.
(vi) Impurities: Presence of matter other than those specified.
(vii) Pin holes: Pores of size less than 1mm appearing on the surface.
(viii) Small Pores: Pores of size more than 1mm but less than 2mm appearing on the surface.
(ix) Wrinkling: A slight ridge or furrow on surface.

(x) Aggregate Defects: Presence of defects such as pin holes, impurities and traces of mending 5 or more in aggregate for defects at localized place.

14.4.0 **HANDLING:**

14.4.1 Handling and direction of closing of shutters shall be designated in accordance with IS: 4043:1969.

14.5.0 **MATERIAL:**

12.5.1 Poly Vinyl Chloride Resin (suspension grade) is the basic raw material of PVC compound. PVC resin in mixed withchemicals like calcium searate, hydrocarbon Wax, Titanium dioxide, calcium carbonate Acrylic base etc. Furtheradditives like UV stabilizers, impact modifiers, pigments, epoxy plasticizer, lubricants, acrylic processing aid etc.are also added. The purpose of adding the chemicals and additives is to impart strength, surface finish, colour andresistance to fading by light rays. These chemicals are mixed in the desired proportion and shall be used in theformulation of PVC material and for free and smooth extrusion of PVC cellular sheets.

14.6.0 **PROCESS:**

14.6.1 MIXING: The PVC material so formulated with the addition of chemicals. fillers & additives shall be mixed drypowder form in a high speed hot mixer at a temperature of 1100 C to 1250 C. The heated dry blend is then to becooled at room temperature. However, the temperature has to be determined keeping in view the climatic conditions and the process requirements.

14.6.2 EXTRUSION: The cooled dry blend is off loaded into the hopper of the extruder, and then is fed to the screw &barrel of the extruder, where it is melted and kneaded at varying temperatures upto 2050 C by rotating screws. The thick paste of PVC material is then passed through a hot die to make the sheet of required thickness.

14.6.3 POLISHING: The basic shape of the sheet so acquired is then polished with the help of a three-roll calendar. At the same time the sheet is cooled by circulating water in the rolls of the calendar and there after on a roller table by atmospheric air.

14.6.4 CUTTING: The final finished product coming out of the haul-off is cut as per the required size.

15. SHEETS ROOFING:

15.1. <u>PRECOATED GALVANISED IRON PROFILE SHEET:</u>

15.1.1 Sheets shall be of the thickness specified in the description of the item and shall conform to IS 277.. The sheets shall be free from cracks, split edges, twists, surface flaws etc. They shall be clean, bright and smooth. The galvanising shall be non-injured and in perfect condition. The sheets shall not show signs of rust or white powdry deposits on the surface. The corrugations shall be uniform in depth and pitch and parallel with the side.

15.1.2 **Precoated galvanised iron profile sheets** (size,shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05 %) total coated thickness with zinc coating 120grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 metre or as desired by Engineer-in-charge.

The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto anypitch in horizontal/ vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.

15.2 **Percolated galvanized iron composite Insulated Profile Sheet(PUF Sheet):** As per standard specifications & BOQ given inside this tender document

16.0 REFERENCES:

16.1 The Indian Standards and other Standards listed in Annexure-I are necessary adjuncts to this standard. The products bearing BIS certification i.e. ISI Mark with code number shall have precedence over those not bearing ISI Mark.

17 **PAVER BLOCKS:** The paver blocks shall confirm to IS :15658: 2006 Testing and sampling shall be conducted to satisfy the code. The contractor shall submit the test certificate of paver blocks along with the supply of paver blocks.

18 **STAINLESS STEEL:** stainless steel (SS 304 grade) Grills of approved quality with necessary stainless steel screws etc. as per CPWD specifications & direction of Engineer in-charge complete.

19 **TOUGHNENED GLASS:** 12 mm thick frameless toughened glass of approved brand and manufacture as per site condition

20 **FALSE CEILING:** As per CPWD specifications & BOQ given inside this tender document

21 **LIST OF FIELD TESTS**

i) Particle size and shape
ii) Slump test
iii) Flakiness & Elongation Index tests
iv) Compressive strength (concrete or bricks) test
v) Bulking of sand
vi) Silt content of sand

vii) Temperature measuring with thermometer with brass protected end 0-200° C

22 FIELD TESTING EQUIPMENT AND INSTRUMENTS

A. Testing Equipment at Field Laboratories

i) Balances
a) 7kg to 10 kg. Capacity, Semi-self indicating type-Accuracy 10 gm
b) 500 gm. Capacity, Semi-self indicating type Accuracy 1 gm
c) Pan Balance – 5 Kg. Capacity, accuracy 10 gm.

