

Tender Document:

Name of Work: Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works).

NIT No. 25/C/D1/2019-20

- Note-1:-** The intending bidder must read the terms and conditions carefully. He should submit his bid only if he considers himself eligible and he is in possession of all the documents as required.
- Note-2:-** The intending bidder must upload all the documents as detailed in this tender document **S. No 1 to S. No 5 in Para 21 on pages 10** of this document.
- Note-3:-** Applicants are advised to keep visiting www.iitk.ac.in/iwd/tenderhall.htm, www.tenderhome.com and www.eprocure.gov.in/eprocure/app from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updates thereof, if any. An incomplete application may be liable for rejection.
- Note-4:-** The EMD shall be prepared in favour of **the Director, IIT Kanpur payable at Kanpur** as detailed in the tender document. A part of EMD is acceptable in the form of bank guarantee as per the details in the tender document. This bank guarantee shall also be in favour of **the Director, IIT Kanpur**
- Note-5:-** **The defect liability period is 36 months** from the date of handing over the completed building to the engineer in charge. Other related details are elaborated in the tender document.
- Note-6:-** The contractor shall also carry out the structural analysis and design of the Pre Engineered Steel structure, preparation of GA drawings, working & shop drawings and the complete design system to be vetted by structural designer of IIT/NIT/Any government Institute.
- Note-7:-** Site inspection, if desired, by the intending bidders will be arranged on 20/01/2020 at 11:30 AM. The intending bidders must reach the O/o the Executive Engineer, IWD, IIT Kanpur -208016. The construction site is inside the IIT Kanpur Campus. The intending bidders shall arrange for the conveyance themselves.
- Note-8:-** The indicative drawings are enclosed.
- Note-9:-** The following condition pertains to GST of Clause 37 & 38 of General Condition of contracts and corresponding amendments should be read as follows:-
- The quoted rates should be exclusive of GST.
 - The GST as applicable shall be paid extra.

**INDIAN INSTITUTE OF TECHNOLOGY, KANPUR
INSTITUTE WORKS DEPARTMENT
CENTRAL OFFICE**

TENDER DOCUMENT

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Notes: The following will be the part of the contract Agreement:

- 1. The soft copy of the GCC 2014 and Amendments is hereby uploaded separately.**

Estimated Cost Rs 2,43,95,261.00/- (Rupees Two Core Fourty Three Lac Ninety Five Thousand Two Hundred Sixty One Only)

**Sr. Assistant Engineer (S.G)
(Civil)**

**Executive Engineer
(Civil)**

Approved by

Superintending Engineer

SECTION –A

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR
INSTITUTE WORKS DEPARTMENT
CENTRAL OFFICE**

Notice Inviting e-Tender No. 25/C/D1/2019-20

The Superintending Engineer, IWD, IIT Kanpur invites on behalf of Board of Governors of IIT Kanpur online percentage rate tenders on single bid system from the enlisted contractors of CPWD, BSNL, MES, UPPWD & Central PSUs in appropriate class and category.

| Sl. No. | Name of work | Estimated cost (in Lacs) | Earnest money (in Rs) | Period of completion |
|---------|---|--------------------------|-----------------------|----------------------|
| 1. | Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works). | Total Cost Rs 243.95 | 4,87,905.00 | 6 months |

Last date & time of submission of bid **on 01.02.2020 upto 5.00 PM**. All details are available on website, <https://eprocure.gov.in/eprocure/app>, www.tenderhome.com & www.iitk.ac.in/iwd/tenderhall.htm. The bids can only be submitted online at www.eprocure.gov.in/eprocure/app.

No. IWD/CO/2019-20/ 675 Dated: 09.01.2020

Superintending Engineer

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**INDIAN INSTITUTE OF TECHNOLOGY KANPUR
INSTITUTE WORKS DEPARTMENT
CENTRAL OFFICE**

Section –A

Name of Work: Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works).

C.P.W.D-6**INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR e-TENDERING
FORMING PART OF NIT AND TO BE POSTED ON WEBSITE**

The Superintending Engineer, on behalf of Board of Governors, IIT Kanpur, invites online percentage rate tenders from eligible firms/contractors* for the following work:

| S.N | NIT No. | Name of work and location | Estimated cost put to tender | Earnest | Period of | Last date & time for online | Last date for submitting hardcopy of EMD, and other documents | Time & date of opening of technical bid |
|-----|-----------------|---|------------------------------|-----------------|-----------|-----------------------------|---|---|
| 1 | 25/C/D1/2019-20 | Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works). | Rs 24395261/- | Rs. 4,87,905.00 | 06 Months | Upto 5.00 PM on 01.02.2020 | After last date and time of submission of tender and upto 5:00 PM on 03/02/2020 | Opening at 11:30 AM on 04.02.2020 for eligibility documents and 3:00 PM on 04.02.2020 for financial bids. |

Note: The contractor submitting the tender should read the schedule of quantities, additional conditions, additional specifications, particular specifications, CPWD- 6 and other terms and conditions given in the NIT and drawings. The bidder should also read the General Conditions of Contract for CPWD Works 2014 with correction slips, upto the date specified in schedule-F, which is available as Government of India Publications.

1) Contractors who fulfill the following requirements shall be eligible to apply. Joint ventures are not accepted:

a) Should have satisfactorily completed the works as mentioned below during the last seven years ending previous day of last date of submission of bids.

* 3 (three) similar completed works costing not less than **Rs. 97.58 Lacs** or 2 (two) similar completed works, not less than **Rs 146.37 Lacs** or 1 (one) similar completed work of aggregate cost not less than **Rs 195.16 Lacs**.

And

One completed work of any nature (either part of (a) or a separate one) costing not less than **Rs 97.58 Lacs** with some Central Government Department / State Government Department / Central Autonomous Body / Central Public Sector Undertakings).

- Note:** The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to the previous day of last date of submission of bids.
- b) Should have average annual financial turnover of **Rs. 121.98 Lacs** construction works during the last three years ending 31/03/2019
 - c) Should not have incurred any loss in more than two years during the last five years ending 31/03/2019.
 - d) Should have solvency of **Rs 97.58 Lacs**.
 - e) Should have valid registration with EPF, ESIC and GST authority.
2. The intending bidder must read the terms and conditions carefully. He should submit his bid only if he considers himself eligible and he is in possession of all the documents required.
 3. Information and Instructions for bidders posted on website shall form part of bid document.
 4. The bid document consisting of the schedule of quantity, terms and condition, i/c plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen in the office the Engineer-in-Charge between hours of **11:00 AM and 4:00 PM from date of publicity of tender to date of submission of tender every day** except on Saturday, Sunday and public holidays or can be seen and downloaded from website www.iitk.ac.in/iwd/tenderhall.htm, www.tenderhome.com, and www.eprocure.gov.in/eprocure/app free of cost.
 5. Those contractors not registered on the website mentioned above, are required to get registered beforehand. If needed they can be imparted training on online bidding process as per details available on the website.
 6. The intending bidder must have valid class-III **digital signature** to submit the bid.
 7. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
 8. Contractor can upload the documents in the form of **JPG** format and **PDF** format.
 9. **If a tenderer does not quote any percentage above/below on the total amount of the tender or any section/sub head in the percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.**
 10. The **documents** (Consisting of the enlistment copy, Copy of GST registration etc) shall be **opened first** on due date and time as mentioned above. The financial bid shall be opened only of the bidders whose documents is found in order.
 11. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.
 12. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
 13. **a)** Earnest Money in the form of Demand Draft or Pay order or Banker's Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of the Director, IIT Kanpur shall be scanned and uploaded to the e-Tendering website by the bidder within the period of bid submission.

A part of earnest money (EM) is acceptable in the form of bank guarantee also. In such case, **minimum** 50% of earnest money or Rs. 20 lacs, whichever is less, **shall** have to be deposited in shape prescribed above, and balance **may be deposited** in shape of Bank Guarantee of any scheduled bank **having validity for four months or more from the last date of receipt of bids** which also is to be scanned and uploaded by the intending bidders. The original EMD should be deposited in hardcopy in the office of Executive Engineer along with the mentioned documents.

14. Copy of documents as specified in the tender document shall be scanned and uploaded to the e-Tendering website within the period of bid submission. However, copy (original/self-certified as mentioned in Para 21 below) of all the scanned and uploaded documents as specified in bid document shall have to be submitted by the all bidders, physically in the office of tender opening authority.

15. **Online documents** (Consisting of the enlistment copy, Copy of GST registration etc) submitted by intending bidders shall be opened only of those bidders **who have deposited the Earnest Money in original.**

Online financial bid document submitted by the bidders shall be opened only of those bidders who on the basis of documents uploaded by them within the period of bid submission, qualify in accordance with the provision of the tender conditions (Consisting of the enlistment copy, Copy of GST registration etc). The financial bid shall be opened at the notified time, date & place in presence of eligible bidders or their representative.

The documents (Consisting of the enlistment copy, Copy of GST registration etc) submitted shall be opened at. 11:30 AM on 04.02.2020

The financial bids of the eligible bidders shall be opened at 03:00 PM on 04.02.2020

16. The bid submitted shall become invalid and e-Tender processing fee shall not be refunded if:

(i) The bidder is found ineligible.

(ii) **The bidder does not deposit original EMD to the office of Executive Engineer, IWD, IIT Kanpur.**

(iii) The bidder does not upload all the documents (**including GST registration**) as stipulated in the bid document **including the scan copy of the EMD.**

(iv) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted **physically by the bidder** in the office of bid opening authority.

(v) If a bidder does not quote any percentage above/below on the total amount of the tender or any section/sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

17. Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra cost consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidders implies that he has read this notice and all other contract

documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

18. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
19. The contractor shall not be permitted to bid for works in the IWD responsible for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any officer in the Institute Works Department. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
20. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.
21. **List of Documents to be filled in by the bidders in various forms as indicated in Section III, to be scanned and uploaded within the period of bid submission:**

Table-1

| | |
|---|---|
| 1 | Enlistment Order of the Contractor in appropriate class of Civil building works category. |
| 2 | Demand draft/Pay order or Banker's Cheque/ Deposit at Call Receipt/Fixed Deposit Receipt of a Scheduled Bank/ Bank Guarantee of any Scheduled Bank against EMD (All drawn in favour of the Director, IIT Kanpur) |
| 3 | Certificate of Registration for GST |
| 4 | Photocopy/scan copy of original EMD. |
| 5 | Work experience certificate of similar works. |

SECTION I**BRIEF PARTICULARS OF THE WORK:**

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

| Sl. No. | Name of work | Estimated Cost | Period of completion |
|----------------|---|-------------------------------------|-----------------------------|
| 1 | Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works). | Total Estimated cost =2,43,95,261/- | 06 Months |

2. The work is situated inside IIT Kanpur Campus, Kalyanpur, Kanpur (UP) Pin: 208016.

3. **General features/scope of the work is as under:** The scope covers construction of pre-engineered building (G+1). There are One block to be constructed, The block shall be partially RCC framed structure and balance portion is pre-engineered building. The walls are of AAC blocks and roof is double skin insulated sheet roofing. Foundation and column upto ground floor level shall be of RCC grade M25.

Above details and status are only indicative but not exhaustive. The intending bidder shall inspect the site and fully acquaint with nature and quantum of work and site condition and assess/satisfy himself before quoting and submission of his bid. He is also advised to inspect the indicative drawings attached with this tender document to acquaint with other details about the building.

4. Work shall be executed according to General Conditions of Contract for Central P.W.D. Works with correction slips issued upto as specified in schedule F.

SPECIFIC CONDITIONS FOR THE PRE ENGINEERED BUILDINGS

1. SCOPE OF WORK

The main contractor (successful bidder) shall execute the said Civil work as follows:-

Civil works: It includes C/o Pre Engineered Building using structural steel systems including AAC masonry, finishing, etc.

Any other items which have not been specifically mentioned but are necessary for the construction as per good engineering practice, safety norms and successful operation and guaranteed performance shall be deemed to be included within the scope of the work and shall be provided by the Contractor.

2. PRE ENGINEERED BUILDING USING STRUCTURAL STEEL FRAME WORK

Brief Scope of the work:

In brief the scope of Pre Engineered Building work shall include design, fabrication, supply & erection of Structural steel system, metal roof system, bracing, all accessories etc as specified/required for successful and satisfactory completion of work.

Definition "Pre-engineered steel buildings" are fully fabricated in a controlled environment with the latest technology in the factory after designing, shipped to site in CKD (completely knocked down) condition; and all components are assembled and erected at site with nut-bolts, thereby reducing the time of completion.

Pre-Engineered Steel Buildings use a combination of built-up sections, which provide the basic steel frame work with a choice of single skin sheeting with added insulation or insulated sandwich panels for roofing and wall cladding. The concept is designed to provide a complete building envelope system which is optimum in weight, cost and is also designed to fit user requirement.

3. DESIGN:

The contractor shall carry out the structural analysis and design of the Pre Engineered Steel structure based on the relevant Indian & American codes (both codes inclusive, but in case of differences in the recommendation of the codes, the Indian code shall prevail) using STAAD.pro computer software, preparation of GA drawings, working & shop drawings and the complete design system to be vetted by the Structural designers of IIT/NIT/any Govt. institute. The charges/fees for the same shall be paid by the contractor and will be reimbursed to the contractor on production of proper receipt from the institute. No extra payment towards establishment cost, overhead expenses, etc shall be entertained on this account. It shall be the responsibility of the contractor to get the design/drawing vetted from the Structural designers of IIT/NIT/any Govt.

institute. The vetted drawings shall be submitted, submission of the proof checked/ vetted design details/ drawings, to the engineer in charge for further issue for execution of the work.

The contractor shall get designed the structures and prepare all the required drawings needed for correct and accurate construction. The design shall be strictly in accordance with the latest IS codes, "Design Specifications" and building description.

4. DESIGN SPECIFICATIONS

GENERAL:

The design considerations given hereunder establish the minimum basic requirements for the design. However, structure shall be designed for the satisfactory performance of the functions for which the same is to be constructed.

Structural Framing: All framing members shall be shop fabricated or bolted field assembly, unless otherwise noted on approved drawings or desired by the engineer in charge.

Primary members: Primary structural framing shall refer to the transverse rigid frames, rafters in required shape and Columns canopy rafters, interior columns (beam & column frames), bearing frame rafters and corner columns and end wall wind columns.

Members fabricated from plate or bar stock shall have flanges and webs joined on one side of the web by a continuous welding process. This plate or bar stock shall have minimum yield strength of 350 MPa and will confirm to physical specifications of the latest IS:2062 amended up to last date of receipt of tender.

Secondary members: Secondary structural framing shall refer to Purlins, girts, eave struts, wind bracing, flange bracing, base angles, clips and other miscellaneous structural parts. The members shall have minimum yield strength of 250MPa and will confirm to physical specifications of the latest IS:2062.

Connections: All field connections shall be bolted (unless specified otherwise)

Roof: Roof shall be profile sheet as per the description in the schedule of quantity.

Accessories: As per the scheduled/ required items.

Wall: Wall shall be of AAC blocks of density 650 Kg/Cum and confirming to relevant IS codes

5. LOADING

The structure shall be designed for all loads, including the weight of structure, live load, wind or earthquake. Due consideration shall be given to loading during the construction/erection phase and accounted for in the design. The live load on the first floors shall be taken as 500 Kg/Sqm. The live load on the roofs and at all other locations not specified herein shall confirm to the latest version of IS 875.

Design Codes: Design codes that govern the design procedures and calculations are as follows:-

The members shall be in accordance with the IS codes and the AISC (American Institute of Steel Construction) specifications for the design, fabrication and erection of structural steel.

IS: 875 : Code of practice for design loads of buildings & structures.
IS: 800 : Code of practice for general construction in steel

Whenever any reference to IS/ BIS Code is made, the same shall be taken as the latest revision (with all amendments issued there to) on the last date of submission of tender.

Apart from the IS/BIS Codes mentioned in particular for wind, live and earthquake loads in the various clauses of this specifications, all other relevant codes such as American standards (AISC, MBMA, AISI & AWS specifications) related to the specific job under consideration and / or referred to in the above mentioned codes shall be followed wherever applicable, if the specifications for the same are not available in the relevant BIS codes.

The contractor shall submit the design basis and General Arrangement (G.A) of the structure along with required explanatory sketches/drawings and get the same reviewed by the Engineer in charge and/or his duly nominated authorised representative before starting the final design and approved for Construction (AFC) drawings.

Construction of the structure shall not be taken up at site till all the drawings are reviewed by Engineer in charge and comments/suggestions given by consultants are incorporated.

Engineer in charge reserves the right to review all of the designs and drawings. Review by Engineer in charge shall not relieve the contractor of his responsibility for correct design and execution of the works.

The final design and drawings shall directly adhere to the reviewed design basis and general arrangement and shall incorporate all the comments / suggestions given by Engineer in charge without any implication on time schedule for completion of work.

After the completion of erection and construction, the contractor shall submit to the engineer in charge "As Built" drawings in six numbers of copies.

6. FABRICATION DRAWINGS

Fabrication and erection drawings shall be prepared by the associate agency on the basis of "Approved for Construction (AFC)" design drawings issued to the Contractor. The contractor shall design the structures and prepare all the required "Fabrication and erection drawings" drawings needed for correct and accurate construction. The design shall be strictly in accordance with the latest IS codes, "Design Specifications" and building description. These drawings conforming to IS:

800 shall be prepared by the Associated agency and proof checked/ vetted by the Structural designers of IIT/NIT/any Govt. institute. These drawings shall be thoroughly checked, stamped "Approved for Construction" and signed by the associated agency and main contractor and vetted by the Structural designers of IIT/NIT/any Govt. institute to ensure accuracy and correctness of the drawings.

The Contractor shall not proceed with the fabrication of the structures/members whose fabrication drawings are required to be reviewed before taking up the fabrication work as noted on "Approved for Construction (AFC)" design drawings issued to the Contractor or as conveyed by the Engineer-in-Charge. The fabrication of such structures shall be done only as per the reviewed fabrication drawings.

Fabrication drawings shall be drawn to scale and shall convey the information clearly and adequately. Following information shall be furnished on such drawings:

- Reference to design drawing number (along with revision number) based on which fabrication drawing has been prepared.
- Structural layout, elevations & sections (with distinct erection marking of all members).
- Framing plans, member sizes, orientation and elevations.
- Layout and detailing of rain water pipes and gutters showing all necessary levels, connections and provisions wherever required.
- Detailing of shop/field joints, connections, splices, for required strength and erection. Location, type, size and dimensions of welds and bolts.
- Shapes and sizes of edge preparation for welding.
- Details of shop and field joints/welds.

The Contractor shall additionally ensure accuracy of the following and shall be solely responsible for the same:

- i) Provision for erection and erection clearances.
- ii) Marking of members
- iii) Cut length of members
- iv) Matching of joints and holes.
- v) Provision kept in the members for other interconnected members.