ii) Sieves: as per IS 460-1962.
a) I.S. Sieves – 450 mm internal dia of sizes 100 mm, 80 mm, 63 mm, 50mm, 40 mm, 25 mm, 20 mm, 12.5 mm, 10 mm, 6.3 mm, 4.75 mm complete with lid and pan.
b) IS Sieves – 200 mm internal dia (brass frame) consisting of 2.36 mm, 1.18 mm, 600 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid and pan.

iii) Sieve shaker capable of 200 mm and 300 mm dia sieves, manually operated with timing switch assembly.

iv) Equipment for slump test – Slump Cone, Steel Plate, tamping rod, steel scale, scoop.

v) Graduated measuring cylinders 200 ml capacity

vi) Enamel trays (for efflorescence test for bricks and other tests)
a. 300 mm X 250 mm X 40 mm
b. Circular plates of 250 mm dia
c. 600 mm X 450 mm X 500 mm
d. 450 mm X 300 mm X 40 mm.

vii) ISI marked 150 X 150 X 150 mm concrete cube moulds as per site requirement.

viii) Graduated cylinder 1000 ml. Capacity.

B. Field Testing Instruments

i) Steel tape – 3 m
ii) Vernier Caliper
iii) Micrometer Screw 25 mm gauge
iv) A good quality plumb bob
v) Spirit level minimum 30 cms long with 3 bubbles for horizontal vertical
vi) Wire gauge (circular type) disc.
vii) Foot rule
viii) Long nylon thread

ix) Magnifying glass
x) Screw driver 30 cms long
xi) Ball pin hammer, 100 gms
xii) Plastic bags for taking samples
xiii) Digital Distance meter
xiv) Leveling machine
xv) Theodolite

C. **Minimum required T&P**

	Detail of T&P	Qty.	Remarks
1	Concrete mixer with hopper (Full bag)	2 Nos.	
2	Steel props	2000 cum space	
3	Steel Shuttering	600sqm	
4	Excavator cum loader	1 No.	
5	Plate Vibrator	2 Nos.	
6	Needle Vibrator	2 Nos.	
7	Floor grinding machine	2 Nos.	
8	Welding machine	2 Nos.	
9	Water pump	2 Nos.	
10 .	Concrete Pump	1 No.	

CEMENT/PAINT REGISTER

NAME OF WORK: DIVISION
AGREEMENT NO. SUB-DIVISION

Particulars of Receipt

Date of Receipt	Source of receipt with details if any	Batch No.	Date of manufacture	Date of expiry.	Qty. received	Progressive Total	Date of Issue	Qty issued	Items of work for which Issue	Qty. Returned at the end of day's work
1	2	3	4	5	6	7	8	9	10	11

Particulars of Issue

Net Qty Issued	Progressive total	Daily Balance in hand	Contractor's Initial	TA/TO INITIAL	Periodical Check	M.E/COMMITTEE
1	2	3	4	5	6	7

LIST OF PREFERRED MAKES FOR CIVIL WORKS

S.NO.	NAME OF PRODUCT/ MATERIAL	PREFERRED BRAND NAMES
1	ORDINARY PORTLAND CEMENT (GREY) (43 GRADE)	ACC, ULTRATECH, SHREE CEMENT, AMBUJA, JAYPEE CEMENT. CENTURY CEMENT & J.K. CEMENT.
2	PORTLAND POZZOLONA CEMENT (GREY) (43 GRADE)	ACC, ULTRATECH, SHREE CEMENT, AMBUJA, JAYPEE CEMENT, CENTURY CEMENT & J.K. CEMENT.
3	WHITE CEMENT	J.K.WHITE, JAIPUR SUPREME PACKAGINGPVT. LTD., ULTRATECH CEMENT LIMITED.
4	REINFORCEMENT STEEL	SAIL, TATA STEEL LTD., RINL, JINDAL STEEL & POWER LTD. AND JSW STEEL LTD.
5	ADMIXTURES	CICO, FAIRMATE, HIND PLAST SUPER, SUPAPLAST, SIKKA
6	WATER PROOFING COMPOUND	FOSROC, CICO, KRYTON BUILDMAT. PIDILITE, PRIYA ENTERPRISES, FAIRMATE
7	READY MIX CONCRETE	M/S L&T CONCRETE (LAFARGE), ULTRATECH CEMENT LTD., ACC CONCRETE LTD., RMC READY MIX (INDIA) PVT. LTD.
8	AUTOCLAVED AERATED BLOCKS	BILTECH, ECO GREEN, FINECRETE, J.K. LAKSHMI CEMENT LTD.
9	POLYMER MODIFIED	MYK LATICRETE, FERROUS CRETE,

	ADHESIVE FOR AAC BLOCKS	ARDEX ENDURA, ULTRATECH, SIKKA.
10	**FACTORY MADE PANELLED & WIRE GAUGE WOODEN DOOR/ WINDOW SHUTTERS.**	M/S JAIN WOOD INDUSTRIES, KUTTY DOORS, SAMRAT PLYWOOD, NEW JAGDAMBA DOORS, MERINO, KITPLY, AS TIMBER
11	**FLUSH DOOR SHUTTERS**	KUTTY FLUSH DOOR, SAMRAT LAMINATE, NATIONAL PLYWOODS, JAIN WOOD INDUSTRIES, MERINO, KITPLY, CENTURY, AS TIMBER
12	**BLOCK BOARD**	MERINO, KITPLY, NATIONAL, ARCHIDPLY, CENT PLY, JAYNA, CENTURY.
13	**LAMINATES**	SAMRAT, VIRGO, MERINO, ARCHIDPLY, CENTURY LAMINATES, GREENLAM
14	**PRE-LAMINATED PARTICLE BOARD**	ARCHIDPLY, CENTURY PLY BOARDS, BALAJI ACTION BUILDWELL, ECOBOARD
15	**PARTICLE BOARD (MEDIUM DENSITY)/ VENEERED PARTICLE BOARD**	CENTURY PLYBOARDS (INDIAN) LTD., BALAJI ACTION BUILDWELL, EVERGREEN BOARDLAM, ECOBOARD INDUSTRIES LTD.
16	**PRE-LAMINATED MEDIUM DENSITY FIBRE BOARD**	CENTURY PLYBOARDS, GREEN PLY, BALAJI ACTION BUILDWELL
17	**OMS/ MS DOOR FITTINGS**	ASHISH, AGGARWAL STEELS, DOOR DEVICES MANUFACTURING COMPANY, MANU ENGINEERING COMPANY, M.C. MOWJEE & CO., SHRI GANPATI DOORS
18	**HYDRAULIC DOOR CLOSER**	HARDWYN, EVEREST, HYPER, UNIVERSAL, SUDARSHAN INDUSTRIES
19	**STAINLESS STEEL DOOR/WINDOW HARDWARE FITTINGS (FIRE RATED AND NON-FIRE RATED)**	DORMA, ASSA ABLOY, GEZE, D-LINE

20	ANODISED/ ZINC ALLOY/ ALUMINIUM HARDWARE DOOR/ WINDOW FITTINGS	PULSE, SAVIO, HOPPE, ALUTECH
21	FRP DOOR FRAMES & SHUTTERS	ASHISH INDUSTRIES, JAYNA, SAINIK (CENTURY PLYWOOD), SELECTED PRODUCTS CO.
22	UPVC WINDOWS/ DOORS	VEKA, FENESTA, REHAU, ALUPLAST
23	UPVC WINDOW/ DOOR HARDWARE FITTINGS (ZINC ALLOY)	PULSE, HOPPE, GU, ROTO
24	WIDOWS BLINDS	VISTA, MAC, HUNTER, DOUGLAS, DE-DÉCOR
25	STRUCTURAL STEEL SUCH AS MS FLATS, SQ.BARS ANGLES ETC.	SAIL, TATA STEEL, RINL, JINDAL STEEL &POWER LTD. AND JSW STEEL LTD
26	FIRE RATED DOORS (METTALIC/ NON METTALIC)	KUTTY DOORS, NAVAIR, PROMAT, SYNERGY THRISLINGTON
27	HOT-ROLLED STEEL SECTIONS FOR MS DOORS, WINDOWS AND VENTILATORS	NAV DURGA STEEL CORPN, CRM STEELS P. LTD, SHYAM ISPAT UDYOG, VIMAL, SHIV
28	MILD STEEL DOOR, WINDOWS & VENTILATORS MANUFACTURERS	FRIENDS MANUFACTURING COMPANY, KOTKAPURA, PD INDUSTRIES, SHAKTI INDUSTRIES, STEELMAN INDUSTRIES, SKS STEEL INDUSTRIES, SHIVAM
29	PRESSED STEEL DOOR FRAMES MANUFACTURERS	KRISHNA STEEL FABRICATOR SIRSA, LAXMI STEEL WORKS BAHADURGARH, ASHISH INDUSTRIES GHAZIABAD, ASHWANI & SONS.
30	HOLLOW STEEL SECTIONS	JINDAL INDUSTRIES HISAR, TATA STEEL, STEEL & METAL TUBES (INDIA)PVT. LTD
31	STEEL TUBES FOR STRUCTURAL STEEL	JINDAL INDUSTRIES HISAR, TATA STEEL, STEEL & METAL TUBES (INDIA) PVT. LTD.
32	DASH/ ANCHORING	HILTI , FISCHER, CKW, ATUL, PRIYA