Connections, splices and other details not shown on the design drawings shall be suitably designed and shown on the fabrication drawings based on good engineering practice developing full

member strength. Design calculations for such connections/splices shall be submitted to the Engineer-in-Charge along with the fabrication drawings.

Any substitution or change in section shall be allowed only when prior written approval of the Engineer-in-Charge has been obtained. Fabrication drawings shall be updated incorporating all such substitutions/changes by the Contractor at no extra cost to the Owner.

In case during execution of the work, the Engineer-in-Charge on review of drawings considers any modifications/substitutions necessary to meet the design parameters good engineering practice, these shall be brought to the notice of the Contractor who shall incorporate the same in the drawings and works. The Contractor will be totally responsible for the correctness of the detailed fabrication drawings and execution of the work.

Contractor shall incorporate all the revisions made in the design drawings during the course of execution of work in his fabrication drawings, and resubmit the drawings at no extra cost. All fabrication shall be carried out only as per the latest AFC design drawings and corresponding fabrication drawings.

The Contractor shall supply six prints each of the final/as built drawings along with their transparencies to Engineer-in-Charge for reference and record. The rates quoted shall include for the same.

Bolts and Nuts

High strength bolts shall be used.

Nuts shall be of at least the strength grade appropriate to the grade of bolts or other threaded elements with which they are used.

Washers

All the washers shall conform to relevant IS codes. The brief are as follows:-

Plain washers shall be made of mild steel conforming to IS: 5369 unless noted otherwise. Minimum one washer shall be supplied for each bolt and in case of special types of bolts more than one washer as required for the purpose shall be supplied. Helical spring washer conforming to IS: 6755 shall be provided for bolts carrying dynamic or fluctuating loads and those in direct tension. Tapered washers conforming to IS: 5372 & IS: 5374 shall be used for channels & beams respectively. Washers for high strength friction bolts shall conform to IS: 6649. Washer with relevant grade compatible with grade of bolts/ nuts may be used as per relevant standard.

Welding Consumables

Covered electrodes (for metal arc welding of structural steel) shall conform to IS: 814 & IS: 2062.

Filler rods & wires for gas welding shall conform to IS: 1278.

Base wire electrodes (in submerged arc welding of structural steel) shall conform to IS: 7280. The combination of wire and flux shall comply with the requirements of IS: 3613. Filler rods & base electrodes (for gas shield arc welding of structural steel) shall conform to IS:6419. Welding consumables & procedures shall be such that the mechanical properties of deposited weld metal are not less than the respective minimum values for the parent metal being welded

8. MATERIAL TESTS

The Contractor shall submit manufacturers' quality certificates for all the materials supplied by him. In case, quality certificates are not available or are incomplete or when material quality differs from standard specifications, such materials shall not be used in the construction. The contractor shall arrange carrying out of all tests required under the agreement through the institute laboratory as approved by the Engineer-in-Charge and shall bear all charges in connection therewith including fee for testing. The said cost of tests shall be borne by the contractor/department in the manner indicated below.

- i) By the contractor, if the results show that the test does not conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents
- ii) By the department, if the results conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

The Contractor shall ensure that all materials brought to site are duly approved by the Engineer in-Charge. Rejected materials shall not be used and shall be removed from site forthwith. Any material of doubtful quality for which specific tests are to be carried out as per the instruction of the Engineer-in-Charge shall be separately stacked and properly identified and shall not be used. These shall be removed from site forthwith.

9. FABRICATION

General- Fabrication of structures shall be done strictly as per "Approved for Construction" fabrication drawings and in accordance with IS: 800, IS: 9595 & other relevant BIS Codes and BIS Hand Book SP: 6(1).

Any defective material used in the work shall be replaced by the Contractor at his own expense. Necessary care and precautions shall be taken so as not to cause any damage to the structure during any such removal and replacement.

Any faulty fabrication pointed out at any stage of work by the Engineer-in-Charge, shall be made good or replaced by the Contractor at his own cost.

Tolerances for fabrication of steel structures shall be as per IS: 7215 and other relevant IS codes.

9. FABRICATION PROCEDURE

Holes may be drilled in one operation through two or more separable parts and burrs removed from each part after drilling.

To facilitate grouting, holes shall be provided in column bases or seating plates exceeding 300mm in width for the escape of air.

To avoid accumulation of water in gusseted column bases of laced, battened or box type stanchions, suitable reverse U-type holes shall be provided at the junction of base plate and column section in the vertical gussets for draining out of any water.

10. ASSEMBLY

SPLICING

Prior approval shall be obtained by the Contractor for locations of splices where not shown on design drawings. Only a single splice at approved location shall be allowed for members of length more than 6 mtr.

All slab bases and slab caps shall be accurately machined over the bearing surfaces and shall be in an effective contact with the ends of column sections (shafts).

For gusseted bases and caps, the column shafts shall be ground flush for effective contact with parts connected together.

MARKING FOR IDENTIFICATION

Each component shall be distinctly marked (with paint) before delivery in accordance with the marking diagrams and shall bear such other marks as will facilitate erection.

For small members which are delivered in bundles or crates, the required marking shall be done on small metal tags securely tied to the bundle.

11. SHOP ERECTION

The steel work shall be temporarily shop erected complete or as directed by the Engineer-in-Charge, so that the accuracy of fit may be checked before dispatch.

12. INSPECTION & TESTING OF STRUCTURES

The Engineer-in-Charge (or his authorized representative) shall have free access at all times to those parts of the Contractor's works which are concerned with the fabrication of the steel work and shall be provided with all reasonable facilities for satisfying himself that the fabrication is being undertaken in accordance with the provisions of these specifications & other relevant BIS Codes.

Should any structure or part of a structure be found not to comply with any of the provisions of this specification (or relevant BIS Codes as referred to), it shall be liable to rejection. No structure or part of the structure, once rejected shall be resubmitted for inspection. Defects which may appear during/after fabrication/ erection shall be made good only with the consent of the Engineer-in-Charge and procedure laid down by him.

13. SHOP PAINTING

The steel work shall be appropriately painted with primer and paint as provided in the schedule of quantity. The work shall be in general carried out as per the CPWD specifications specified in schedule F and as provided below and directions of Engineer in charge.

PRIMER APPLICATION

All components and members of steel work shall be given one coat of appropriate primer as provided in the schedule of quantity. Primer coat shall be applied immediately after the surfaces have been properly prepared and cleaned. The primer coat shall be applied over completely dry surfaces (using brushes of good quality) in a manner so as to ensure a continuous and uniform film without "holidaying". Special care shall be taken to cover all the crevices, corners, edges etc. However, in areas which are difficult to reach by brushing, daubers/mops shall be used by dipping the same in paint and then pulling/ pushing them through the narrow spaces. The primer coat shall be air dried.

FINAL PAINT APPLICATION

After the primer is hard dry, the surfaces shall be lightly sand the primer surface with emery paper no. 320 and clean the dust with dry cloth. Apply the paint coats at an interval of 16 – 20 hours. Paint shall be applied by brushing/spraying so that a film free from "holidaying" is obtained.

The colour & shade of first coat of paint shall be slightly lighter than the second coat in order to identify the application of each coat. The second coat of paint shall be applied after the first coat is hard dry. The Contractor shall carry out the painting work in all respects with the best quality of approved materials (conforming to relevant BIS Codes) and workmanship in accordance with the best engineering practice. The Contractor shall furnish characteristics of paints (to be used) indicating the suitability for the required service conditions. The paint manufacturer's instructions supplemented by Engineer-in-Charge's direction if any shall be followed at all times.

- MIXING & THINNING

- Application of paint and the recommended limit on time intervals between consecutive coats.

Painting shall not be done in frost or foggy weather, or when humidity is such as to cause condensation on the surfaces to be painted.

Primers & finish coat paints shall be from the same manufacturer in order to ensure compatibility.

Surfaces which are inaccessible after shop assembly, shall receive the full specified protective treatment before assembly (this shall not apply to the interior of sealed hollow sections).

Steel surfaces shall not be painted within a suitable distance of any edges to be welded if the paint specified would be harmful to welders or impair the quality of the welds.

Welds and adjacent parent metal shall not be painted prior to dislodging, inspection and approval by the Engineer-in-Charge.

Parts to be encased in concrete shall have only one coat of primer and shall not be painted after erection.

14. PACKING

All items shall be suitably packed in case these are to be dispatched from the fabrication shop to the actual site of erection so as to protect them from any damage/distortion or falling during transit. Where necessary, slender projecting parts shall be temporarily braced to avoid warping during transportation.

Small parts such as gussets, cleats etc., shall be securely wired on to their respective main members.

Bolts, nuts washers etc. shall be packed in crates.

15. TRANSPORTATION

Loading and transportation shall be done in compliance with transportation rules. In case, certain parts cannot be transported in the lengths stipulated on the drawings, the position details of such additional splice joints shall be got approved by the Engineer- in- Charge.

16. SITE (FIELD) ERECTION

Plant & Equipment- The suitability and capacity of all plant and equipment used shall be to the complete satisfaction of the Engineer-in-Charge.

17. STORING & HANDLING

All steel work shall be so stored and handled at site so that the members are not subjected to excessive stresses and any damage.

18. SETTING OUT

One set of reference axes and one bench mark level shall be furnished to the Contractor. These shall be used for setting out of structures. The Contractor shall assume complete responsibility for correct setting out of all steelwork, erecting it correctly as per alignment / levels shown in the drawings and plumb (verticality) of vertical members.

19. SAFETY & SECURITY DURING ERECTION

The contractor shall comply with relevant IS codes for necessary safety and adhere to safe erection practices and guard against hazardous as well as unsafe working conditions during all stages of erection.

During erection, the steel work shall be securely bolted or otherwise fastened and when necessary, temporarily braced/guyed to provide for all loads to be carried by the structure during erection till the completion, including those due to the wind, erection equipment & its operation etc.

No permanent bolting or welding shall be done until proper alignment has been achieved. Proper access, platform and safety arrangement shall be provided for working and inspection, (at no extra cost to the owner) whenever required.

20. FIELD CONNECTIONS

Field Bolting- Field bolting shall be carried out with the same care as required for shop bolting.

Field Welding- All field assembly and welding shall be executed in accordance with the requirements for shop assembly and welding. Holes made for all erection bolts- where removed after final erection shall be plugged by welding. Alternatively erection bolts may be left and secured.

21. SCHEME AND SEQUENCE OF ERECTION

The Contractor shall furnish the detailed scheme and sequence of erection to match with the project schedule and get the same approved by the Engineer-in-Charge. All necessary coordination and synchronization shall be done with the main contractor so as to match with the project schedule.

Conditions related to site restrictions and/or site facilities available for the work:-

1. The contractor shall have to make his own arrangement of water. The withdrawal of water from the network of the Institute shall not be allowed. No charges shall be recovered if the contractor develops tube well at site and pumping arrangement at his own cost. The contractor shall have to seek permission of digging tube well etc. for water arrangements from Engineer-in-charge.
2. Temporary electrical connection (single / three phase) shall be provided by the Institute from its distribution network and the charges shall be realized at the prevalent commercial tariff of the institute, presently recovery rate is Rs. 9.19 per unit on the basis of actual consumption thro' a separate sub-meter under the control of the Engineer-in-charge. If the rates are revised in future the same shall be applicable to the contractor. The contractor at his own cost shall arrange the cable for service connection and the sub meter.
3. Justified quantum of space within the site location, free of cost, may be provided for the infrastructure facilities like batching plant, material stock yard, site office etc. However, labour hutments shall not be allowed inside the campus.
4. Under normal circumstances, the working hours for labour are 09:00 AM to 06:00 PM. For working beyond 06:00 PM or prior to 08:00 AM, the contractor has to apply to the security personals alongwith the name of labours. Permission may be granted for the extended hours.
5. The barricading shall be provided at all necessary locations as per general safety norms requirements of the site.

SECTION II

INFORMATION & INSTRUCTIONS FOR BIDDERS

1.0 General:

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

1.2 The bid should be type-written /computer printed. The tenderer (s) should sign each page of the application.

1.3 Overwriting should be avoided. Correction, if any, should be made by neatly crossing out, initialing, dating and rewriting.

2.0 Final decision making authority.

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

3.0 Particulars provisional

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

4.0 Site visit

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

4.1 The bidder should have sufficient number of Technical & Administrative employees for proper execution of the contract. The bidder shall have to submit a list of these employees stating clearly how these would be involved in this work within 15 days of award of work.

5.0 Opening of Price bid

After scrutiny of the eligibility Documents (Consisting of appropriate enlistment order, registration with GST, Experience of similar work, etc), a list of short listed agencies will be prepared. Thereafter the financial bids of only the qualified and acceptable bidders shall be opened at the notified time, date and place in the presence of the qualified bidders or their representatives, if present. The bid shall remain valid for **90 days from date of submission of bid.**

6.0 Award criteria

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

(a) Amend the scope and value of contract to the bidder.

(b) Reject any or all the applications without assigning any reason.

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

SECTION-B

-----Deleted-----

PART-A

CPWD-6 For e-Tendering

1. The Superintending Engineer, IIT Kanpur invites on behalf of Board of Governors online percentage rate bids from enlisted contractors (**CPWD, BSNL, MES, UPPWD & Central PSUs**) of appropriate class in the Civil Building works category for the civil work of “Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works).”
 - 1.1 The work is estimated to cost Rs. 2,43,95,261.00 This estimate, however, is given merely as a rough guide.
 - 1.2 Contractor who fulfill the following requirement shall be eligible to apply. **Joint ventures are not accepted.**
 - (a) **Should be a CPWD, BSNL, MES, UPPWD & Central PSUs enlisted contractor of appropriate class in Civil of Building works category.**
2. Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD 7 which is available as a Govt. of India Publication and also available on website www.tenderhome.com, <https://eprocure.gov.in/eprocure/app> and www.iitk.ac.in/iwd/tenderhall.htm. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
3. The time allowed for carrying out the work will be **06 Months** from the date of start as defined in schedule 'F'.
4.
 - i) The site for the work is available.
 - ii) The architectural and structural drawings shall be made available in phased manner, as per requirement of the same as per approved programme of completion submitted by the contractor after award of work.
5. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website <https://eprocure.gov.in/eprocure/app>, www.tenderhome.com and www.iitk.ac.in/iwd/tenderhall.htm in free of cost.
6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

8. a) i) Earnest Money in the form of Demand Draft or Pay order or Banker's Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of the Director IIT Kanpur") shall be scanned and uploaded to the e-Tendering website by the bidder within the period of bid submission. A part of earnest money (EM) is acceptable in the form of bank guarantee also. This bank guarantee shall also be in favour of the the Director IIT Kanpur. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any scheduled bank **having validity for four months or more from the last date of submission of bids** which also is to be scanned and uploaded by the intending bidders. The bank guarantee shall also be in favour of the Director IIT Kanpur. The original EMD should be deposited in the office of Executive Engineer, IWD IIT Kanpur, within the period of bid submission.
- b) Copy of documents as specified in the tender document shall be scanned and uploaded to the e-Tendering website within the period of bid submission.

However, copy (original/self-certified as mentioned in para 21of tender document on page No. 8) of all the scanned and uploaded documents as specified in bid document shall have to be submitted by the all bidders within last date of submission of bid, physically in the office of tender opening authority.

- **Online qualification bid documents, submitted by intending bidders shall be opened only of those bidders who have submitted the original Earnest Money.**
- **Online financial bid document submitted by the bidders shall be opened only of those bidders who are found eligible on the basis of documents uploaded by them within the period of bid submission. The financial bid shall be opened at the notified time, date & place in presence of eligible bidders or their representative.**

The documents submitted shall be opened at 11:30 AM on 04/02/2020

The financial bids shall be opened at 03:30 PM on 04/02/2020

9. The bid submitted shall become invalid and e-Tender processing fee shall not be refunded if:
- (i) The bidder is found ineligible.
 - (ii) The bidder does not deposit original EMD with the office of the Executive Engineer, IWD IIT Kanpur.
 - (iii) The bidder does not upload all the documents (including GST registration) as stipulated in the bid document.

- (iv) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the bidder in the office of bid opening authority.
- (v) If a bidder quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section/sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
10. The contractor whose bid is accepted will be required to furnish performance guarantee of 5% (Five Percent) of the bid amount within the period specified in Schedule F. This guarantee shall be in the form of Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. **The contractor whose bid is accepted will be also be required to furnish either copy of applicable licenses/registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. if applicable and also ensure the compliance of aforesaid provisions by the sub contractors, if any engaged by the contractor for the said work and Programme Chart (Time and Progress) within the period specified in Schedule F.**
11. Description of the work is as follows: "Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works)."

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be

- issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.
12. The competent authority on behalf of the IIT Kanpur does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
 13. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
 14. The competent authority on behalf of IIT Kanpur reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
 15. The contractor shall not be permitted to bid for works in the IWD responsible for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any officer in the Institute Works Department. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
 16. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.
 17. The bid for the works shall remain open for acceptance for a period of ninety (90) days from the date of submission of the bids. If any bidder withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the bidders shall not be allowed to participate in the rebidding process of the work.

18. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
- (a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - (b) Standard **C.P.W.D. Form 7** or other Standard C.P.W.D. Form as applicable.

CPWD –7

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR
INSTITUTE WORKS DEPARTMENT
CENTRAL OFFICE
Percentage Rate Tender & Contract for Works**

- (A) Tender for the work of : Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works).
- (i) Last date for online submission of e-tenders is upto 05:00 PM on 01/02/2020.
- (ii) Documents bids to be opened in presence of tenderers who may be present on 11.30 AM on 04/02/2020 in the office of the Executive Engineer, IWD, IIT Kanpur.
- (iii) Financial bids of the eligible bidders shall be opened in presence of tenderers who may be present on 03:00 PM on 04/02/2020 in the office of the Executive Engineer, IWD, IIT Kanpur.

TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, particular specification, Schedule of Rates & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the Board of Governors, IIT Kanpur within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for ninety (90) days from the due date of its Eligibility bid opening and not make any modification in its terms and conditions.

A sum of Rs **4,87,905.00/-** is hereby forwarded in deposit at call receipt of a scheduled bank/fixed deposit receipt of scheduled bank/demand draft of a scheduled bank/bank guarantee issued by a scheduled bank as earnest money. If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said the Board of Governors, IIT Kanpur or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/We agree that the Board of Governors, IIT Kanpur or the successors in office shall without prejudice to any

other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form. Further, I/We agree that in case of forfeiture of Earnest Money & Performance Guarantee as aforesaid. I/We shall be debarred for participation in the re-tendering process of the work.

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

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

Dated:

Signature of Contractor

Witness:

Postal Address

Address:

Occupation:

ACCEPTANCE

The above tender (as modified by you / as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the Board of Governors, IIT Kanpur for a sum of Rs..... (Rupees
.....
.....
.....)

The letters referred to below shall form part of this contract agreement:-

- (a)
- (b)
- (c)

For & on behalf of Board of
Governors, IIT Kanpur

Signature.....