	FASTENERS, BOLTS, SCREWS AND NUTS.	
33	**STAINLESS STEEL RAILING**	DORMA, KICH, OM STEEL , D-LINE.
34	**CHEQUERRED PRE-CAST CC TILES**	NTC, SWASTIK TILE, POOJA CONCRETE FABRICATORS, GTC
35	**CERAMIC TILES**	SOMANY, ORIENTBELL, RAK, ASIAN GRANITO INDIA LTD.
36	**VITRIFIED TILES**	SOMANY, ORIENTBELL, RAK, ASIAN GRANITO INDIA LTD.
37	**ADHESIVE/ GROUTING FOR USE WITH TILES**	FERROUS CRETE, MYK LATICRETE, ARDEX EDURA, FAIRMATE, DURA BUILD CARE, SIKKA
38	**WOODEN LAMINATE FLOORING**	PERGO, KRONOTEX, FLORENCE, UNITEX, ACTION TESA
39	**UNPLASTICISED RIGID PVC PIPE & FITTINGS**	A S H IRVAD , FLOWGUARD, FINOLEX, RAKSHA
40	**GALVANISED STEEL SHEETS (UNCOATED & PRE-COATED)**	SAIL, TATA, BHUSHAN POWER STEELS, JINDAL
41	**ROOFING SHEETS (GALVALUME)**	CRIL, LLOYDS, INTERACH, MULTICOLOR, BHUSHAN POWER STEEL
42	**FALSE CEILING- GYPSUM**	SAINT GOBAIN, VANS GYPSUM, USG BORAL, LLYOD
43	**FALSE CEILING- METAL**	ARMSTRONG, DEXUNE, SAINT GOBAIN, HUNTER DOUGLAS, GYPTECH
44	**FALSE CEILING- CALCIUM SILICATE**	HILUX, AEROLITE, ARMSTRONG
45	**FALSE CEILING-MINERAL FIBRE**	ARMSTRONG, DEIKEN, DEXUNE, SAINT GOBAIN.
46	**ACCOUSTIC: GLASS / WOODEN FIBRE FALSE CEILING AND WOODEN/ FABRIC WALL LINING**	ARMSTRONG, DEXUNE, ACCOUSTIBLOK, HIMALYAN ACOUSTICS, ANUTONE, GYPTECH
47	**FALSE CEILING-ALUMINIUM**	ARMSTRONG, DEXUNE, SAINT

	POWDER COATED	GOBAIN, HUNTER DOUGLAS
48	**LIGHT WEIGHT GYPSUM PLASTER**	SAINT GOBAIN, ULTRATECH, FERROUS CRETE, USG BORAL.
49	**OIL BOUND DISTEMPER/ ACRYLIC DISTEMPER ***	NEROLAC ACRYLIC DISTEMPER, TRACTOR ACRYLIC DISTEMPER (ASIAN PAINTS), MAXILITE ACRYLIC DISTEMPER (ICI), BISON ACRYLIC DISTEMPER (BERGER).
50	**INTERIOR EMULSION/ PLASTIC EMULSION***	DULUX ACRYLIC EMULSION/ SOLITAIRE A-1000 (ICI), APCOLITE PREMIMUM EMULSION (ASIAN), BEAUTY GOLD (NEROLAC), SILK (BERGER)
51	**ACRYLIC SMOOTH EXTERIOR PAINT***	APEX ULTIMA (ASIAN), DULUX WEATHERSHEILD MAX (ICI), EXCEL (NEROLAC), WEATHERCOAT ALL GUARD (BERGER)
52	**DRY DISTEMPER***	NEROLAC, BERGER, ASIAN PAINTS, ICI, JENSON & NICHOLSON (J&N)
53	**TEXTURED EXTERIOR PAINT***	NEROLAC, BERGER, ASIAN PAINTS, ICI
54	**SYNTHETIC ENAMEL PAINTS***	DULUX HI-GLOSS (ICI), APCOLITE PREMIMUM GLOSS (ASIAN), NEROLAC HIGH GLOSS (NEROLAC), LUXOL HIGLOSS (BERGER)
55	**WOOD PRIMER***	NEROLAC, BERGER, ASIAN PAINTS, ICI
56	**STEEL PRIMER***	NEROLAC, BERGER, ASIAN PAINTS, ICI
57	**EXTERIOR WALL PRIMER***	EXTERIOR NEROLAC PRIMER, EXTERIOR BERGER PRIMER, EXTERIOR ASIAN PAINTS PRIMER, EXTERIOR ICI PRIMER
58	**WALL PUTTY (WHITE CEMENT BASED)**	BIRLA WALL CARE, JK WHITE, SARA WALL PUTTY
59	**POLYMER MODIFIED SELF**	MYK LATICRETE, FERROUS CRETE,

	CURING PLASTER	ARDEX ENDURA, ULTRATECH
60	**PAVER/ GRASS PAVER BLOCKS & KERB STONES**	SHIV SHAKTI, PUNEET TILES, NATIONAL TILES CORPORATION, SARAL IMPEX, BALAJI TILES, METRO PAVERS, MGM INFRA, KRISHNA TILES, POOJA CONCRETE FABRICATORS, GIAN NIRMAN LIMITED.NITCO
61	**VITREOUS CHINA SANITARY WARE**	HINDWARE, CERA, PARRYWARE, JOHNSON PEDDER, NEYCER
62	**PLASTIC FLUSHING CISTERN FOR WC AND URINALS**	JINDAL, STEEL BIRD, SEEMLINE, VIKRAM PLASTIC, PRAYAG POLYMERS (P) LTD.
63	**PLASTIC SEAT COVER OF W.C.**	AJANTA POLYMERS, JINDAL MALPINE, JAIN POLYMERS
64	**STAINLESS STEEL SINK**	ALLEX, JAYNA, JMD INTERNATIONAL, STEEL CRAFT
65	**MIRROR GLASS**	ATUL, MODIGUARD, GOLDEN FISH
66	**CENTRIFUGALLY CAST (SPUN) IRON PIPES**	NECO, BENGAL IRON, DURGAPUR ISPAT UDYOG, SINGHAL IRON FOUNDRY (SKF), KAPILANSH DHATU UDYOG PVT. LTD., HIF, BINAY UDYOG
67	**HUBLESS CENTRIFUGALLY CAST (SPUN) IRON PIPES**	NECO, RAJ PATTERN MAKERS & FOUNDERS, SKF
68	**CP FITTINGS & ACCESSORIES**	JAQUAR, HINDWARE, PRIMA, CERA, JAL
69	**BRASS STOP & BIB COCK**	DHAWAN SANITARY UDYOG, JAINKO, SHAKTI, VARDHMAN INDIA PRODUCTS
70	**FERRULES FOR WATER SUPPLY**	HIND METAL WORKS, KRITIKA, DRP, SHAKTI
71	**BALL COCK WITH ROD**	RESP FAUCET INDUSTRIES, DHAWAN SANITARY UDYOG, NEW METAL WORKS, KPR, PRAYAG.
72	**POLYETHYLENE WATER**	SINTEX, VECTUS, KAVERI