Dated:

Designation

PROFORMA OF SCHEDULES**SCHEDULE 'A'**

Schedule of quantities : Enclosed in page No. 114-153

SCHEDULE 'B'

Schedule of materials to be issued to the contractor:

| No. | Description of item | Quantity | Unit | Rates at which the material will be charged to the contractor | Place of issue |
|-----|---------------------|----------|------|---|----------------|
| 1 | 2 | 3 | | 4 | 5 |
| NIL | | | | | |

SCHEDULE 'C'

Tools and plants to be hired to the contractor

| S.No. | Description | Hire charges per day | Place of issue |
|-------|-------------|----------------------|----------------|
| Nil | | | |

SCHEDULE 'D'

| | |
|---|-----|
| Extra schedule for specific requirements/document for the work, if any: | NIL |
|---|-----|

SCHEDULE 'E'

| | |
|--|---|
| Reference to General Conditions of contract: | GCC 2014, CPWD Form 7 modified and corrected up to 31.12.2019 |
| Name of Work: | Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works). |
| (I) Estimated cost of work | Total Estimated cost=2,43,95,261.00 |
| (II) Earnest Money | Rs. 4,87,905.00 /- |

| | |
|----------------------------|----------------------|
| (ii) Performance Guarantee | 5% of tendered value |
| (iii) Security Deposit | 5% of tendered value |

SCHEDULE ' F '**GENERAL RULES & DIRECTIONS:**

| | |
|---|--|
| Officer Inviting tender | Superintending Engineer, IWD IIT Kanpur |
| Definitions: | |
| Engineer-in-Charge | Executive Engineer, IWD, IIT Kanpur |
| Accepting Authority | Superintending Engineer, IWD IIT Kanpur |
| Percentage on cost of materials and Labour to cover all overheads and profits | 15% |
| 2(xi) Standard Schedule of Rates | Delhi Schedule of Rates 2018. |
| (xii) Department | Institute Works Department |
| 3(i) Standard CPWD Contract Form | GCC 2014, CPWD Form 7 modified and corrected up to 31.12.2019 The following condition pertains to GST of Clause 37 & 38 of General Condition of contracts and corresponding amendments should be read as follows:- a) The quoted rates should be exclusive of GST. b) The GST as applicable shall be paid extra |
| Clause 1 | |
| (i) Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance | 15 (Fifteen) days |
| (ii) Maximum allowable extension with late fee @ 0.1% of Performance Guarantee amount per day beyond the Period provided in (i) above | 7 days |
| Clause 2: Authority for fixing compensation under clause 2 | Superintending Engineer, IWD IIT Kanpur, Kanpur |

| | |
|--|----------------------|
| Clause 2A Whether Clause 2A shall be applicable | Not Applicable |
| Clause 5 Number of days from the date of issue of letter of acceptance for reckoning date of start | 22 (Twenty Two) days |

| | |
|--|---|
| Time allowed for execution of work | 06 Months |
| Authority to decide: | |
| (i) Extension of time | Superintending Engineer, IWD IIT Kanpur |
| (ii) Rescheduling of milestones | Superintending Engineer, IWD IIT Kanpur |
| (iii) Shifting of date of start in case of delay in handing over of site | Superintending Engineer, IWD IIT Kanpur |

| | |
|---|---|
| Clause 6, 6A | |
| Clause applicable - (6 or 6A) | Clause 6A |
| Clause 7 | |
| Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment | Rs.40.00 Lakhs (Rupees FOURTY Lakhs only) or as mutually agreed by both the parties |
| Clause 7A: Whether Clause 7A shall be applicable (No Running Account bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-Charge.) | Yes |
| Clause 10A List of testing equipment to be provided by the contractor at site lab. | As per Annexure 1 |
| Clause 10B (ii) & Clause 10B(iii) Whether Clause 10 B (ii) shall be applicable | Yes |
| Whether clause 10-B (iii) shall be applicable | No |
| Clause 10C | NOT APPLICABLE |

Clause 10CA

| Sl. No | Material covered under this clause | Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed | Base Price excluding GST of all Materials, covered under clause 10 CA for October 2019 |
|--------|------------------------------------|---|--|
| 1 | Portland Pozzolana | NA | Rs 4,531/ MT |

| | | | |
|-----|--|----|---------------|
| | Cement (PPC) | | |
| 2 | Steel for Reinforcement TMT Fe 500D | | |
| 2.1 | Primary Manufacturer | NA | Rs 38,500/ MT |
| 3. | Structural Steel | NA | Rs 36,500/ MT |

| | |
|--|--|
| Clause 10CC Clause 10 CC to be applicable in contracts where the stipulated Period of completion exceeding the period shown in next column : | More than 12 months. (Hence Clause 10CC is not applicable) |
| Schedule of component of other Materials, Labour, POL etc. for price escalation. | |
| Component of civil (except materials covered Under clause 10CA) /Electrical construction value of work - expressed as percent of total value of work. | NA |
| Component of Labour –expressed as percent of total value of work. | NA |
| Component of P.O.L. -expressed as percent of total value of work. | NA |
| Clause 11 Specifications to be followed for execution of work | C.P.W.D Specification 2009 Vol. I & II, with correction Slips issued up to the last date of submission of tender |
| Clause 12: Type of work | Original work |
| 12.2. & 12.3 Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building work | 30% |
| 12.5 (i) Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (Except Earth Work) | 30% |
| (ii) Deviation Limit for items in earth work Sub head of DSR and or related items. | 100% |
| Clause 16 Competent Authority for deciding reduced rates: } | Superintending Engineer, IWD IIT Kanpur |
| Clause 18 List of mandatory machinery, tools & plants to be deployed by the contractor at site:- | As per Annexure 2 |

Clause 36 (i) Requirement of Technical Representative(s) and recovery Rate

| Sl | Requirement of Technical staff (of major + minor | Minimum experience in | Designation | Rate at which recovery shall be made from the contractor in the |
|----|--|-----------------------|-------------|---|
|----|--|-----------------------|-------------|---|

| No. | component) | | Year | | event of not fulfilling provision of clause 36(i) | |
|-----|---|--------|--------------------------------|---|---|---|
| | Qualification | Number | | | Figures | Words |
| | (of Major + Minor component) | | | | | |
| 1 | Graduate Engineer Or Diploma Engineer | 1 | 02 or 05 respectively | Project planning/ Site/ quality/ billing Engineer | Rs.25000/- pm Per person | Rupees TWENTY FIVE Thousand only per month per person |

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

Clause 42

| | | | |
|------|-----|--|--|
| (i) | (a) | Schedule/statement for determining theoretical quantity of cement, bitumen etc on the basis of Delhi Schedule of Rates | Delhi Schedule of Rates 2018 |
| (ii) | | Variations permissible on theoretical quantities: | |
| | (a) | Cement | ±(plus/minus) 2% (Two percent) |
| | (b) | Bitumen for all works | + (plus) 2.5% (Two point five percent) only and nil on – (minus) side. |
| | (c) | Steel Reinforcement and structural steel sections for each diameter, section and category | + (plus) 2.0% (Two percent) only and nil on – (minus) side. |
| | (d) | Paint | As per co-efficient of standard Delhi Analysis of Rate 2016. |
| | (e) | Any other item | As per manufacturer specification |

| |
|---|
| RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION (FOR MATERIALS UNDER CLAUSE 10 C A) |
|---|

| S No | Description of Item | Rates in figures and words at which recovery shall be made from the Contractor | |
|---------|--|--|---|
| | | Excess beyond permissible variation | Less use beyond permissible variation |
| 1. | Portland Pozzolana Cement (PPC) | Nil | Rs 4984/- per MT |
| 2. | Steel Reinforcement TMT Bar of all diameters | Nil | Rs 42350/-per MT |

ANNEXURE-1**LIST OF TESTING EQUIPMENTS TO BE PROVIDED BY THE CONTRACTOR AT
SITE LAB**

1. Balances
 - a. 7 Kg to 10 kg capacity, semi-self indicating type- Accuracy 10 gm
 - b. 500 gm capacities, semi-self indicating type- Accuracy 1 gm
 - c. Pan balance- 5kg capacity- Accuracy 10 gms
2. Ovens- electronically operated, thermostatically controlled upto 110°C to 1°C.
3. Sieves as per IS 460-1962.
 - i. IS sieves - 450mm internal dia, of sizes 100mm, 80mm, 63mm, 50mm, 40mm, 25mm, 12.5mm, 10mm, 6.3mm and 4.75mm complete with lid and pan.
 - ii. IS sieves - 200mm internal dia(brass frame), consisting of 2.36mm, 1.18mm, 600 microns, 425 microns, 212 microns, 90 microns, 75 microns with lid and pan.
4. Sieve shaker capable of 200mm and 300 mm dia sieves, manually operated with timing switch assembly.
5. Equipment for slump test-slump cone, steel plate, tamping rod, steel scale, scoop.
6. Dial gauges, 25mm travel- 0.01mm/division least count-2 nos.
7. 100 tonnes compression testing machine, electrical cum manually operated along with one hundred cube moulds of 15x15x15 cm size.
8. Ultrasonic Pulse Velocity Test Equipment (For concrete) - 1 No.
9. Graduated measuring cylinders 200 ml capacity – 3 Nos.
10. Enamel trays (for efflorescence test of bricks)
 - i. 300 mm x 250 mm x 40 mm – 2 Nos.
 - ii. Circular plates of 250mm dia 4 Nos.
11. Steel tapes-3m and 10m, hammer 100 gms.
12. Vernier calipers
13. Micrometer screw 25mm gauge.
14. A good quality plumb bob.
15. Spirit level, minimum 30cms long with 3 bubbles for horizontal vertical.
16. Wire gauge (circular type) disc.
17. Foot rule
18. Long Nylon thread
19. Rebound hammer for testing concrete
20. Magnifying glass.
21. Screw driver 30cms long
22. Ball pin hammer, 100 gms
23. Plastic bags for taking samples.
24. Earth resistance tests
25. Megger
26. Compaction Apparatus (Proctor) as per IS 2720-Part VII-1974
27. Modified ASHO compaction Apparatus as per IS 2720-Part III-1974
28. Sand pouring cylinder with control pouring and tube complete as per IS 2720-Part XXVIII-1974

ANNEXURE – 2

List of machinery, Tools and plants to be deployed by the contractor at site:

| S. No | Activity | Name of equipment | Number |
|-------|--|---|-----------|
| 1 | Earth work | Earth moving equipment like JCB 3D | 1Nos |
| 2 | Concrete work | a) semi automatic concrete batching plant (this is optional as per tender conditions) | 1 No |
| | | b) Transit Mixer for concrete | 1 No |
| | | c) Plate vibrator, screed leveller | 4 Nos |
| | | d) Needle vibrator | 4 Nos |
| | | e) Concrete pump | 1 Nos |
| 3 | Building work | a) Bar cutting machine | 1 Nos |
| | | b) Bar bending machine | 1 Nos |
| | | c) Welding machine | 2 Nos |
| | | d) Cube testing machine | 1 Nos |
| | | e) Steel shuttering plates | 500 sqm |
| | | f) Steel scaffolding Adjustable telescopic props. | 1000 Nos |
| | | Adjustable spans | 300 Nos |
| | | g) Grinding / polishing machines | 2 Nos |
| | | h)DG set (200 KVA and 100KVA) | 1 No each |
| | | I)Power driven earth rammer (Soil compactor) | 1 Nos |
| | | j)Tractor with trolley | 1 Nos |
| | | k)Water tanker (minimum capacity 1500 ltrs) | 1 Nos |
| | | l)Welding machine | 2 Nos |
| 4 | Transportation | Truck & Tippers | 1 nos |
| 5 | Dewatering | Diesel and electrical pumps | 1 Nos |
| 6 | Survey | Electronic Total station instrument | 1 No |
| | Any other machinery required for completion of the work as per actual site requirement | | |

Contractor is advised to deploy the required Plant and machinery on the project. The number of plant and machinery to be deployed by him is indicated. In case the contractor fails to deploy the plant and machinery whenever required and as per the direction of the Engineer-in-charge, he (Engineer-in-charge) shall be at a liberty to get the same deployed at the risk and cost of the contractor.

INTEGRITY PACT

To,

.....,
.....,
.....,

Sub : NIT No. .../C/D1/2019-20 for the work of “Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works).”

Dear Sir,

It is here by declared that IWD, IIT Kanpur is committed to follow the principle of transparency, equity and competitiveness in Public procurement.

The Subject Notice Inviting Tender (NIT) in an invitation to offer made on the condition that the Tenderer will sign the integrity Agreement, which is an integral part of tender/tender documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the tender of the tenderer would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the IWD, IIT Kanpur.

Your faithfully

Executive Engineer

INTEGRITY PACT

To,

Superintending Engineer,
IWD, IIT KANPUR

Sub: Submission of Tender for the work of (NIT No. .../C/D1/2019-20) “Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works).”

Dear Sir,

I/We acknowledge that IWD, IIT Kanpur is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/tender document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE TENDER SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/tender is finally accepted by IWD, IIT Kanpur. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/tender, IWD, IIT Kanpur shall have unqualified, absolute and unfettered right to disqualify the tenderer/tenderer and reject the tender/tender in accordance with terms and conditions of the tender/tender.

Yours faithfully

(Duly authorized signatory of the Tenderer)

To be signed by the tenderer and same signatory competent / authorized to sign the relevant contract on behalf of IIT Kanpur

INTEGRITY AGREEMENT

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

BETWEEN

Board of Governors, IIT Kanpur represented through Superintending Engineer, IWD, IIT Kanpur, (Hereinafter referred as the (Address of Division) 'Principal/Owner', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

..... (Name and Address of the Individual/firm/Company) through (Hereinafter referred to as the (Details of duly authorized signatory) "Tenderer/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal /Owner has floated the Tender (NIT No.....) (hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for " Construction of additional pre-engineered steel structures (G+1) Near Media Lab Building at IIT Kanpur (SH: Civil works)". Here in after referred to as the "Contract".

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

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

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

Article 1: Commitment of the Principal/Owner

1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

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

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

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

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

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

2) The Tenderer(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution: a) The Tenderer(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.

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

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

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

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

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

4) The Tenderer(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining

unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.

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

Article 3: Consequences of Breach

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

1) If the Tenderer(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Tenderer(s)/ Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Tenderer/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.

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

3) Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a Tenderer(s) or Contractor(s), or of an employee or a representative or an associate of a Tenderer (s) or Contractor(s) which constitutes corruption within the meaning of Indian Penal code (IPC)/Prevention of Corruption Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1) The Tenderer declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.

2) If the Tenderer(s) makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Tenderer(s)/Contractor(s) as deemed fit by the Principal/ Owner.

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

Article 5: Equal Treatment of all Tenderer(s)/Contractor(s)/Subcontractors

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

2) The Principal/Owner will enter into Pacts on identical terms as this one with all Tenderers and Contractors.

3) The Principal/Owner will disqualify Tenderer(s), who do not submit, the duly signed Pact between the Principal/Owner and the tenderer(s), along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6- Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other tenderer(s), till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, of IIT Kanpur.

Article 7- Other Provisions

1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Head quarters of the Division of the Principal/Owner, who has floated the Tender.

2) Changes and supplements need to be made in writing. Side agreements have not been made.

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

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

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

Article 8- LEGAL AND PRIOR RIGHTS

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

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place

and date first above mentioned in the presence of following witnesses:

..... (For and on behalf of Principal/Owner)

..... (For and on behalf of Tenderer(s)/Contractor(s))

WITNESSES:

1. (signature, name and address)

2. (signature, name and address)

Place:

Dated :

MATERIAL AND QUALITY ASSURANCE

1. The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted. He shall have to submit quality assurance programme within two weeks of the award of work. The quality assurance programme should include method statement for various items of work to be executed along with check lists to enforce quality control.
2. The contractor shall get the source of all materials, approved from the Engineer-in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/make of various materials not specified in the agreement, to be used for the approval of the Engineer-in-Charge along with samples and once the sample is approved, he shall adhere to the approved sample.
3. The contractor shall submit shop drawings of staging and shuttering arrangement, aluminum work, and other works as desired by Engineer In Charge for his approval before execution. The contractor shall also submit bar bending schedule for approval of Engineer –in – charge before execution.

4. **Test Laboratories :**

A) Laboratory at site :

The contractor shall establish a testing lab at site and provide testing equipment and materials for the field tests mentioned in the list of mandatory tests given in CPWD specifications. Nothing extra shall be payable to him on this account.

The representatives of the department shall be at liberty to inspect the testing facilities at site and conduct testing at random in consultation with Engineer in charge. The contractor shall provide all necessary facilities for the purpose. The laboratory shall be equipped, inter alia, with the necessary equipments.

The contractor shall arrange carrying out of all tests required under the agreement through the institute laboratory as approved by the Engineer-in-Charge and shall bear all charges in connection therewith including fee for testing. The said cost of tests shall be borne by the contractor/department in the manner indicated below.

- i) By the contractor, if the results show that the test does not conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents
- ii) By the department, if the results conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

If the tests which were to be conducted in the site laboratory are conducted in other laboratories for any reasons attributable to contractor the cost of such tests shall be borne by the contractor.

B) Other Laboratories :

- B1 Materials having manufacturer's test report/certificate can be sent for testing to any external laboratories by the engineer in charge for ascertaining the quality of products. The contractor shall provide free of charge all the materials required for such testing, including transportation and other logistical support. Unless specifically specified otherwise, the testing charge for such materials having manufacturer's test report shall be borne by the engineer in charge if the test passes and shall be borne by the contractor if the test fails.
- B2 For other materials, not covered in S. No "B1" above, the contractor shall bear the testing charges if tests are carried out at external laboratories due to non availability of necessary T&P in the site laboratories except where specifically specified otherwise elsewhere in this document.
- B3 For all testing, the contractor shall supply free of charge (except if specifically provided otherwise in the document elsewhere) all the sample materials required for testing, necessary facilities ,manpower, including transportation to required labs, all necessary follow up, report collection from lab to its submission to Engineer in charge. Nothing shall be payable on above account.

C) Sampling of Materials :

- (i) Sample of building materials fittings and other articles required for execution of work shall be got approved from the Engineer-in-Charge. Articles manufactured by companies of repute and approved by the Engineer-in-Charge shall only be used. Articles bearing BIS certification mark shall be used. In case the above are not available, the quality of samples brought by the contractor shall be judged by standards laid down in the relevant specifications. All materials and articles 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.
- (ii) The contractor shall ensure quality construction in a planned and time bound manner.
- (iii) BIS marked materials except otherwise specified shall be subjected to quality test at the discretion of the Engineer-in-Charge besides testing of other materials as per the specifications described for the item/materials. Wherever BIS marked materials are brought to the site of work, the contractor shall if required, by the Engineer-in-Charge furnish manufacturers test certificate to establish that the material produced by the contractor for incorporation in the work satisfies the provisions of BIS codes relevant to the material and/or the work done.
- (iv) The contractor shall procure all the materials in advance so that there is sufficient time to testing and approving of the materials and clearance of the same before use in work.