	STORAGE TANK	
73	STONEWARE PIPES & GULLY TRAPS	SORKHI INDUSTRIES, RK INDUSTRIES, NAVNEET, MOLI CERAMICS, OCR, ANAND
74	PRE-CAST CONCRETE PIPES (NON-PRESSURE)	RAMNIK, BFSP, JAGDAMBEY SPUN PIPE, GURKIRPA SPUN PIPES
75	GI PIPE	JINDAL (HISSAR), TATA, PRAKASH SURYA, BST, BHUSHAN POWER STEEL
76	GI FITTINGS	UNIK, AVR, ZOLOTO, SANT, HBI, C-BRAND, NVR
77	C-PVC PIPE	ASHIRVAD, FLOWGUARD, FINOLEX, RAKSHA.
78	WATER METER	CRESCENT, PRINCE, FEDREL, DASHMESH, NBESON, SANT
79	GUN METAL GATE, GLOBE, CHECK VALVES & NON-RETURN VALVES	LEADER, ZOLOTO, SANT, RAJAN METAL INDUSTRIES, H.B. METALS, HVI, NVR.
80	CENTRIFUGALLY CAST (SPUN) IRON PIPES (CLASS LA).	TRU FORM ENGINEERS, KAPILANSH. ELECTROSTEEL, HITECH METAL CASTINGS.
81	C.I. SLUICE VALVES & REFLEX VALVES	ZOLOTO INDUSTRIES, SANT VALVES, AMCO INDUSTRIES, KIRLOSKAR, RATAN INDUSTRIAL CORPORATION, HVI, NVR.
82	STAINLESS STEEL PIPES & FITTINGS	JINDAL STAINLESS STEEL, OM STEEL GROUP, V STEEL, VIEGA, RAMPART INDIA PVT. LTD.,
83	DUCTILE IRON PIPES & FITTINGS	JINDAL SAW LTD, ELECTRO STEEL, CHANDRANCHAL INFRA, ELECTROTHERAM
84	C.I./ D.I. MANHOLE COVERS & FRAMES	SWASTIKA ENTERPRISES, BENGAL IRON CORPORATION, NECO, BINAY UDYOG, CHANDERANCHAL
85	WATER REPELLANT SILANE CHEMICAL	PIDILITE, FERROUS CRETE, ARDEX ENDURA

86	ALUMINIUM SECTIONS	HINDALCO, JINDAL, INDIAN ALUMINIUM CO.
87	BASIC/ TOUGHENED ETC. GLASS	SAINT GOBAIN, ASAHI, MODI, GOLD PLUS GLASS, PILINGTON
88	APPROVED PROCESSORS FOR PERFORMANCE GLASS/ TOUGHENED GLASS/ HERMETICALLY SEALED/ LACQUERED GLASS etc	ART & GLASS, MIRAGE TOUGHENED GLASSES (P) LTD.,AAR PAR GLASS, VERMA GLASS.
89	STRUCTURAL GLAZING	ALCOB, ALUPRO, ALUPLAX, SP FABRICATORS, SAINT GOBAIN, GLAVERBEL.
90	FAÇADE GLASS OPENABLE FITTINGS	ALUALPHA, SAVIO, HOPPE, ALUTECH
91	GLASS FAÇADE/ GLASS CANOPY WITH SS SPIDER FITTINGS	ALCOB, ALUPRO, ALUPLAX, SP FABRICATORS, SAINT GOBAIN, GLAVERBEL.
92	FRAMELESS GLAZING WITH SS PATCH FITTINGS	DORMA, ASSA ABLOY, GEZE, D-LINE

*Batch test certificate of cement, steel, aluminium, Paints and Primer shall be supplied along with each lot including testing of material & approved govt lab at contractor's own cost and arrangements .

*If any further material other than this approved list may be require to use (in non availability case). First approval may be taken from engineer-in-charge

SIGNATURE OF CONTRACTOR

BILL OF QUANTITIES

Estimate for Providing one parking shed, railing, Aluminium frame/wire mesh in balconies, Rain water harvesting system, paver block flooring, and other flooring/plastering/RCC repair works etc. of various hostels at ICAR-NDRI, Karnal.

Sr. No	ITEM	QTY & UNIT	RATE PER UNIT (in rupees)	Total AMOUNT (in Rupees)
1.	Earth work in excavation by mechanical means (Hydraulic excavator) /manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	150 cum	252.30 per cum	37845.00
2.	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead upto 50 m and lift up to 1.5 m.	70 cum	219.65 Per cum	15375.50
3.	Excavating, supplying and filling of local earth (including royalty) by mechanical transport upto a lead of 5km also including ramming and watering of the earth in layers not exceeding 20cm in trenches, plinth, sides of foundation etc. complete.	60 cum	323.90 cum	19434.00
4.	Surface dressing of the ground including removing vegetation and inequalities not exceeding 15 cm deep and disposal of rubbish, lead upto 50 m and lift up to 1.5 m. All kinds of soil	917.95 sqm	24.35 per sqm	22352.08
5.	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:2:4 (1 cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size)	127 cum	6788.60 per cum	862152.20
6.	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) : 8 graded stone aggregate 40 mm nominal size	149 cum	5789.60 per cum	862650.40
7.	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:5:10 (1 cement : 5 coarse sand (zone-III): 10 graded stone aggregate 40 mm nominal size)	15 cum	5520.30 per cum	82804.50