- (v) All materials brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.
 - (vi) The contractor shall be fully responsible for the safe custody of the materials issued to him even if the materials are in double lock and key system.
 - (vii) The Stone aggregate/stone, sand shall be brought from any quarries subjected to the said materials confirm CPWD specifications.
- 5 The day to day receipt and issue accounts of different grade/brand of cement shall be maintained separately in the standard proforma decided by the Engineer-in-Charge or his authorised representative of work and which shall be duly signed by the contractor or his authorised representative.
- 6 The contractor shall be fully responsible for the safe custody of materials brought by him issued to him even though the materials are under double lock key system.
- 7 Separate cement registers showing the receipt of the OPC and PPC shall be maintained at site. The contractor shall construct separate godowns for storage of OPC & PPC at site and nothing extra on this account shall be payable.
- 8 Cement issued shall be for consumption at site only. No cement for factory made items and those not manufactured at site shall be issued.
- 9 In case there is any discrepancy in frequency of testing as given in the list of mandatory test and that in the individual sub-head of work as per CPWD specifications, the higher of the two frequencies of testing shall be adopted.
- 11 Maintenance of Registers:**
- (i) All the registers for tests of material to be carried out at construction site or in outside laboratories shall be maintained by the contractor. These register shall be issued to the contractor by Engineer-in-Charge.
 - (ii) The test registers to be issued to the contractor are :
 - a) Materials at site account register.
 - b) Cement register.
 - c) Master test registers.
 - d) Cube test register.
 - e) Any other test register as required.

- (iii) All the entries in the register will be made by the designated engineering staff of the contractor and same should be regularly reviewed by engineer in charge and/or his authorized representatives.
- (iv) Contractor shall be responsible for safe custody of all the registers.
- (v) Submission of copy of all test registers, material at site register along with each running account bill and final bill shall be mandatory. The contractor shall submit all these registers alongwith the final bill to the Engineer-in-charge.

General Terms and Conditions:

- 1 A. The order of preference in case of any discrepancy may be read as the following:
- i) Nomenclature of items as per schedule of quantities.
 - ii) Particular specification and special condition, if any.
 - iii) CPWD specifications.
 - iv) Indian standard specifications of B.I.S.
 - v) International codes for sound engineering practices.
 - vi) Drawings for the work
 - vii) Sound Engineering Practice

A reference made to any Indian Standard specification in these documents, shall imply to be the latest version of that standard including such revision/amendments as are issued by the bureau of Indian standard upto last date as specified in schedule-F for the amendment dates applicable to CPWD specifications. The contractor shall keep at his own cost all such publications of relevant Indian standard applicable to the work at site all time.

- B. In case of discrepancy between the tender conditions detailed in this document and the applicable General Conditions of Contract, the tender conditions mentioned in this tender document shall prevail.
- 2 Except for the items, for which particular specifications are given in this tender document or where it is specifically mentioned otherwise in the description of items in the schedule of quantities, the work shall generally be carried out in accordance with the “CPWD specifications 2009 Vol. 1 and Vol. 2 (with corrections slips issued upto the date as specified in schedule-F for the amendment dates applicable to GCC/CPWD-Specifications/etc). (Hereinafter to be referred to as CPWD specifications) and instructions of Engineer-in-Charge. Wherever CPWD specifications are silent the latest IS codes/specification shall be followed.
- 3 Existing roads of campus may be used for transport purpose, upto the point where the same is available and allowed with the specific permission of IIT Kanpur authorities in the interest of work. However, restrictions on the existing roads of campus may be imposed by the security personals regarding route available, speed, honking, ply timing etc which shall be strictly observed. Also no claim whatsoever shall be made on this account by the contractor.
- 4 On account of security considerations, there could be some restrictions on the working hours, movement of vehicles for transportation of materials movement of labour and

- location of labour camp. The contractor shall be bound to follow all such restrictions/instructions and adjust the programme for execution of work accordingly and nothing extra shall be payable on account of the same. The contractor has to obtain pass/identity card for his each labour/personal for entry in the campus from the IIT authorities. The labours will not be allowed to stay in the campus during night time. They will also have restricted movement inside the campus and should not move to locations inside the campus which do not concern this contract. The contractor shall be fully responsible for any unlawful act, misbehavior done by its labour and staff at IIT campus. The contractor shall issue Identity card to all labourers and engineers/staff engaged by him and nothing shall be paid on this account.
- 5 The contractor (s) shall give to the Municipality, Police and other authorities all necessary notices etc. that may be required by law and obtain all requisite Licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be leviable on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain light and other illumination on for cautioning the public at night.
 - 6 The contractor shall fully comply with all legal orders and directions of the Public or local authorities, municipality, IIT authorities and adhere by their rules and regulations and pay all fees and charges for which he may be liable in this regard. Nothing extra shall be paid/reimbursed for the same.
 - 7 It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.
 - 8 The contractor shall maintain in perfect condition, all portions executed till completion of the entire work allotted to him. Where however phased delivery of work is contemplated these provisions shall apply separately to each phase.
 - 9 The contractor shall submit the list of engineers / technical staff with charter of duties / responsibilities of each one related to execution of the work.
 - 10 PROGRAMME CHART: The contractor shall prepare an integrated programme chart for the execution of work and the detailed provision in clause 5 of GCC shall be followed.
 - 11 Defects Liability Period (DLP)
 - 11.1 Defects liability period shall be taken as **thirty six (36) months** from the date of completion of the work for building as a whole, wherein all the defects shall be rectified by the contractor at his own cost.
 - 11.2 Defects of serious nature causing inconvenience such as leakage, reverse floor slopes affecting the drainage (ponding of water), warping and opening of joints in doors and window shutters etc shall be undertaken by the contractor immediately on receipt of the complaint but not exceeding one week time, failing which the defects will be got removed at his risk and cost plus 25% as supervision and establishment charges.
 - 11.3 All other defects notified to the contractor during the DLP shall be rectified to the entire satisfaction of Engineer-in-Charge or item replaced as soon as possible but not later than one month in any case. Failure to do so in a reasonable period the Engineer-in-Charge shall get it done at his cost plus 25% as supervision and establishment charges after final notice

of 10 days. The decision of Engineer-in-Charge regarding a defect being of serious nature or otherwise shall be final and binding.

11.4 The scope of the defect liability will be as under:

| S.No | Description | Defect Liability |
|-------|-----------------------|---|
| (i) | Concrete work | (a) Rectification of structural /superficial/non-structural cracks. (b) Rectification of dampness/leakages/seepage in roof slab/junctions & sunken portion, depressed portion, through RCC slab, vertical ties, bands, walls, base slab, junction of RCC walls with base slab and construction joints of RCC water tanks. (c) Rectification of cracks in girders, beam, slab, column, lintels, vertical ties, plinth bands, lintel bands etc. |
| (ii) | Brick work / AAC work | (a) Rectification of cracks in confined masonry panel wall/partition wall in full length or in part portion. (b) Cracks / settlement of main wall, partition wall or dwarf walls. (c) Rectification of efflorescence, dampness. |
| (iii) | Woodwork & Joinery | (a) Replacement of warped / bent / weather affected joinery, termite & borer affected joinery of wooden door / window shutters and frames. (b) Cracks in panels, bars / rails / styles of wooden door / window shutters etc. |
| (iv) | Builders Hardware | (a) Repairs / Replacement of loosened / premature failure of fittings including lever mechanics in door locks, hydraulic door closers, handles, tower bolts, cupboard locks etc. (b) Tightening / Replacement of sag in mosquito proofing SS net. |
| (v) | Steel & iron work | (a) Rectification / Replacement of defective part of girders, gate, shutter, etc. (b) Redoing of defective portion in fabrication / welding including painting thereon. (c) Structural steel work and SS railing. |

| | | |
|--------|----------------|--|
| | | (d) Windows, grills, gates etc. – Defects to be rectified. |
| (vi) | Roof treatment | (a) Rectification of leakage / seepage in roof slab, expansion/ seismic joints, floor junctions, inadequate/ faulty slope, drain outlets, including covering at junction till guarantee period. |
| (vii) | Finishing work | (a) Rectification of structural / superficial cracks. (b) Rectification of protruding / peeling off plaster. (c) Rectification of efflorescence, dampness appeared. (d) Undulation / unevenness in plaster. (e) Paint & polishing. |
| (viii) | Flooring work | (a) Rectification of sunken / deflected / depressed portion of plinth protection, flooring in rooms, toilets, entrance foyer, staircase and other locations. (b) Rectification / Replacement of settled floors. (c) Settlement of foundation & floors and resultant undulation of door finishes. (d) Rectification / Replacement of floor tiles which are sunken / uneven / undulating at joints / different in colour, texture, etc. |
| (ix) | Aluminium work | (a) Rectification / Replacement of defective part of Aluminium frame / shutters. |

Note: The above list is illustrative for civil work and not exhaustive. The rectification will include all Civil and Electromechanical works including internal and external services without any exclusion.

11.5 Release of Security Deposit: 25% security deposit will be released after expiry of 12 months from the date of completion of work on satisfactory performance during defect liability period, next 25% of the security deposit will be released after expiry of 24 months from the date of completion of work on satisfactory performance during defect liability period and remaining 50% of the security deposit will be released after expiry of 36 months from the date of completion of work on satisfactory performance during defect liability period.

11.6 Other Conditions:

- (a) The execution of items shall be carried out in accordance to relevant CPWD specifications. For the items which are not covered under CPWD Specifications, the Particular Specifications / B.I.S. Specifications shall have to be followed. The decision of Engineer-in-Charge shall be final in this regard.

- (b) The contractor shall make his own arrangement of water required for the work.
- (c) The contractor shall make his own arrangements for obtaining electric connection for carrying out any activity and make necessary payment to the department concerned. In the absence of electric connection or failure of power supply, the contractor shall make his own arrangements of generators.
- (d) No residential accommodation shall be provided to any of the staff engaged by the contractor. The contractor shall also not be allowed to erect any temporary set up for his staff in the campus.
- (e) No claim of the labourers shall be entertained including that of providing employment, regularization of services etc.

12 Safety measures:

- 12.1 The contractor shall have to provide the safety jackets (reflective), safety shoes, safety helmets (ISI mark) and safety belt (double harness clip type locking arrangement) to the workers as under the general obligations under contract, no separate payment on this account shall be made. All other safety provisions as existing in GCC 2014 and National Building Code shall also be applicable.
- 12.2 The contractor has to provide and make arrangement for safety net of required specification and strength to ensure proper safety of workers while working at heights. At least at two tiers safety net should be provided below the working platform. No separate payment on this account shall be made.
- 12.3 Double scaffolding system (cup and lock type) on the exterior side or wherever required of the building must be provided with 40 mm dia MS tube 1.5 mtr. Centre to centre horizontal and vertical tube joining with cup and lock system with MS tube, MS tube chollies, MS clamp and MS staircase system in the scaffolding for working platform etc.
- 13 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. Also any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time. In case of damage of any such services the same shall be repaired promptly by the contractor at his own cost and also keep the department indemnified at all times against any claim whatsoever generated by a third party on above account .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.
- 14 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.
- 15 The contractor shall take instructions from the Engineer-in-charge for stacking of materials. No excavated earth or building materials etc. shall be stacked/collected in areas where other buildings, roads, services, compound walls etc. are to be constructed.

- 16 No extra payment will be made for operation/activity mentioned at Sl. No. 1 to 16 above unless specifically mentioned otherwise.
- 17 If the work is carried out in more than one shift or during night no claim on this account shall be entertained.
- 18 The rate of items of flooring is inclusive of providing sunk flooring at bath rooms kitchen etc. and nothing extra on this accounts is admissible.
- 19 No payment shall be made to the contractor for any damage caused by rain, snowfall, floods, earthquake or any other natural causes whatsoever during execution of work. The damages of the work will be made good by the contractor at his own cost and no claim on this account shall be entertained.
- 20 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 their own cost to the notified/specified dumping. The malba / rubbish shall required to be removed from site of work on daily basis, if the same is not removed a token penalty of Rs. 250/- per day shall be levied till the removal of malba. This shall be recovered from the bill. The contractor should not throw the malba from higher floors directly on the ground. It should be brought down through the staircase by the workers or proper chute should be installed for this purpose.

SPECIAL CONDITIONS

1. The contractor shall execute the whole work in the most substantial and workmanlike manner in strict accordance with the specifications, approved design, drawings, particular specifications, special conditions, additional conditions and instructions of the Engineer-in-Charge.
2. Before tendering, the contractor shall inspect the site of work and structures and shall fully acquaint himself about the conditions prevailing at site, availability of materials, availability of land and suitable location for construction of go-downs, stores, site office, transport facilities, constraints of space for establishing design mix plants, weather condition at site, the extent of leads and lifts involved in execution of work etc., which may affect or influence the tenders. No claim whatsoever on account of above factors shall be entertained.
3. **Labour huts at site shall not be allowed.** The contractor shall make own arrangement on rent or otherwise, outside the IIT campus for labour hutment etc at his own cost.
4. The contractor shall at his own expense and risk arrange land for accommodation of labour. **However subject to availability and further with the restrictions as imposed by IIT Kanpur authorities, a small parcel of land may be provided on as is basis to the contractor in the construction site area for setting up of suitable temporary site office, storage of materials, erection of temporary workshops, small rest room and construction of approach roads to the site of work, connected with the completion of the work.** The contractor shall have to abide by the regulations of the authorities concerned and the directions of the Engineer-in-Charge strictly for use of land available at the site of work. Also if it becomes necessary during construction to remove or shift the stored materials, shed, workshop, access roads, etc to facilitate execution of the work included in this agreement or any other work by any other agency, the contractor shall have remove or shift these facilities as directed by the Engineer-in-Charge and no claim shall be entertained on such account. Also no claim on the basis of inadequacy, unsuitability or any other ground whatsoever regarding land provided shall be entertained.
5. It shall be deemed that the contractor has satisfied himself as to the nature and location of the work, availability of labour, materials, transport facilities, availability and suitability of land for setting up of camp, etc with respect to the work to be executed. The department will bear no responsibility for lack of such knowledge and the consequences thereof.
6. The contractor shall have to make approaches to the site, if so required and keep them in good condition for transportation of labour and materials as well as inspection of works by the Engineer-in-Charge. Nothing extra shall be paid on this account.
7. The contractor shall carry out true and proper setting out of the work in co-ordination with the Engineer-in-Charge or his authorized representatives and shall be responsible for the correctness of the positions, levels, dimensions and alignment of all parts of the structure. If at any time during the progress of the work any error appears or arises in the position, level, dimensions or alignment of any part of the work, the contractor shall rectify such error to the entire satisfaction of Engineer-in-charge. The checking by the Engineer-in-Charge or his authorized representatives shall not relieve the contractor of his responsibility for the correctness of any setting out of any line or level. The contractor shall carefully protect and preserve all bench marks, pegs and pillars provided for setting out of works. Nothing extra shall be paid on this account.
8. All setting out activities concerning establishment of bench marks, theodolite stations, centre line pillars, etc. including all material, tools, plants, equipments, theodolite and all other

instruments, labour, etc. required for performing all the functions necessary and ancillary thereto at the commencement of the work, during the progress of the work and till the completion of the work shall be carried out by the contractor and nothing extra shall be paid on this account.

9. The work shall be carried out in such a manner so as not to interfere or adversely affect or disturb other works being executed by other agencies, if any.
10. Any damage done by the contractor to any existing works or work being executed by other agencies shall be made good by him at his own cost.
11. The work shall be carried out in the manner complying in all respects with the requirement of relevant rules and regulations of the local bodies under the jurisdiction of which the work is to be executed and nothing extra shall be paid on this account.
12. The contractor may have to work in two or more shifts for completing the work in time, and no claims whatsoever shall be entertained on this account, notwithstanding the fact that the contractor will have to pay or may have paid 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 amount for any other reasons.
13. The contractor shall make his own arrangements for electricity including obtaining electric connection required and make necessary payments directly to the State / Central Govt. department concerned. Similarly the Contractor shall make his own arrangement for water and also get the water tested from laboratory approved by the Engineer-in-charge at regular interval as per the CPWD Specifications.
14. The drawings (structural and architectural etc) issued by the Engineer-in-Charge for the work during execution of work shall at all times be properly correlated before actually executing any work on site. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work and satisfy himself that the information available thereof is complete and unambiguous. The discrepancy, if any shall be brought to the notice of the Engineer-in-Charge before execution of the work and no claim whatsoever on the basis of discrepancies in the drawings shall be entertained. The contractor alone shall be responsible for any loss or damage caused by the commencement of work on the basis of any erroneous and or incomplete information.
15. The works to be governed by this contract shall cover delivery and transportation up to destination, safe custody at site, insurance, erection, testing and commissioning of the entire works.

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

 - (i) Preparation of detailed shop drawings and as built drawings wherever applicable.
 - (ii) Obtaining of Statutory permissions where-ever applicable and required.
 - (iii) Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
 - (iv) Warranty obligation for the equipments and / or fittings/fixtures supplied by the contractor.

Contractor shall provide all the shop drawings or layout drawings for all the co-ordinated services before starting any work or placing any order of any of the services etc. These shop drawings /layout drawings shall be got approved from Engineer-in-charge before implementation and this shall be binding on the contractor. The contractor shall submit material sample for approval of Engineer-in-charge get it approved prior to bulk supply of the material at site.
16. No payment shall be made to the contractor for damage caused by rain, whatsoever during the execution of works and any damage to the work on this account shall have to be made good by the contractor at his own cost.