8.	Providing and laying damp-proof course 40mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III): 4 graded stone aggregate 12.5mm nominal size)	5 sqm	347.90 per sqm	1739.50
9.	Providing & applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7kg per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	5 sqm	110.00 per sqm	550.00
10.	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).	2 cum	9763.80 per cum	19527.60
11.	Centering and shuttering including strutting, propping etc. and removal of form for : Suspended floors, roofs, landings, balconies and access platform with water proof ply 12 mm thick	10 sqm	779.30 per sqm	7793.00
12	Centering and shuttering including strutting, propping etc. And removal of form for: Lintel, beams, plinth beams, girders, bressumers and cantilevers with water proof ply 12 mm thick	130 sqm	641.60 per sqm	83408.00
13.	Extra for additional height in centering, shuttering where ever required with adequate bracing, propping etc., including cost of de-shuttering and decentering at all levels, over a height of 3.5 m, for every additional height of 1 metre or part thereof (Plan area to be measured). Suspended floors, roofs, landing, beams and balconies (Plan area to be measured)	300 sqm	287.50 per sqm	86250.00
14.	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more	700 kg	83.50 per Kg	58450.00
15.	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse sand)	41.50 cum	6376.25 per cum	264614.38
16.	Brick work with common burnt clay modular bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse	1 cum	5495.15 per cum	5495.15

	sand)			
17.	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in :Cement mortar 1:4 (1 cement : 4 coarse sand)	8 Cum	5559.25 per cum	44474.00
18.	Half brick masonry with common burnt clay F.P.S. (non modular) bricksof class designation 7.5 in superstructure above plinth level up to floor V level. Cement mortar 1:4 (1 cement :4 coarse sand)	57 sqm	932.10 per sqm	53129.70
19.	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. Complete. Hot finished welded type tubes	2500 kg	143.45 per kg	358625.00
20.	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required. In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works.	7990 kg	131.00 per kg	1046690.00
21.	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes. 75 mm diameter	24 metre	201.10 per metre	4826.40
22.	Providing and fixing precoated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge)0.50 mm (+ 0.05 %) total coated thickness with zinc coating 120grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 metre or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto anypitch in horizontal/ vertical or curved surfaces, excluding the cost of purlins,	376 sqm	627.55 per sqm	235958.80

	rafters and trusses and including cutting to size and shape wherever required.			
23.	Providing and fixing precoated galvanised steel sheet roofing accessories0.50 mm (+0.05 %) total coated thickness, Zinc coating 120 gramsper sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 icronsusing self drilling/ self tapping screws complete : Ridges plain (500 - 600mm)	30 metre	416.30 per metre	12489.00
24.	Providing and fixing precoated galvanised steel sheet roofing accessories0.50 mm (+0.05 %) total coated thickness, Zinc coating 120 gramsper sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 micron susing self drilling/ self tapping screws complete : Gutter (600 mm over all girth)	60 metre	1041.75 Per metre	62505.00
25.	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	170 sqm	266.85 per sqm	45364.50
26.	12 mm cement plaster of mix :1:4 (1 cement: 4 coarse sand)	370 sqm	276.15 Per sqm	102175.50
27.	15 mm cement plaster on rough side of single or half brick wall of mix: 1:4 (1 cement: 4 coarse sand)	370 sqm	318.95 per sqm	118011.50
28.	Distempering with **1st quality acrylic distemper (ready mixed) having VOC content less than 50 gms/litre**, of approved manufacturer, of required shade and colour complete, as per manufacturer's specification.	675.56 sqm	87.15 Per sqm	58875.05
29.	Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr /10 sqm over and including priming coat of exterior primer applied@ 2.20 kg/10 sqm)	1010 sqm	164.70 per sqm	166347.00
30.	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade : Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture	54 sqm	177.15 per sqm	9566.10
31.	Providing and applying white cement based putty of average thickness1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	800 sqm	115.15 per sqm	92120.00
32.	6 mm plaster on cement concrete or reinforced cement concrete work with white cement based polymer modified self curing mortar of approved make as per the direction of Engineer-In-Charge.	990 sqm	205.50 per sqm	203445.00