17. Unless otherwise provided in the Schedule of quantities/tender document/CPWD Specifications, the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building and nothing extra shall be payable to him on this account.
18. Ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level, temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity connection, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various approvals, no objection certificates, completion certificates from local bodies etc, protection works, etc. during execution shall be deemed to be included in rates quoted of the contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. Before start of the work, the Contractor shall submit to the Engineer-in-Charge, a site / construction yard layout, specifying areas for construction, site office, positioning of machinery, material yard, cement and other storage, steel fabrication yard, site laboratory, water tank, etc.
19. No claim whatsoever for idle labour, additional establishments, costs of hire and labour charges for tools and plants, scaffolding etc, would be entertained under any circumstances. Similarly it is term of the contract that if the work gets delayed due to any site hindrance like trees, service lines, or for any other reasonable cause whatsoever only suitable extension of time for the contract shall be given but no claims whatsoever including claims of idle labour, idle machinery, cost of idle establishment, loss of profit etc on the ground of extension of contract beyond stipulated period shall be entertained even if the Extension is granted without levy of compensation by the Engineer in charge.
20. The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing safety nets (Safety to labours in case of fall from height), safety belts etc and other safety norms as specified in the general conditions of contract. In case of any accident of labours/ contractual staffs/third party the entire responsibility will rest on the part of the contractor and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor. The contractor shall be keep the department indemnified against any claim generated on any such account at all times.
21. Contractor shall within two weeks of award of work, submit to the Engineer-in-Charge for his approval, list of measures for maintaining safety of manpower deployed for construction and avoidance of accidents.
22. Scaffolding: Wherever required for the execution of work, all the scaffolding shall be provided and suitably fixed, by the Contractor. It shall be provided strictly with steel scaffolding system until specifically got approved otherwise from Engineer in charge , suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection. It shall be designed to take all incidental loads. It should cater to the safety features for workmen. It shall be ensured that no damage is caused to any structure due to the scaffolding. Nothing extra shall be payable on this account.
23. Royalty if any payable and all other incidental expenditure shall have to be paid by the contractor on all the boulders, metal shingle, earth, sand bajri, etc. collected by him for the execution of the work, direct to the concerned Revenue Authority of the State or Central Govt. and the amount paid shall not be reimbursed in any form whatsoever.
24. Other agencies working at site may also simultaneously execute the works entrusted to them and to facilitate their working, the contractor shall make necessary provisions e.g. holes, openings,

etc. for laying/burying pipes, cables, conduits, clamps, hooks, etc. as may be required from time to time. Nothing extra over the agreement rates shall be paid for doing this. The required materials/fixtures shall however be provided by department. Similarly other nearby projects may also be in progress in the campus and thus all reasonable coordination and assistance needs to be extended in order to avoid any hindrance to the nearby works. The contractor shall extend full co-operation to other agencies for smooth execution of works by other agencies. The final finishing of the work is to be executed in co-ordination with other agencies as directed by the Engineer-in-Charge.

25. Stacking of materials and excavated earth shall be done as per the directions of the Engineer-in-Charge. Double handling of materials or excavated earth if required shall have to be done by the contractor at his own cost.
26. In case of construction joints, the cost of applying cement slurry over the concrete surface before fresh concrete is laid as per para 5.4.4.4 of CPWD Specification 2009 is included in the relevant items of the schedule of quantities and nothing extra shall be paid on this account.
27. The rates quoted for all items shall be considered as inclusive of pumping/baling out water, if necessary, and no extra payment shall be made for pumping/baling out water. This includes water from any source such as rain, broken water mains or drains and seepage, surface and sub-soil water, rain etc. and shall apply to the execution in any season.
28. To protect the flooring and steps of staircases during construction and until the completion of the work, finished/semi-finished surface of flooring shall be covered with a thick layer of plaster of Paris and this layer shall be maintained in good condition till its removal. The removal of the layer of plaster of Paris and cleaning the surface shall be done as and when decided by the Engineer-in-Charge. After the removal of plaster of Paris and cleaning of the surface, damage, if any, shall have to be made good by the contractor. No extra payment shall be made for protection with plaster of Paris, removal of plaster of Paris, cleaning and making good the damages.
29. The contractor shall give a performance test of the entire installation(s) as per specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc and nothing extra whatsoever shall be payable to the contractor for the performance test.
30. The steel work in railing includes fish tailing of the section to be embedded in concrete and fixing the same.
31. Some restrictions may be imposed by the State Government on quarrying of sand, stones etc, from certain areas. The contractor shall have to bring such materials from other quarries located elsewhere for timely completion of work and nothing extra shall be paid on this account.
32. **The contractor shall give ten years guarantee in the prescribed proforma for water proofing items specified in the schedule of quantities. In addition to this, 10% of the executed cost of items shall be retained either in cash /fixed deposit or in the form of bank guarantee, which shall be released after the expiry of ten years from the date of completion if no defects is found in water proofing or the defects are made good. This amount shall be adjusted against the expenses incurred on making good the defects if the contractor commits breach of guarantee.**
33. In case of any difference in the Hindi version and English version in any of the condition of contract, English version shall prevail.
34. To facilitate gas connection, holes (if required by the Engineer-in-Charge) including suitable rubber gasket shall be provided in the kitchen platform of RCC slab/granite/marble/ other stone slab etc. Nothing extra will be paid on the account and rates quoted for relevant items are inclusive of making such provision.

35. Concrete mixers to be used on the work shall have arrangement for weighing aggregate, cement, water, admixture and controlling water cement ratio and admixture.
36. Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been in built in the items and nothing extra shall be neither payable nor extra cement considered in consumption on this account.
37. The contractor shall arrange to keep the premises neat and clean. The rubbish/malba and unserviceable materials shall be removed on day to day basis.
38. The Contractor shall arrange electricity, water and other facilities at his own cost for testing of the various electrical installations, fire pumps, wet riser / fire fighting equipments, fire sprinklers etc. and also testing water supply, sanitary and drainage lines, water proofing of underground sump, over head tanks. Nothing extra shall be payable on this account.
39. Bar Chart

The contractor shall give scientifically analyzed detailed bar chart for all the activities of the work within 15 days from the date of issue of letter of acceptance of tender. The bar chart shall be prepared by covering all the construction activities envisaged for construction work. Nothing extra shall be paid for preparation/ modification of bar chart, CPM and PERT chart. While preparing the above detailed bar chart, effort shall be made to take all possible items of work simultaneously.

PART-B

(For Civil Works)

GENERAL TERMS AND CONDITIONS (Civil Component)

1. **Specialized Agencies to be engaged for specialized items:**

The list of specialized items for the major component – civil works which are to be got executed only through specialized agencies are mentioned below:

CIVIL WORKS:

- a. Pre-Engineered Building/Structure
 - b. Anti-termite treatment.
 - c. Water proofing works.
 - d. Aluminium works.
- (i) The main contractor shall submit the credential of specialized agencies well in advance as per the direction of Engineer-in-charge. After verification of the same, written approval will be conveyed to main contractor in this regard. The credentials and expertise of the specialized agencies in the similar works should be commensurate the quantum and nature of the specialized works as per the guidelines provided in this tender document (Annexure-3). The main contractor shall not change the specialized agency without taking prior approval of Engineer-in-Charge. However before making any such change he has to enter into agreement with new agency and submit the same to Engineer – in – Charge for approval. This shall however be without any change in the accepted rates of the contract agreement and without any cost implications to the Department. The main contractor himself can also execute the specialized work in case he has executed the similar specialized work himself previously, under direct contract or on back to back basis, and submits experience credentials to the satisfaction of engineer in charge in this regard of having executed the specialized work commensurate the quantum and nature of the specialized works as per the guidelines provided in this tender document.
- (ii) It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main contractor shall be solely responsible for settling any dispute/litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies / sub-contractor(s). No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim what so ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection/rejection of the Specialized Agencies or any dispute amongst them.
2. The Contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the plot so as to achieve early completion. The agency should deploy adequate and suitable equipment, machinery and labour as required for the completion of the entire work within the stipulated period specified. Also ancillary facilities shall be provided by contractor commensurate with requirement to complete the entire work within the stipulated period. Nothing extra shall be payable on this account. Adequate number/sets of equipment in working condition, along with adequate stand-by arrangements, shall be deployed during entire construction period. It shall be ensured by the Contractor that

all the equipment, Tools & Plants, machineries etc. provided by him are maintained in proper working conditions at all times during the progress of the work and till the completion of the work. Further, all the constructional tools, plants, equipment and machineries provided by the Contractor, on site of work or his workshop for this work, shall be exclusively intended for use in the construction of this work and they shall not be shifted/ removed from site without the permission of the Engineer-in-Charge.

1. INSURANCE POLICIES:

The contractor in his own interest before commencing the execution of work, without in any way limiting his obligations and liabilities under this contract, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property, at site of work.

2. WARNING / CAUTION BOARDS:

All temporary warning / caution boards / glow signals display such as "Construction Work in Progress", "Keep Away", "No Parking", Diversions & protective Barricades etc. shall be provided and displayed during day time by the Contractor, wherever required and as directed by the Engineer-in-Charge. These glow signals and red lights shall be suitably illuminated during night also. The Contractor shall be solely responsible for damage and accident caused, if any, due to negligence on his part. Also he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. These signals shall be dismantled & taken away by the Contractor after the completion of work, only after approval of the Engineer – in – Charge. Nothing extra shall be payable on this account.

3. DISPLAY BOARDS: The Contractor shall provide and erect a display board of size and shape as required, in a legible and workman like manner showing the salient features of the project as directed by the Engineer-in-Charge. The Contractor shall fabricate and put up a display board of approved design indicating name of the project, Client/Owner, Engineer-in-charge, Architect and Structural Consultant, Department etc. besides providing space for names of Contractor, Sub-Contractor and specialized agencies etc at the site within 15 days from issue of award letter. Nothing extra shall be payable on this account. In case of non compliance/delay in compliance in this, a penalty @ Rs. 1000/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

4. The Contractor shall display all permissions, licenses, registration certificates, bar charts, minimum wage chart and other statements etc under various labour laws and other regulations applicable to the works at his site office.

5. Preparation of Sample units:

The contractor shall prepare in actual position sample unit for important items if required by Engineer-in charge and obtain approval of same before execution en masse. Nothing extra on account of preparation of such sample units shall be admissible. The E-in-charge may however solely as per his discretion permit the sample unit to be accounted as main work if the sample unit is found okay to his satisfaction. However if decided otherwise then the same shall be removed by the contractor.

6. Inspection of work:

The committee/consultant appointed by IIT,Kanpur may inspect the works including workshops and fabrication factory to ensure that the works in general being executed according to the design, drawings and specifications laid down in the contract. Their observations shall be communicated by the Engineer-in Charge and compliance is to be

reported by the contractor to the Engineer-in-Charge.

7. The contractor should keep up-to-date the following:
 - a) Display Board showing detail of work, weekly progress achieved with respect to targets, reason of shortfall, status of manpower, wages being paid for different categories of workers.
 - b) Entrance and area surrounding to be kept clean.
 - c) Display layout plan key plan, Building drawings including plans, elevations and sections.
 - d) Display of upto date program chart etc prepared in the approved computer software.
 - e) Keep details of quantities executed, balance quantities, deviations, possible Extra item, substituted Item etc.
 - f) Keep one sets of plastic / cloth mounted building drawings.
 - g) Sets of Helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.

SPECIAL CONDITIONS FOR CEMENT AND STEEL BROUGHT BY THE CONTRACTOR:

CEMENT:

1. The contractor shall procure Portland Pozzolana Cement conforming to IS: 1489 (Part-I) as required in the work, from reputed manufacturers having a production capacity not less than one million tons per annum. The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacturer(s) which the tenderer proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufacturers, given by the tenderer, fully or partially.

Supply of cement shall be taken in 50 kg bags or bulk container bearing manufacturer's name and ISI marking. The bulk supply of cement shall be accompanied by the manufacturer's certificates giving full details (brand, type, grade and specification along with the requisite test certificate, copy of relevant IS specifications). Samples of cement arranged by the contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of relevant BIS codes. 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. Every fresh cement batch should be brought to site at least 30 days before they are to be used / consumed in the work.

- 1.1. The cement shall be brought at site in bulk supply of approximately 100 tonnes or as decided by the Engineer-in-Charge.
- 1.2. The cement go-down of the capacity to store a minimum of 60 days requirement shall be constructed by the contractor at site of work for which no extra payment shall be made. Double lock provision shall be made to the door of cement go-down. The keys of one lock shall remain with Engineer-in-Charge or his authorized representative and keys of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of the cement go-down. The contractor shall facilitate the inspection of the cement go-down by the Engineer-in-Charge or his authorized representatives.
- 1.3. The cement shall be got tested by the Engineer-in-Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The frequency and details of the tests shall be decided by the Engineer-in-Charge depending on the quantum of supply in each batch. The cost of tests shall be borne by the contractor / Department in the manner indicated below:
 - a. By the contractor, if the results show that the cement does not confirm to the relevant BIS codes.
 - b. By the Department, if the results show that the cement confirms to relevant BIS codes.

- 1.4. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at rate so prescribed shall be made. In case of excess consumption no adjustment shall be made.
- 1.5. 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.
- 1.6. Damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-charge. If he does not do so within 3 days of receipt of such notice, the Engineer-in-charge shall get it removed at the risk and cost of the contractor.
- 1.7. Cement register for the cement shall be maintained at site. The account of daily receipts and issues of cement shall be maintained in the register in the Performa prescribed and signed daily by contractor or his authorized agent.

2. **STEEL**

- 2.1 The Contractor shall procure IS marked TMT bars of various grades from the steel manufactures or their authorized dealers (as per following selection criteria) having valid BIS license for IS 1786-2008 (Amendment -1 November 2012). Such TMT bars shall be as per the preferred make list of this tender document or should be amongst the preferred makes (part of this tender document).

The procured steel should have following qualities:-

- i. Excellent ductility, bend ability and elongation of finished product due to possible refining technology.
- ii. Construction of steel should be accurate as per design.
- iii. Steel should have no brittleness problem in finished product.
- iv. Steel should carry the quality of corrosion and earthquake resistance.
- v. Quality steel with achievement of proper level of sulphur and phosphorus as per IS :1786-200b)

- 2.2 The contractor shall have to obtain and furnish test certificates to the Engineer-in-charge in respect of all supplies of steel brought by him to the site of work.
- 2.3 Samples shall also be taken and got tested by the Engineer-in-charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week of written orders from the Engineer-in-charge to do so.
- 2.4 The steel reinforcement bars shall be brought to the site in bulk supply of 10 tonnes or more or as decided by the Engineer-in-Charge.

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

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

- 2.6 For payment purpose, the average unit weight of the reinforcement shall be calculated as follows:-

To arrive at unit weight for the purpose of payment three random samples each of 1 meter length shall be collected for each diameter of re-bar from every consignment received at site. Actual weight of three specimens for each diameter shall be taken and average weight calculated and recorded. The average weight so arrived at shall be compared with the theoretical weight of that particular diameter of rebar. Actual or theoretical weight whichever is less shall be considered for making payment for that consignment. However final payment shall be made on the basis of weighted average of all the consignment. The decision of the Engineer in-charge as regards the random samples and average weight shall be final and binding on the contractor and no claim of any kind shall be entertained in this regard.

- 2.7 The contractor shall supply free of charge the steel reinforcement required for testing including its transportation to testing laboratories.
- 2.8 The steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge.
- 2.9 The contractor should submit pre measurement of existing exposed reinforcement to the Engineer-in-charge before taking up any further reinforcement work on the portion and nothing extra shall be paid on this account.
- 2.10 The measurement for steel shall be as per relevant para of CPWD specifications. **The Contractor has to produce the copy of the bills/challans to the Engineer in charge or his representative as and when he brings the cement and steel to the site.**

SPECIAL CONDITIONS FOR RMC AND DMC

1. The bidder shall install duly calibrated one number fully automatic concrete batch mix plant of minimum capacity 18 cum/hr along with compatible concrete pumps and pipes etc within 30 days from the date of start of work failing which recovery will be made at Rs. 1,000/- per day till the automatic concrete batch mix plants, concrete pumps and pipes are made available at site to the satisfaction of Engineer-in-Charge. The batch mix plant shall be fitted with control equipment to allow the correct operation of the plant to be monitored during weighing and batching. Automatic control systems on batching plants shall not commence batching until all hoppers have been emptied and / or tared and the scales zeroed unless such systems are designed to take account of build up in their programming.

Or/alternatively

- The contractor is permitted to procure concrete from outside sources/Plants (such source/plants should be got approved from Engineer in charge) also, provided the quality, workability etc of the procured and the manufactured concrete is acceptable to the Engineer in charge. The contractor should have completed the Design mix of procured concrete from approved labs to the satisfaction of the Engineer in charge. The printout of computerised batch mix reports of the concrete procured shall be submitted. The bidder shall enter into an MOU within 30 days of award of the work, with an approved outside sources/Plants for the design mix concrete. The outside sources/Plants shall also allow inspection of the plant by the IWD offices as and when required. The necessary compatible concrete pumps and pipes etc shall be arranged by the contractor and shall be kept at site during casting.
2. The various ingredients for mix design / laboratory tests shall be sent to the lab / test houses (e.g. IIT Kanpur, IIT Roorkee, BHU, MNIT Allahabad, HBTI- Kanpur, IET-Lucknow or any other lab as decided by Engineer in charge) through the Engineer-in-Charge and the samples of such ingredients sent shall be preserved at site till completion of work or change in Design Mix / Ready Mix whichever is earlier. **The contractor is permitted to initiate the job mix design after issue of letter of acceptance if requested by him in writing. The Engineer in charge shall give written permission to such request.** The date of start of work shall however be not altered and it shall remain as defined in schedule F. The sample shall be taken from the approved materials which are proposed to be used in the work. The cost of packaging, scaling, transportation, loading, unloading, cost of samples and the mix design charges in all cases shall be borne by the contractor. The concrete should have sufficient workability for pumping through concrete pump (CPWD Specifications and BIS codes to be followed). Admixtures may be added by the contractor in the concrete to increase the workability, but the design mix of concrete shall be done, taking into account the admixture proposed. Under no circumstances shall the water cement ratio be increased beyond the permissible limit. The minimum cement permitted for RCC work of grade M25

- is 330kg/cum. If required, extra cement may be used by the contractor to get the desired quality of concrete, which shall be paid extra. But, if the cement consumption increases beyond 360kg/cum of concrete, for M25 grade concrete, the payment for extra cement shall be restricted as concrete with cement content of 360kg/cum of concrete.
3. For each change of source or quality / characteristic properties of the ingredients during the work, from that approved and used in the concrete mix, a fresh mix design shall be got done by the contractor. Revised trial mix test shall be conducted and shall be submitted by the contractor as per the direction of the Engineer-in-Charge.
 4. The items of RMC and DMC shall be inclusive of all the ingredients including admixtures if required, labour, machinery T&P etc., (except shuttering which will be measured and paid for separately) required for a ready mix concrete of required strength and workability. The rate quoted by the agency shall be net and nothing extra shall be payable on account of change in quantities of concrete ingredients like aggregates and admixtures etc., as per the approved mix design.

Annexure-3
Engagement of agency for specialized Civil works:

1 The Contractor has to engage specialized agencies for specialized items of works such as water proofing, aluminum works & structural glazing. Only those specialized agencies/firms who have satisfactorily executed works (In India) as per following criteria during last seven years are eligible for the specialized works-

A- Pre Engineered building

(a) Three similar works each having plinth area not less than 960 Sqm each.

Or

(b) Two similar works each having plinth area not less than 1440 Sqm each.

Or

(c) One similar work having plinth area not less than 1920 Sqm each.

(Similar work shall mean pre-engineered building as defined and detailed in this tender document)

B- Aluminum work

(a) Three works, each having work with weight of aluminium work as 5100 Kg.

Or

(b) Two works, each having work with weight of aluminium work as 7700 Kg.

Or

(c) One work, having work with weight of aluminum work as 10200 Kg.

C- Water Proofing work:

(a) Three works each costing not less than Rs 1, 76,000.

Or

(b) Two works each costing not less than Rs 2, 64,000.

Or

(c) One work costing not less than Rs 3, 52,000.

(Similar shall work mean water proofing works)

D- Anti Termite Treatment:

(a) Three similar works each costing not less than Rs 8000.

Or

(b) Two similar works each costing not less than Rs 12000.

Or

(c) One similar work costing not less than Rs 16000.

(Similar work shall mean work of anti termite treatment)

Approval of the specialized agencies for each specialized work shall be obtained from the Engineer-in-Charge within one month of award of work. The evidence of completion of the specialized work by the proposed agency shall be submitted by the main contractor. The engineer-in-charge may get the work inspected to satisfy regarding the quality and the claim made by the proposed specialized agency. The decision of the engineer in charge in this regard shall be final. Even if, such specialized items of work shall be executed by the specialized agencies, the work shall be deemed to be executed by the tenderer for all purposes and the responsibility of the quality of items of works executed etc. shall continue to be that of the tenderer only. The main contractor himself can also execute the specialized work in case he has executed the similar specialized work himself previously and submits experience credentials in this regard of having executed the specialized work commensurate the quantum and nature of the specialized works as per the guidelines provided in this NIT.

Particular Specification:

1.AAC BLOCK WORK: The AAC block shall conform to grade I of IS : 2185 part 3 (1984).The precast AAC blocks shall be procured from approved manufactures only and shall not be permitted to be cast at site.

Acceptance criteria- The Blocks shall be of grade I confirming to S.No. (ii) or S.No (iii) of table No.1 of IS 2185 Part-3. Drying shrinkage shall not be more than 0.05 %. The maximum variation in the length of the units shall not be more than ± 5 mm for length and ± 3 mm for width.

(2).Double Skin Insulated Roofing Sheet:**a) RAW MATERIAL**

Base Steel: Hi-Rib profile external sheet manufactured out of 0.5 mm TCT(Total Coated Thickness) having 550 Mpa yield strength The steel sheet manufacturer's test certificate for the chemical and mechanical properties of steel must be concerned authority prior to installation. The inner sheet shall be 0.5 mm Hi-Rib SMP Coated Galvalume hi-tensile steel in similar dimensions / size.

Metallic Coating: SMP color coated Galvalume steel (150 GSM Zinc aluminum alloy coating mass total of both sides, AZ150 or equivalent coating as per AS 1397).

b) PROFILE: The sheets shall have 1000-1020mm cover width, 28-30 mm high crests at 200-250 mm wide pan with special male / female side laps and anti siphoning feather to prevent leakages..

c). TRIMS & GUTTERS: Roof flashing and trims (parapet flashing, transition trims, expansion joint trims and ridge caps) shall be manufactured from same color, finish and thickness as roof panels (or manufacturer's recommendation).**Gutters** and downspouts are manufactured from same color, finish and thickness as roof panels (or as desired by Engineer in charge). (Note: The shape and girths shall be as per design requirement and shall be approved by the concern authority.)

d) INSULATION: An insulation 50 mm thick glass wool insulation of (24 kg-density) wrapped in black polythene sheets shall be fixed bêtes in the cavity between two sheets.

e). ACCESSORIES: i) Fasteners: The steel sheet shall be fastened with min. 40 μ m zinc coated or min. 20 μ m Zinc-Tin alloy coated, Hex head, self-drilling screw as per AS 3566 Class 3 fasteners with EPDM washer on each crest of sheets for connecting with purlin (or as per design) perpendicular to the sheeting and in the centre of the corrugation or rib. The fastener size shall be calculated as per the design requirement.

ii) In-fill strips: The infill strips are manufactured from closed cell polyethylene foam. This material should have uniform compressibility, waterproof, weather resistance, UV resistance, chemical resistance, non toxic, odorless and environment friendly to meet installation requirement in accordance with AS 2424-4 3 A &B or equivalent and approved by engineer-in-charge.

iii) Sealant: It should be acid free neutral curing silicone rubber sealant of approved make. It shall be applied at all end laps as per manufacturer's recommendation and approval by engineer-in-charge.

e.) INSTALLATION -- ERECTION AND FIXING

The installation shall be done in accordance to the standard practices as specified by the manufacturer and as approved by the Engineer in charge. All sheets and accessories must be stored and finally erected without any damage.

- **Fastening sheet to support:** The inner sheet fixed to the structure (by others) by means of corrosion protected self drilling, self tapping fasteners. The sub –grits of size 50mm x 50mm x 50 mm manufactured out of 1.6mm G.I. ‘Z’ Shape would be fixed to inner sheeting on face side at purlin locations by means of galvanized polymer coated self drilling, self tapping fasteners thru the crest etc, as per direction of Engineer-in-Charge. The outer sheeting shall be fixed with similar screws as of inner sheeting on to the sub frits.
- **End Lap:** All the sheet end lap (roof) shall have an overlap of 150 mm to 250 mm for a slope more than 15 degree (1 in 4) and 200 mm to 300 mm for slope less than 15 degree. The silicon sealant shall be applied at both the ends of the sheet at the overlap with stitch fasteners as per manufacturer’s recommendations and conforming to AS 3566-2002 Class 3.
- **Side lap:** The edge of roofing sheet with the anti-capillary groove is always the underlap . It is preferred to use fasteners alongside-laps however, when cladding is supported as indicated in maximum support spacing, side-lap fasteners are not usually needed for strength.
- Other preferred practices or recommendation of manufacturer shall be followed for good installation.

f.) Measurement: The CPWD specification 2009 with upto date correction slips for measurement of corrugated GI sheets and its accessories shall be followed except where specifically provided otherwise in the schedule of quantity.

g.) Rate: As per the CPWD specification 2009 with upto date correction slips for measurement of corrugated GI sheets and its accessories shall be followed except where specifically provided otherwise in the schedule of quantity.

(3). SUPPLY, FABRICATION, TRANSPORTATION, ERECTION SPECIFICATIONS OF PRE- ENGINEERED BUILDING (PEB) STRUCTURAL STEEL:

Structural Steelwork-Specifications- General

Scope of Specification

This specification covers the general scope of work of PEB structural steel works, submittals by the Contractor, applicable codes of practice for structural steel work and the specifications for the materials to be used, including steel, bolts & nuts, washers etc and the storage thereof.

Scope of Work

The scope of work for the contractor in respect of structural steel work shall cover, but shall not be limited to the following:

A. Preparation of complete detailed shop fabrication drawings based on the design drawings for approvals, required for all the permanent structures.

- B. Submission of revised design, with calculations and detailed fabrication drawings, in case any substitution of the designed sections is required.
- C. Submission and getting approval of details for casting of deck slab in the erected “PEB Steel structure”
- D. Procurement and testing of all raw structural steel materials in lots for fabrication taking into account wastage margin etc., including storage and upkeep of the materials.
- E. Providing all materials, labour, tools & plant and equipments and all types of consumables required for fabrication using Metal Arc welding or as mentioned in approved fabrication drawing including all necessary bolts, nuts, washers with wastage margins.
- F. Fabrication of the PEB steel works in accordance with the approved fabrication drawings, including all shop assembling, matching and marking. Design, manufacture/fabrication and provision of all jigs, fixings, manipulators etc. required for the fabrication are included in item.
- G. Suitably marking, bundling and packing for transport of all fabricated materials.
- H. Preparing and furnishing detailed bill of materials, drawing Office dispatch lists, Bolts Lists and any other lists of bought out items as applicable and desired by Engineer-in charge required in connection with the fabrication of the PEB steelwork.
- I. Loading and transporting all fabricated steelwork and field connection materials including site unloading and erection of PEB structure in final position with all bolts, nuts, insert plate etc.
- J. To submit the methodology & procedure for erection of PEB structure compatible with the details of fabrication. Also complete drawings & phase wise instructions for all the activities required to erect PEB steel structure in final position, shall be submitted.
- K. The contractor shall provide general assistance during complete erection for solving any problem related to fabrication or site assembling of the structural steelwork. The contractor shall ensure the presence of the qualified and experienced site Engineer during complete erection work at site.
- L. All major/ minor modifications of the fabricated steel structures, as directed by the Engineer-in-charge, including but not limited to the following:
- i) Removal of bends, kinks, twists etc. for parts damaged during transportation and handling.
 - ii) Cutting, chipping, filling, grinding etc. if required or preparation and finishing of site connections.
 - iii) Reaming of holes for use of higher size bolt if required.
 - iv) Re-fabrication of parts damaged beyond repair during transport and handling or re-fabrication of parts which are incorrectly fabricated.
 - v) Fabrication of parts omitted during fabrications by error, or subsequently found necessary.

- vi) Drilling of holes which are either not drilled at all or are drilled in incorrect location during fabrication.
- vii) Carry out tests in accordance with the related Specification which will be inspected by Engineer-in-charge.
- viii) Details of erection equipment machinery including capacity & specifications, tools, tackles etc. to be used for erection purpose.
- ix) All procedures and tests on welds as per specifications and welded parts to ensure the strength requirements of joints.

Submittals

- A. On commencement of the work pertaining to steel structure, the Contractor shall submit the following in four sets:
 - i) Prior to the technical submittals, the contractor shall submit detailed baseline program & methodology indicating the proposed overall schedule for documentation such as calculations, material procurement schedule based on availability with approved suppliers, shop/working drawings, plan/ procedures and records. Submission of samples, inspection by Engineer-in-Charge, process of fabrication/ delivery to site storage yard/ erection site for the approval of the Engineer-in-charge.
 - ii) Complete fabrication drawings, Bill of materials, cutting lists, bolt lists, welding schedules and Quality Assurance schedules, based on the concept drawing furnished to him and in accordance with the approved schedule. It is highlighted that structural steel member dimensions indicated in tender drawings are tentative only, and may be modified during final design stage.
 - iii) Results of any tests, as and when conducted and as required by the Engineer-in-charge.
 - iv) Manufacturer's mill test reports/certificates in respect of steel materials, bolts, nuts and electrodes, wires as may be applicable.
 - v) A detailed list of all constructional Plant & Equipment, such as hydra, derricks, winches, welding sets, etc. he will employ on the job to maintain the progress of work in accordance with the contract.
 - vi) Complete scheme with drawings for the erection of steel structures.
- B. The contractor shall submit complete design calculations for any alternative sections proposed by him, for approval of the Engineer-in-charge. Use of any alternative section shall be subject to approval of the Engineer-in-charge. However, no extra payment will be entertained on this account.

Furnishing of Information

- A. Concept drawings shall be furnished to the contractor and all such drawings shall form part of these Specifications. The availability of structural member mentioned in the drawings may be checked and if not available may be brought under notice of Engineer in charge.
- B. The Engineer-in-charge reserves the right to make changes in the design drawings even after release for preparation of shop drawings to reflect addition, omission & modifications in data/details and requirements. Contractor shall consider such changes as part of these Specifications and the contract, and no extra claims shall be entertained on this account.
- C. The design drawings submitted by the contractor will show as appropriate the salient dimensions, design loads, sizes of members and welding location of and other necessary information required for the preparation of fabrication drawings, designs and erection details.
- D. It shall be clearly understood that the drawings submitted to the contractor will be concept drawings. The typical details of connection, cuts, gusset plate shapes notches, bends, etc. where shown in the drawings are only for general guidance of the contractor. The contractor shall develop all such details based on these drawings.
- E. In case of variations in drawings and specifications, the decision of the Engineer-in-charge shall be final. Should the contractor, find any discrepancy in the information furnished to him, same shall be immediately brought to the notice of Engineer-in-charge for resolution. The contractor shall obtain clarifications on discrepancies from Engineer-in-charge before proceeding with the work.
- F. No detailed shop drawings will be accepted for examination by the Engineer-in-charge unless these have first been completely checked by the contractor's qualified structural engineer. The contractor shall check and ensure that detailing of connections is carefully planned to obtain ease in erection of structures, including field bolting or field connection of temporary structure to permanent structure. Any temporary structure which is used for erection or launching purpose and required to be welded to permanent structural works shall be accounted for in fabrication drawings. Permission shall be obtained before welding or holing is done in permanent structures other than as shown in design drawings or approved fabrication drawings. In case of field bolted connection between temporary structure and permanent structural works, all necessary holes provision shall be left during fabrication in shop.
- G. No fabrication work shall be started by the contractor without approval of Engineer-in-charge on the relevant drawings. Approval by the Engineer-in-charge of any of the drawings shall not relieve the contractor of his responsibility of workmanship, fit of parts, details, materials and errors or omissions of any work.
- H. The contractor shall furnish adequate prints of shop drawings as advance drawing (for approval) and adequate prints of all approved final shop drawings along with soft copy on CD for field use and record purpose.
- I. The Contractor shall specify the name of workshop where he intends to get the fabrication work carried out. The fabrication shop shall consists of at least sub-merged arc/metal arc welding machine, shearing machine, CNC plasma machine, pug mill, flame cutting machine, grinders, equipments etc.

- J. The drawings prepared by the Contractor, and all subsequent revisions thereof shall be at the cost of the Contractor, and no separate payments shall be made for the same. Revisions shall incorporate all modifications, field changes, substitutions etc. effected. The rates/prices quoted for steel work item shall be deemed to include the cost of such drawing work.
- K. The Contractor shall give due consideration to the need of trial assemblage at shop, weight and size limitation of elements for transportation from shop to site storage yard/Erection site, temperature variation of 25 degree centigrade between the fabrication shop and site, site measurements of as-built dimensions and position of pockets etc. for bolts and avoidance of site welding except for fixtures. All the drawings shall be prepared in metric units. The drawings should preferably be of A-1 standard size, and the details shown therein shall be clear and legible. These drawings shall include but shall not be limited to the following:
- i) Assembly drawings, giving exact sizes of the sections to be used and identification marks of the various sections members.
 - ii) Dimensional drawings of base plans, anchorage detail of bearing bolts location etc.
 - iii) Complete Bills of Materials and detailed drawings of all sections including their billing weights.
 - iv) Detailed shop drawings for proper co-ordination with the concrete components to which the steel members shall be connected, as required.
 - v) Any other drawings or calculations that may be required for proper completion of the works and clarification of the works or substituted parts thereof.
 - vi) All 'as-built' drawings in adequate prints and on CD.

Applicable Codes of Practice

The following specifications, standards and codes of practice are included as part of this Specification. All Standards, specifications, codes of practice including all correction slips/ amendments current on the date of signing of agreement and referred to herein shall be applicable. In case of discrepancy between this Specification and those referred to herein, this specification shall govern. In case of discrepancy between Contract drawings and this specification, the Contract drawings shall govern.

1. IS: 226 Structural Steel (Standard Quality)
2. IS: 800 (1984) Code of Practice for General Construction in Steel.
3. IS: 808 (1989) Dimensions for Hot Rolled Steel Beam, Column, Channel and Angle Sections.
4. IS: 813 Scheme of Symbols for Welding
5. IS: 814 (1991) Covered Electrodes for Manual Metal Arc Welding of Carbon & Carbon -Manganese Steel.
6. IS: 815 Classification Coding of Covered Electrodes for Metal Arc Welding of Structural Steel
7. IS: 816 (1969) Code of Practice for Use of Metal Arc Welding for General Construction in Mild Steel.
8. IS: 817 (1969) Code of Practice for Training and Testing of Metal Arc Welders.
9. IS: 822 Inspection of Welded Connection
10. IS: 823 Specification for Workmanship of Steel Structure
11. IS: 919 (1993) ISO System of Limits & Fits (Part 1 & Part 2)

12. IS: 961 Structural Steel (High Tensile)
13. IS: 1024 Code of Practice for use of Welding in Bridges and Structures
Subject to Dynamic Loading
14. IS: 1148 (1982) Hot Rolled Rivet Bars (upto 40mm) for Structural Purposes.
15. IS: 1161 Steel Tubes for Structural Purposes
16. IS: 1182 (1983) Recommended Practice for Radio Graphic Examination of Fusion
Welded Butt Joints in Steel Plates.
17. IS: 1363 (1992) Hexagon Head Bolts, Screws and Nuts of Product grade C.
(Part 1 to Part 3)
18. IS: 1364 (1992) Hexagon Head Bolts, Screws and Nuts of Product Grades A &B
(Part 1 to 5)
19. IS: 1367 (1991) Technical Supply Conditions for Threaded Steel Fasteners.
20. IS: 1852 (1985) Rolling & Cutting Tolerances for Hot-Rolled Steel Product.
21. IS: 1977 (1975) Structural Steel (Ordinary Quality).
22. IS: 2016 (1967) Plain Washers.
23. IS: 2062 (1992) Steel for General Structural Purposes.
24. IS: 2595 (1978) Code of Practice for Radio Graphic Testing.
25. IS: 3600 (1985) Methods of Testing Fusion Welded Joints.
(Part 1 to Part 9)
26. IS: 3613 (1974) Acceptance Tests for Wire Flux Combinations for Submerged Arc Welding.
27. IS: 3658 (1981) Code of Practice for Liquid Penetrant Flow Detection.
28. IS: 3757 (1985) High Strength Friction Grip Bolts
29. IS:4000 (1992) High Strength Friction Grip Bolts in Steel Structures-Code of
Practice
30. IS: 4353 (1967) Recommendations for Submerged Arc Welding of Mild Steel and Low Alloy
Steel.
31. IS: 4923 Hollow Steel Sections for Structural Use
32. IS: 4943 (1968) Assessment of Butt and Fillet Fusion Welds in Steel Sheet, Plate and Pipe.
33. IS: 5334 (1981) Code of Practice for Magnetic Particle Flow Detection of Welds
34. IS: 5369, 5370 General Requirements for Plain Washers and Lock Washers.
(1975)
35. IS: 5372 (1975) Taper Washers for Channels
36. IS: 6610 Heavy Washers for Steel Structures
37. IS: 5374 (1975) Taper Washers for I Beams.
38. IS: 6227 Code of Practice for Use of Metal Arc Welding in Tabular Sections
39. IS: 6623 (1985) Specification for High Strength Structural nuts
40. IS:6649 (1985) Specifications for hardening and tempering washers for high strength
structural nuts
41. IS: 6755 (1980) Double Coil Helical Spring Washers.
42. IS: 7215 (1974) Tolerances for Fabrication of Steel Structure.
43. IS: 7205, 7273, Safety Requirements for Steel Construction
7269
44. IS: 7269, 7293 Handling of materials & Equipments for Safe Working
45. IS: 7307 (Part I) Destructive & Non-Destructive Test of Welds
41. IS: 7318 (1974) (Part I) Approval Tests for Welders When Welding Procedure Approval is
not required -fusion Welding of Steel.
46. IS:8500 (1991) Structural steel -Micro alloyed (Medium and High Strength Qualities) .
47. IS: 8613 Wise Flux Combinations for Welded Joints

48. IS:8910 (1978) General requirements of Supply of Weldable Structural Steel.
 44. IS: 9595 (1980) Recommendations for Metal Arc Welding of Carbon & Carbon-Manganese Steels.
 49. IS: 12843 Tolerances for Erection of Structural Steel Works
 50. IRC: 24: Section V Standard Specifications and code of Practice for Road Bridges: Steel Road Bridges
 51 IRC:22-1986 Standard specification for road bridges
 Section VI – Composite construction

PRODUCTS

Materials

- A. All materials to be supplied by the Contractor shall conform to relevant Indian Standards as approved by the Engineer-in-charge.
- B. Steel materials required for the work shall be free from imperfections, mill scales, slag intrusions, laminations, pittings, rusts etc. that may impair strength, durability and appearance. All materials shall be of tested quality only. Test Certificates in respect of each consignment shall be submitted to Engineer-in-charge before use in work. Whenever the materials are permitted for procurement from identified stocks, a random sample shall be tested at an approved laboratory, as directed by the Engineer-in-charge.