33.	Removing dry or oil bound distemper, water proofing cement paint and the like by scrapping, sand papering and preparing the surfaces mooth including necessary repairs to scratches etc. complete.	500 sqm	18.25 per Sqm	9125.00
34.	Repairs to plaster of thickness 12 mm to 20 mm in patches of area 2.5 sq. meters and under, including cutting the patch in proper shape, raking out joints and preparing and plastering the surface of the walls complete, including disposal of rubbish to the dumping ground, all complete as per direction of Engineer-in-Charge. With cement mortar 1:4 (1cement: 4 coarse sand)	400 sqm	429.60 per sqm	171840.00
35.	Raking out joints in lime or cement mortar and preparing the surface for re-pointing or replastering, including disposal of rubbish to the dumping ground, all complete as per direction of Engineer-in-Charge.	750 sqm	51.70 per sqm	38775.00
36.	Flush pointing with cement mortar 1:3 (1 cement : 3 fine sand) mixed with 2% of integral water proofing compound by weight of cement for flat tile bricks on top of mud phaska : With F.P.S. brick tiles	750 sqm	103.45 per sqm	77587.50
37.	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer - in- charge.	55 cum	2534.70 per cum	139408.50
38.	Extra for cutting reinforcement bars manually/ by mechanical means in R.C.C. or R.B. work (Payment shall be made on the cross sectional area of R.C.C. or R.B. work) as per direction of Engineer-in-charge.	98 sqm	863.35 per sqm	84608.30
39.	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge. In cement mortar	7.72 cum	1469.90 per cum	11347.63
40.	Removing mortar from bricks and cleaning bricks including stacking within a lead of 50 m (stacks of cleaned bricks shall be measured): From brick work in cement mortar	3860 Nos	4.80 Per bricks	18528.00
41.	Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground within 50 metres lead.	800 sqm	39.00 per sqm	31200.00
42.	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M -30	530 sqm	859.35 per sqm	455455.50

	grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.			
43.	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete : 250 mm dia. R.C.C. pipe	135 metre	754.45 per metre	101850.75
44.	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/Neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C. P.brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, panelling and dash fasteners to be paid for separately) : Anodised aluminium (anodised transparent or dyed to required shade according to IS:1868, Minimum anodic coating of grade AC15)	1000 kg	423.95 per kg	423950.00
45.	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part 1), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer-in-charge, upto 90 meter depth below ground level. All types of soil300 mm dia	20 metre	512.30 per metre	10246.00
46.	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, asper direction of Engineer -in-charge. 150 mm nominal size	20 metre	690.75 per metre	13815.00

47.	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in recharge pit, in the required thickness, for all leads& lifts, all complete as per direction of Engineer-in-charge.	1.80 cum	1326.55 per cum	2387.79
48.	Supplying, filling, spreading & leveling gravels of size range 5 mm to 10 mm, in the recharge pit, over the existing layer of boulders, in required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	1.80 cum	1326.55 per cum	2387.79
49.	Supplying, filling, spreading & leveling coarse sand of size range 1.5mm to 2 mm in recharge pit, in required thickness over gravel layer, for all leads & lifts, all complete as per direction of Engineer - incharge.	1.80 cum	1326.55 per cum	2387.79
50.	Providing and fixing factory made precast RCC perforated drain covers, having concrete of strength not less than M-25, of size 1000 x 450x50mm, reinforced with 8 mm dia four nos longitudinal & 9 nos cross sectional T.M.T. hoop bars, including providing 50 mm dia perforations@ 100 to 125 mm c/c, including providing edge binding with M.S. flats of size 50 mm x 1.6 mm complete, all as per direction of Engineer in-Charge	40 Nos	1210.85 each	48434.00
51.	Providing and fixing of aluminium wiremesh25mmx50 mm x3mm thick in aluminium frame including screw and dash fastner etc complete	732.29 kg	354.00 per kg (M.R.)	259230.66
52.	Providing and fixing Dash hold fastener 12.5 mm dia, 50 mm long with 6 mm dia bolt	238 Nos	11.00 each	2618.00
53.	Providing and fixing of chicken mesh for double coat cover plastering of balconies	100 kg	472 per kg (M.R.)	47200.00
	TOTAL			**6997427.07**
	SAY			**6997427.00**

Name of work: Estimate for Providing one parking shed, one open sitting shed with PUF sheet roofing and SS furniture/ railing, Aluminium frame/wire mesh in balconies, Rain water harvesting system, paver block flooring, and other flooring/plastering/RCC repair works etc. of various hostels at ICAR-NDRI, Karnal.	
Estimated cost put to Tender	Rs. 6997427.00

PERFORMA FOR QUOTING THE RATES

Name of contractor				
Sr. No.	**Estimated cost (Rs.)**	**Percentage above below the estimated /cost in words**	**% in figures**	**Total Cost (Rs.) (In figures)**
1	6997427.00			

Total Cost (In words).....

SIGNATURE OF CONTRACTOR