Structural Steel

- A. Structural steel conforming to IS: 2062: Grade BR (yield strength=350 MPa) shall be used for main members of girder structures, cross girder members, bracings, gussets plates etc unless specifically provided in the drawings otherwise.

Bolts and Nuts

Unless otherwise specified all anchor bolts shall be of property class of 8.8 (and size M20 or as specified) and shall conform to IS: 1363 (1992), IS:1364 (1992) and IS:1367, as applicable, and unless specified otherwise, head shall be hexagonal. All nuts shall conform to property class compatible with the property class of the bolt used.

Washers

Unless otherwise specified on drawings washer for HSFSG bolts shall be conforming to IS:6649 .

Also plain washers shall be conforming to IS:5369 , unless otherwise specified. One washer shall be supplied with each bolt and, in case of special types of bolts, more than one washer as needed for the purpose shall be supplied.

STORAGE OF MATERIALS

General

All materials shall be so stored as to prevent deterioration, and to ensure the preservation of their quality and fitness for the work. If required by the Engineer-in-charge, the materials shall be stored under cover and suitably painted for the protection against weather condition. Any material, which has deteriorated or has been damaged shall be removed from site and replaced by new members, as directed by the Engineer-in-charge at no extra cost and time.

- A. The steel to be used in fabrication shall be stored in a separate stack clear of the ground section wise and lengthwise.
- B. The storage area shall be kept clean and properly drained. Structural steel shall be so stored and handled in such a manner that members are not subjected to excessive stresses and damage. Girders and beams shall be placed in upright position. Long members shall be supported on closely spaced skids to avoid unacceptable deflection.
- C. The Contractor shall have a suitable shop storage yard at his own premises for storing the fabricated steel structures and other materials. The yard shall have proper facilities such as drainage and lighting including access for cranes, trailers and other heavy equipments.
- D. All Shop / field connection materials, shop paints etc. shall be stored on racks and platforms, off the ground in a properly covered building by the contractor.

STRUCTURAL STEELWORK SPECIFICATION FOR WELDED STRUCTURE

General

Scope of Specification

This Specification covers the supply, fabrication transportation and erection at Site of welded structural steelwork, including the supply of approved consumables, electrodes, wires and other materials required for fabrication and field connections of all structural steelwork covered under the scope of the Specification. The shear connectors studs (if specified) in the drawing shall also be welded in the shop.

Execution

Workmanship

General

All workmanship shall be in accordance with the best practices in modern structural shops. Greatest accuracy shall be maintained in the manufacture of every part of the work and similar parts shall be strictly interchangeable. The contractor shall not proceed with any welding until the Engineer-in-charge has approved his welding plan, which shall include.

- All information's on welding procedures, equipment, additives and preheating during welding operation.
- Details of non destructive testing methods
- Precautions with regard to welding shrinkage
- Possible treatment of completed welds by grinding
- Procedure and programme of welding sequence

Templates

Templates used throughout the work shall be of steel. In cases where actual materials have been used as templates for drilling similar pieces, the Engineer-in-charge shall decide whether such materials are fit to be used as parts of the finished structure.

Straightening

All materials shall be straight and free from twists, and if necessary, before being worked, shall be straightened and/or flattened by pressure, unless required to be of curvilinear form.

Clearance

The clearance between fraying surface of bolted connections shall not be greater than 1mm at each end. If separation is between 1 to 3mm, the surface should be tapered to eliminate the separation. Separation of 3mm or more shall be filled with filler plates / washers. Such situations may be avoided and if situations are more, the correction may be carried out by the contractor as per the direction of the Engineer-in -charge.

Shearing, Cutting and Planning

Cutting shall be done automatically. Cutting by shearing machine may be used for plates not exceeding 10 mm in thickness provided that the plate edges be fully enclosed in a weld. For Plates above 10mm, CNC plasma cutting shall be used provided a smooth and regular surface free from cracks and notches is secured.

1. Chipping of edges of plates, wherever necessary, shall be done without damaging the parent metal. Chipped edges shall be ground to a neat finish and sharp corners and hammered rough faces shall be rounded off.
2. The edges and ends of all cut/sheared plates shall be planed/ground. Edge preparation for welding may be done by machine controlled flame cutting, with edges free from burrs should be clean and straight.
3. The butting surfaces at all joints of girders shall be planed so as to butt in close contact throughout the finished joint.

Assembly

1. All parts assembled for welding shall be in as close contact as practicable over the whole surface.
2. The component parts shall be so assembled that they are neither twisted nor otherwise damaged. Specified cambers, if any, shall be provided.
3. All parts of bolted and welded members shall be held firmly in position by means of jigs or clamps while bolting or welding. No drifting of holes shall be permitted, except to draw the parts together and no drift used shall be larger than the nominal diameter of the bolt. Drifting done during assembling shall not distort the metal or enlarge the holes.
4. Trial assemblies shall be carried out at the fabrication stage to ensure trial assemblies, accuracy of workmanship. These checks shall be witnessed by the Engineer-in-charge and such trial assemblies shall be at the cost of the Contractor. Nothing extra is to be paid for.

Welding

General

The welding shall conform to code, IS: 816 and IS: 9595 and other applicable codes and standards, unless otherwise specified. As much work as possible shall be welded in shops and

the layout and sequence of operations shall be so arranged as to eliminate distortion and shrinkage stresses.

Electrodes/Wires / Flux

All electrodes/ wires / flux shall be kept under dry conditions. Any electrode / wires /flux damaged by moisture shall not be used unless it is guaranteed by the manufacturer that, when it is properly dried, there will be no detrimental effect. Any electrode, which has part of its flux coating broken away or is otherwise damaged, shall be rejected. Any electrode /wires/ flux older than six (6) months from the date of manufacture shall not be used. Batch certificates for electrodes/ wires /flux shall be submitted by the Contractor.

Preparation of Joints

1. The edges shall be prepared, with an automatically controlled flame cutting torch, correctly to the shape, size and dimensions of the groove, prescribed in the design and fabrication drawings. In case of U-groove joints, the edges shall be prepared with an automatic false cutting torch in two phases, following a bevel out with a gouging pass, or by machining.
2. The welding surfaces shall be smooth, uniform and free from fins, tears, notches or any other defects, which may adversely affect welding, and shall be free of loose scale, slag, rust, grease, paint, moisture or any other foreign material.

Welding Procedure

1. All welding procedures shall be submitted to the Engineer-in-charge for approval, well before starting fabrication.
2. The welding procedures shall be arranged by the Contractor to suit the details of the joints, as indicated in the drawings, and the position at which welding has to be carried out. Welding procedure shall cover the following:
 - a. Type and size of electrodes
 - b. Current and (for automatic submerged arc welding) arc voltage
 - c. Length of run per electrode; or (for automatic welding) speed of travel
 - d. Number and arrangement of runs in multi run welds
 - e. Position of welding
 - f. Preparation and set-up of parts
 - g. Welding sequence
 - h. Pre or post heating
 - i. Any other relevant information.
3. The welding procedures shall be so arranged that distortion and shrinkage stresses are reduced to the minimum.
4. Any weld found defective shall be removed, by using either chipping hammer or gouging torch, in such a manner that parent material is not injured in any way.
5. Welding shall not be carried out when temperature is below 10 degrees Celsius or surface is wet or during periods of strong winds unless the work and the welder is adequately protected.

Fusion Faces and Surrounding Surfaces

1. Fusion faces and the surrounding surfaces within 50mm of the welds shall be free from all mill scale and free from oil, paint or any substance which might affect the quality of the welds or impede the quality/progress of welding. These shall be free from irregularities, which would interfere with the deposition of the specified size of weld or be the cause of defects.
2. All mill scale within 50mm of welds shall be removed prior to welding, either by pickling followed by thorough power wire brushing, or by other approved methods.
3. If preparation or cutting of the fusion faces is necessary, the same shall be carried out by shearing, chipping, gas cutting or flame gouging.
4. Where hand gas cutting or hand gouging is employed, the blowpipe or gouging blowpipe shall be properly guided.

Assembly for Welding

Parts to be welded shall be properly assembled and held firmly in position by means of jigs and clamps prior to and during welding.

Plate Construction

Automatic metal arc welding shall be employed for fabrication of all members. Metal Inert gas welding may be done for short length where access to the location of the weld does not permit metal arc welding subject to approval of Engineer-in-charge.

Accuracy of Fit-Up

Parts to be fillet welded shall be brought into as close contact as practicable, and the gap due to faulty workmanship or incorrect fit-up shall not exceed 1.5mm. If greater separation occurs at any position, the size of fillet weld shall be increased at such positions by the amount of the gap.

Jigs and Manipulators

Jigs and manipulators shall be used, where practicable, and shall be designed to facilitate welding and to ensure that all welds are easily accessible to the operators.

Ends of Butt Welded Joints

The ends of butt joints shall be welded so as to provide full throat thickness. This may be done by the use of extension pieces, cross-runs or other approved means.

Weld Face and Reinforcement of Butt welds

The weld face shall, at all places, be deposited projecting the surface of the parent metal. Where a flush surface is required, the surplus metal shall be dressed off.

Testing of Butt Welds

Butt-welded joints are to be 25% radio graphically tested (or Phased Array ultrasonic Testing) by the Contractor at his own cost in the presence of the engineer in charge or his authorized representative, if desired by the engineer in charge. If such tests indicate the joints to be defective, the cost of rectification of defective welds shall also be borne by the Contractor. The agency for testing of welds shall be specified for approval by engineer-in-charge.

Minimum Leg Length & Throat Thickness in Fillet Welds

The minimum leg length of a fillet weld as deposited shall be not less than the specified size as per codal provisions. In no case shall a concave weld be deposited, unless specifically permitted. Where permitted, the leg length shall be increased above that specified length, so that the resultant throat thickness is as great as would have been obtained by the deposition of a flat-faced weld of the specified leg length.

Dislodging

After making each run of welding, all slag shall be thoroughly removed and the surface cleaned.

Quality of Welds

The weld metal, as deposited (including tack welds), shall be free from-cracks, slag inclusions, porosity, cavities and other deposition faults. The weld metal shall be properly fused with the parent metal without under cutting or overlapping at the toes of the weld. The surface of the weld shall have a uniform consistent contour and regular appearance.

Weather Conditions

Welding shall not be done under weather conditions, which might adversely affect the efficiency of welding.

Qualification and Testing of Welders

The Contractor shall satisfy the Engineer-in-charge that the welders are suitable for the work for which they will be employed, and shall produce evidence to the effect that welders, have satisfactorily completed appropriate tests, as described in IS:817 Part I. The Engineer-in-charge may, at his own discretion, order periodic tests of the welders and/or of the welds produced by them. Such tests shall be at the expense of the Contractor.

Supervision

The Contractor shall employ competent welding supervisors to ensure that the standard of workmanship and the quality of the materials comply with the requirements laid down in this document.

Machining of Butts and Bases

Splices and butt joints of compression members, depending on contact for stress transmission, shall be accurately machined over the whole section. In column bases, the ends of shafts together with the attached gussets, angles, channels etc., after bolting and/or welding together as the case may be, shall be accurately machined so that the parts connected butt over the entire surface of contact. Care shall be taken that connecting angles or channels are fixed with such accuracy that they are not reduced in thickness by machining by more than 0.8mm.

Requirement of Welded Joints

Apart from the requirements of welding specified under the above sub clauses, sections above, the Contractor shall ensure the following requirements in the welded joints.

- i) Strength-quality with parent metal.
- ii) Absence of defects
- iii) Corrosion resistance of the weld shall not be less than that of parent material in an aggressive environment.

Studs

Studs (if shown on the drawings) shall be used at interface of in-situ deck slab and its supporting plate beam to transfer the longitudinal shear. Unless otherwise specified the material used shall have characteristic yield strength of 385 MPa, minimum elongation of 18% and characteristic tensile strength of 495 Mpa.

Welding of stud shear connectors

Unless otherwise provided the stud shear connectors shall be fusion welded to the plate girder using stud welding machine as per the manufacturer's instructions. No other type of welding shall be permitted.

The stud and the surface to which studs are welded shall be free from scale, moisture, rust and other foreign material. The stud base shall not be painted, galvanized or cadmium plated prior to welding.

Welding shall not be carried out when temperature is below 10 degrees Celsius or surface is wet or during periods of strong winds unless the work and the welder is adequately protected.

The welds shall be visually free from cracks and shall be capable of developing at least the nominal ultimate strength of studs.

The procedural trial for welding the stud shall be carried out when specified by the Engineer-in-charge.

Shop Assembly

1. The steelwork shall be temporarily shop assembled, as necessary, so that the accuracy of fit may be checked before dispatch. The parts shall be shop assembled with a sufficient number of parallel drifts to bring and keep the parts in place
2. Since parts drilled or punched, with templates having steel bushes shall be similar and, as such, interchangeable, such steelwork may be shop erected in part only, as agreed by the Engineer-in-charge.

Erection Marking

1. Each fabricated member, whether assembled prior to dispatch or not so assembled, shall bear an erection mark, which will help to identify the member and its position in respect of the whole structure, to facilitate re-erection at site.
2. These erection marks shall be suitably incorporated in the shop detail and erection drawings.

FIELD INSPECTIONS

Field inspections shall be done as per clause 1905.7 of MORTH Specification- 2001.

STRUCTURAL STEEL WORK - QUALITY CONTROL & TESTING REQUIREMENTS

General

Scope of Specification

The scope of work of these specifications is to establish the norms for ensuring the required Quality Control through established testing norms of the welded structural steelwork by Engineer-in-charge.

Codes / Standards

Tests and Standards of Acceptance:

The materials shall be tested in accordance with relevant IS specifications and necessary test certificates shall be furnished. The cost of these tests shall be borne by the contractor. Additional tests if required by the engineer in charge shall be got carried out from the approved testing laboratory. The cost of such additional tests shall be borne by the contractor if the test indicates failure and shall be borne by the department if the test indicates all satisfactory results.

The fabrication, furnishing, erecting and painting of structural steel work shall be in accordance with these specifications.

Submittals

The Contractor shall submit the following:

- Proposed overall schedule for documentation of shop drawings, plan/procedures and records, procurement of materials from approved suppliers, submission of procedure of fabrication and erection.
- The contractor shall himself inspect all materials and shop work to satisfy the specified tolerance limits and Quality norms before the same are inspected by Engineer-in-charge or his authorized representative.

Field Inspection

General

All materials, equipment and work of erection shall be subject to the inspection of the Engineer in charge who shall be provided with all facilities including labour and tools required at all reasonable times. Any work found defective is liable to be rejected.

No protective treatment shall be applied to the work until the appropriate inspection and testing has been carried out. The stage inspection shall be carried out for all operations so as to ensure the correctness of fabrication and good quality. Structural member dimensions and camber, if any, shall not be finally checked until all welding and heating operations are completed and the member has cooled to a uniform temperature.

Testing of material

Structural steel shall be tested for mechanical and chemical properties as per various IS codes as may be applicable and shall conform to requirements specified in IS:226, IS:2062, IS:11587, IS:1977, IS:8500 and IS:961 etc.

Rivets, bolts, nuts, washers, welding consumables, steel forging, casting and stainless steel shall be tested for mechanical and chemical properties in the appropriate IS Code.

Rolling and cutting tolerance shall be as per IS: 1852. The thickness check measurements for the plate and rolled sections shall be taken at not less than 15 mm from edge.

For plates thicker than 25mm, Check for laminations in plates shall be carried out by ultra-sonic testing or any other specified methods.

Steelwork shall be inspected for surface defects and exposed edge laminations during fabrication and blast cleaning. Significant edge laminations found shall be reported to the Engineer in charge for his decision.

Chipping, grinding, machining or ultrasonic testing shall be used to determine depth of imperfection.

Bolted connections:

Bolts and bolted connection joints with high strength bolts shall be inspected and tested according to IS: 4000. The alignment of plates at all bolted splice joints and welded butt joints shall be checked for compliance with codal requirements.

Welding and welding consumables:

Welding procedure, welded connection and testing shall be in compliance with codal requirements. All facilities necessary for stage inspection during welding and on completion shall be provided to the Engineer in Charge or his authorized representatives.

Adequate means of identification either by identification mark or other record shall be provided to enable each weld to be traced to the welder(s) by whom it was carried out.

Execution

Tolerances

The contractor shall through appropriate planning and continuous measurements in the workshop and the erection at site, ensure that the tolerance specified below are strictly adhered to.

Tolerances in dimensions of components of fabricated structural steel work shall be specified on the drawings and shall be subject to the approval of the Engineer before fabrication. Unless specified, all parts of an assembly shall fit together accurately within tolerances specified in Table 1900-2 of MORT&H specifications.

A machined bearing surface, where specified by the Engineer, shall be machined within a deviation of 0.25 mm for surfaces that can be inscribed within a square of side 0.5 m.

INDIVIDUAL COMPONENTS

| | |
|--|---|
| 1. Length | |
| (a) Member with both ends finished for contact bearings | ± 1 mm |
| (b) Individual components of members with end plate connection | + 0 mm -2 mm |
| (c) Other members | |
| (i) Upto and including 12 M | ± 2 mm |
| (ii) Over 12 M | ± 3.5 mm |
| 2. Width | |
| (a) Width of built-up girders | ± 3 mm |
| (b) Deviation in the width of members required to be inserted in other members | + 0 mm -3 mm |
| 3. Depth | |
| Deviation in the depths of solid | +3 mm |
| Web and open web girders | -2 mm |
| 4. Straightness | |
| (a) Deviation from straightness of columns | L/3000 subject to a maximum of 15 mm where L is length of |

| | |
|--|---|
| <p>(i) In elevation</p> <p>(ii) In plan</p> <p>5. Deviation of centre line of web from centre line of flange in built-up member at contact surface</p> <p>6. Deviation from flatness of plate of web of built-up members in a length equal to the depth of the member</p> | <p>member +5 mm -0 mm</p> <p>L/1000 subject to a maximum of 10 mm</p> <p>3 mm</p> <p>0.005 d to a maximum of 2 mm where d is depth of the member</p> |
| <p>7. Tilt of flange of plate girders</p> <p>a) At splices and stiffeners, at support, at the top flanges of plate girders and at bearings</p> <p>b) at other places</p> <p>8. Deviation from squareness of flange to web of columns and Box girders</p> <p>9. Deviation from squareness of fixed base plate (not machined) to axis of column. This dimension shall be measured parallel to the longitudinal axis of the column at points where the outer surfaces of the column sections make contact with the base plate</p> <p>10. Deviation from squareness of machined ends to axes of columns</p> <p>11. Deviation from squareness of machined ends to axes of beams or girder</p> <p>12. Ends of members abutting at joints through cleats or end plates, permissible deviation from squareness of ends</p> | <p>0.005 b to a minimum of 2 mm where b is width of the member</p> <p>0.015 b to a maximum of 4 mm where b is width of the member</p> <p>L/1000, where L is nominal length of the diagonal</p> <p>D/500, where D is the distance from the column axis to the point under consideration on the base plate</p> <p>D/1000, where D is as defined in 9 above</p> <p>D/1000, where D is as defined in 9 above</p> <p>1/600 of depth of member subject to a maximum of 1.5 mm</p> |

Dimensional & Weight Tolerance

The dimensional and weight tolerance for rolled shapes shall be in accordance with IS: 1852, 808 etc. The acceptable limits of straightness for rolled or fabricated members as per IS: 7215

Quality Control:

The steel shall comply in all respects with the requirements of approved drawings and relevant codes and specifications and shall be procured from approved manufacturers only. It may be noted that quality of raw steel used for fabrication shall be essence of the contract & shall be strictly conforming to specified standard. Steel sections to be supplied by the manufacturers shall be tested as per codal provisions at the manufacturer's premises before dispatch. The contractor on receipt of supply in his approved fabrication shop shall carry out necessary control tests including ultrasonic testing as per codal requirements and verify them with the list received from manufacturers. The rejected lot shall not be used and rejected lot shall be immediately removed from fabrication shop. Only steel passed in all tests as per codal requirement shall be used for fabrication.

The contractor shall supply information in the technical package regarding source / manufacturers from where procurement of steel is proposed.

In order to exercise proper control of the quality of the welding, Contractor shall enforce methods of control as tabulated below:

| Purpose | Control subjects | Methods of control |
|---|---|---|
| 1 | 2 | 3 |
| 1. Control of welding materials and basic metal quality | Quality control of electrodes, welding wire, flux and protective gases Checking of quality and Weldability of the basic metal and welded members | Weldability test to determine the technological properties of materials. Mechanical test of weld metal Metallographical investigations of welds macro-structure and microstructure Checking of weld metal resistance for intercrystalline corrosion. Study if weld metal solidity by physical control methods. |
| 2. Checking of welders qualifications | Welding of specimens for quality determination | Mechanical tests, metallographical investigation & checking of welded joints by physical control methods |

| Purpose | Control subjects | Methods of control |
|------------------------------------|--|---|
| 1 | 2 | 3 |
| 3. Control of welded joint quality | Control of assembly accuracy and technological welding process | <p>Checking of assembly quality & centering of welded members</p> <p>Checking of welding equipment conditions. Checking correctness of welding procedure. Visual examination of welds</p> |

7.26.2.1 Tests & Testing Procedures

Fabricator agency shall have in house facilities for all testing of weld, as detailed in this tender document.

Visual Examination

The contractor shall conduct visual examination and measurement of the external dimensions of the weld for all joints. Before examining the welded joints, areas close to it on both sides of the weld for a width not less than 20 mm shall be cleaned of slag and other impurities. Examination shall be done by a magnifying glass which has a magnification power of ten (10) and measuring instrument which has an accuracy of ± 0.1 mm or by weld gauges. Welded joints shall be examined from both sides. The contractor shall examine the following during the visual checks.

- i) Correctness and shape of the welded joints
- ii) Incomplete penetration of weld metal.
- iii) Influx
- iv) Burns
- v) Unwelded craters
- vi) Undercuts
- vii) Cracks in welded spots and heat affected zones
- viii) Porosity in welds and spot welds
- ix) Compression in welded joints as a result of electrode impact while carrying out contact welding
- x) Displacement of welded element

The contractor shall, document all data as per sound practices.

Mechanical Test

The Contractor shall carry out various mechanical tests to determine weldability, metal alloyability, nature of break, correct size and type of electrodes, degree of pre-heat and post-heat treatment. The type, scope and sample of various mechanical tests shall be determined in agreement with the purchaser. The number of tests conducted shall depend on the result obtained to satisfy the Engineer-in-charge that the correct type and size of electrode, degree of pre-heating and post-heating and weldability of metal are being followed.

Dye Penetration Test

All welds shall be tested by “Dye Penetration test” as per current practices.

Radiography Test

Radiography test shall be conducted by the contractor to determine gas inclusion (blow holes, hollows) slag inclusion, shallow welds and cracks for 25% lengths all butt joints.

Before conducting the examination the welded joints shall be cleaned of slag and scales and visually examined. The welds shall be marked into separate portions depending on the length of photograph. The length of photograph shall be such as to ensure that there are no distortions and shall reveal the defect correctly. The length shall not be more than 0.75 of the focal distance and the width of the photograph would depend on the width of the welded joint plus 20 mm on either side of the weld. The cassette with film shall be protected by sheet of lead or equivalent of proper thickness against incidental, diffused and secondary radiation.

The direction of the ray with relation to the film shall be as specified hereunder.

Welds of butt joints without edge slopes with edge processing shall be examined by central ray directed at right angles to the weld.

In special cases examination of welds with inclined rays directed along edge slopes may be permitted by the Engineer-in-charge.

Lap joints shall be examined by directing rays at 45 degree to the bottom plate. Welds in T-joints without any edge preparation shall be examined by rays directed at 45 degree to the weld. Angle welds in lap and tee-joints shall be examined by the rays in opposite direction i.e. the film will be on the side of the weld. Weld in angle joints shall be checked by directing ray along the bisector of the angle between the welded elements. Opposite direction of the ray and location of the film may also be permitted by the Employer.

For detail testing method refer relevant IS codes.

Phased Array Ultrasonic Test

This test shall be conducted at the discretion of the engineer in charge if the Radiography Test is waived off by the engineer in charge.

For detail testing method refer relevant IS codes.

Ultrasonic Test

Ultrasonic test shall be conducted by the contractor to detect gas inclusion (pores), slag inclusion, shallow welds, cracks, lamination and friability etc. Prior to starting of ultrasonic test the welded joint shall be thoroughly cleaned of slag and other material. Surface of the basic metal adjacent to welded joint on both sides shall be mechanically cleaned by the grinder or a metal brush to provide the contact of the whole ultrasonic probe surface with surface of basic metal. The width of the clean surface shall be as directed by the Engineer-in-charge. The

welded joint then shall be covered with a thin coat of transformer oil, turbine or machine oil to ensure acoustic contact. The joints so treated shall be marked and the marks shall be entered into the documentation, subsequent to this, ultrasonic test shall be carried out as directed by the Engineer-in-charge. At least 50% of weld shall be tested by ultrasonic testing. For detail testing method refer relevant IS codes.

Erection of Steel Structures

General

Scope of Specification

The scope of work of these specifications is to establish the norms for ensuring the required safety procedures methods etc. for erection of steel structures.

Submittals

The methodology shall be submitted by contractor for approval by Engineer-in-charge well before the arrival of material for erection.

Erection

General

The Contractor shall erect the structural steel, remove the temporary construction, and do all the work required to complete the, construction included in the contract in accordance with the drawings and the specifications and to the entire satisfaction of the Engineer.

Organisation and Equipment

The Contractor shall submit erection plans prepared by the fabricator, showing a method and procedure of erection, compatible with the details of fabrication.

A detailed scheme must be prepared showing stage-wise activities, with complete drawings and working phase-wise instructions. This should be based on detailed stagewise calculation and take into account specifications and capacity of erection equipment machinery, tools, tackles to be used and temporary working loads as per Codal provisions.

The scheme should be based on site conditions e.g. hydrology, rainfall intensity, soil and sub-soil conditions, temperature and climatic conditions and available working space, etc.

The scheme should indicate precisely the type of temporary fasteners to be used as also the minimum percentage of permanent fasteners to be fitted during the stage erection. The working drawings should give clearly the temporary jigs, fixtures, clamps, spacer supports, etc.

The contractor shall supply and erect all necessary false work and staging and shall supply all labour, tools, erection plant and other materials necessary to carry out the work complete in all respects.

The Contractor shall supply all bolts, nuts, washers, etc. required to complete erection at site with an allowance for wastage, etc., of 10% or a minimum of five number of each item.

Prior to actual commencement of erection all equipment, machinery, tools, tackles, ropes, etc. need to be tested to ensure their efficient working. Frequent visual inspection is essential in vulnerable areas to detect displacements, distress, drainages, etc.

Deflection and vibratory tests shall be conducted in respect of supporting structures, launching truss, cranes etc. as also the structure under erection and unusual observations reviewed, looseness of fittings are to be noted.

For welded structures, welders' qualifications and skill are to be checked as per standard norms. Non-destructive tests of joints as per Engineer in charge's directives are to be carried out.

Precision non-destructive testing instruments available in the market should be used for noting various important parameters of the structures frequently and systematic record is to be kept.

Safety requirements should conform to IS:7205, IS:7273 and IS:7269 as applicable and should be a consideration of safety, economy and rapidity.

Erection work should start with complete resources mobilised as per latest approved drawings and after a thorough survey of foundations and other related structural work. In case of work of magnitude, maximum mechanisation is to be adopted.

The structure should be divided into erectable modules as per the scheme. This should be pre-assembled in a suitable yard/platform and its matching with members of the adjacent module checked by trial assembly before erection.

The structure shall be set out to the required lines and levels. The stocks and masses are to be carefully preserved. The steelwork should be erected, adjusted and completed in the required position to the specified line and levels with sufficient drifts and bolts. Packing materials are to be available to maintain this condition. Organised "Quality Surveillance" checks need to be exercised frequently.

Before starting work, the Contractor shall obtain necessary approval of the Engineer as to the method adopted for erection, the number and character of tools and plants. The approval of the Engineer shall not relieve the Contractor of his responsibility for the safety of his method or equipment or from carrying out the work fully in accordance with the drawings and specifications.

During the progress of work, the Contractor shall have a competent Engineer or foreman in charge of the work, who shall be adequately experienced in steel erection and acceptable to the Engineer in Charge.

Handling and Storing of Materials

Suitable area for storage of structures and components shall be located near the site of work. The access road should be free from water logging during the working period and the storage area should be on levelled and firm ground.

The store should be provided with adequate handling equipments e.g. road mobile crane, gantries, derricks, chain pulley blocks, winch of capacity as required. Stacking area should be planned and have racks, stands sleeper, access tracks, etc., and properly lighted.

Storage should be planned to suit erection work sequence and avoid damage or distortion. Excessively rusted, bent or damaged steel shall be rejected. Methods of storage and handling steel, whether fabricated or not shall be subject to the approval of the Engineer in charge.

Fabricated materials are to be stored with erection marks visible, such as not to come into contact with earth surface or water and should be accessible to handling equipment.

Small fitting hand tools are to be kept in containers in covered stores.

All materials, consumables, including raw steel or fabricated material shall be stored specification-wise and size-wise above the ground upon platforms, skids or other supports. It shall be kept free from dirt and other foreign matter and shall be protected as far as possible from corrosion and distortion. The electrodes shall be stored specification-wise and shall be kept in dry warm condition in properly designed racks. The bolts, nuts, washers and other fasteners shall be stored on racks above the ground with protective oil coating in gunny bags. The paint shall be stored under cover in air-tight containers.

IS:7293 and IS:7969 dealing with handling of materials and equipments for safe working should be followed. Safety nuts and bolts as directed are to be used while working. The Contractor shall be held responsible for loss or damage to any material provided by the Department while in his care or for any damage to such material resulting from his work.

Formwork

The formwork shall be properly designed, substantially built and maintained for all anticipated loads. The Contractor, if required, shall submit plans for approval to the Engineer in Charge. Approval of the plans, however, shall not relieve the Contractor of his responsibility.

Straightening Bent Material

The straightening of plates, angles and other shapes shall be done by methods not likely to produce fracture or any injury. The metal shall not be heated unless permitted by the Engineer for special cases, when the heating shall not be to a temperature higher than that producing a dark "cherry red" colour, followed by as slow cooling as possible. Following the straightening of a bend or buckle the surface shall be carefully investigated for evidence of fracture. Sharp kinks and bends may be the cause for rejection of material.

Assembling Steel

The parts shall be accurately assembled as shown on the drawings and match marks shall be followed. The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged.

Hammering which will injure or distort the members shall not be done. Bearing surface or surfaces to be in permanent contact shall be cleaned, before the members are assembled. The truss spans shall be erected on blocking, so placed as to give the proper camber. The blocking shall be left in place until the tendon chord splices are fully riveted and all other truss connections pinned and bolted. Bolts in splices of butt joints of compression members and bolts in railings shall not be driven until the span has been swung.

All joint surface for bolted connections including bolts, nuts, washers shall be free from scale, dirt, burrs, other foreign materials and defects that would prevent solid seating of parts. The slope of surface of bolted parts in contact with bolt head and nut shall not exceed 1 in 20, plane normal to bolt axis, otherwise suitable tapered washer shall be used.

All fasteners shall have a washer under nut or bolt head whichever is turned in tightening.

Any connection to be bolted shall be secured in close contact with service bolts or with a sufficient number of permanent bolts before the rivets are driven or before the connections are finally bolted. Joints shall normally be made by filling not less than 50 percent of holes with service bolts and barrel drifts in the ratio 4:1. The service bolts are to be fully tightened up as soon as the joint is assembled. Connections to be made by close tolerance bolts shall be completed as soon as practicable after assembly.

Transportation & Handling

- A. Before the shop assembling is dismantled, all members and sections shall be appropriately marked with paint or grooved with their identification numbers as detailed in shop drawings.
- B. The Contractor shall transport the fabricated structural steel materials to work site, with all necessary field connection materials, in such sequence as will permit the most efficient and economical performance of the erection work. As per scheduled programme, the Engineer-in-charge may, at his discretion prescribe or control the sequence of delivery of materials.
- C. Fabricated parts shall be handled in such a way-that no damage is caused to the components. Measures shall be taken to minimize damage to the protective treatment on the steelwork. All work shall be protected from damage in transit. Particular care shall be taken to stiffen free ends, prevent permanent distortion and adequately protect all machined surfaces. All bolts, nuts, washers, screws, small plates and articles generally shall be suitably packed and identified.

Field Bolts

1. Field bolts nuts and washers shall be furnished by the Contractor in excess of the nominal numbers required. He shall supply the full number of bolts, nuts and washers and other necessary fittings required completing the work, together with the additional bolts, nuts and washers totaling to 10% of the requirement subject to minimum of 10 Nos. Only structural bolts of class 8.8 shall be used.
2. At the time of assembly, the surfaces in contact shall be free of paint or any other applied finish, oil, dirt, loose rust, loose scale, burrs and other defects which would prevent solid seating of the parts or would interfere with the development of friction between them.

- 3 If any other surface condition, including a machined surface, is specified, it shall be the responsibility of the Contractor to work within the slip factor specified for the particular case.
- 4 Each bolt and nut shall be assembled with washers of appropriate shape, quality and number in cases where plane parallel surfaces are involved. Such washers shall be placed under the bolt head or the nut, whichever is to be rotated during the tightening operation. The rotated nut or bolt head shall be tightened against a surface normal to the bolt axis, and the appropriate tapered washer shall be used when the surfaces are not parallel. The angle between the bolt axis and the surface under the non-rotating component (i.e. the bolt head or the nut) shall be $90 + 3$ degree. For angles outside these limits, a tapered washer shall be placed under the non-rotating component. Tapered washers shall be correctly positioned.
- 5 No gasket or other flexible material shall be placed between the holes. The holes in parts to be joined shall be sufficiently well aligned to permit bolts to be freely placed in position. Driving of bolts is not permitted. The nuts shall be placed so that the identification marks are clearly visible after tightening. Nut and bolts shall always be tightened in a staggered pattern and where there are more than four bolts in any one joint, they shall be tightened from the centre of the joint outwards.
- 6 If, after final tightening, a nut or bolt is slackened off for any reason, the bolt, nut and washer or washers shall be discarded and not used again.

Tightening of bolts

Bolted connection joints with high strength friction grip bolts shall be inspected for compliance of codal requirements.

The Engineer shall observe the installation and tightening of bolts to ensure that correct tightening procedure is used and shall determine that all bolts are tightened. Regardless of tightening method used, tightening of bolts in a joint should commence at the most rigidly fixed or stiffest point and progress towards the free edges, both in initial snugging and in final tightening.

The tightness of bolts in connection shall be checked by inspection wrench, which can be torque wrench, power wrench or calibrated wrench. Tightness of 10 per cent bolts, but not less than two bolts, selected at random in each connection shall be checked by applying inspection torque. If no nut or bolt head is turned by this application, connection can be accepted as properly tightened, but if any nut or head has turned all bolts shall be checked and, if necessary, re-tightened.

Painting at Site

Surfaces which will be inaccessible after site assembly shall receive the full specified protective treatment before assembly. Surfaces which will be in contact after site assembly shall receive a coat of paint (in addition to any shop primer) and shall be brought together while the paint is still wet. Damaged or deteriorated paint surfaces shall be first made good with the same type of coat as the shop coat. Where steel has received a metal coating in the shop, this coating shall be completed on site so as to be continuous over any welds, bolts and site rivets. Specified protective final painting treatment shall be completed after erection.

Rate

The unit rate shall include following but not limited to:

- (i) Preparation and getting approval of complete detailed fabrication drawings based on the design drawings, required for all permanent structures including incorporating the connection details of temporary structure. Preparation of details for alternative sections/ any modifications in design drawings. Furnishing required numbers of sets of drawings as an advance (for approval) and final execution drawings.
- (ii) Procurement of all raw steel materials including plates & other sections, HSG bolts nuts, washer, shear connector, electrodes / wires /flux including its testing, allowance for all types of wastages, temporary works, shuttering, staging, temporary bolts etc. and all incidentals required to complete the job as per drawings and specifications and as per instructions of Engineer-in-Charge. All rolling tolerances shall be within the specified limits as per codal provisions. Any material with weight lesser than the allowable tolerance limit will not be acceptable. Payment for overweight materials shall be restricted to the theoretical weight of the material, provided the same is within permissible tolerance limit.
- (iii) Complete fabrication and its testing including shop assembling.
- (iv) Loading, transportation and unloading of fabricated parts and field connection materials etc to site storage yard or erection site.
- (v) Erection and installation in final position including all site splicing, bolting, etc. including all tools, machinery, equipments required to complete the job.

Measurements for Payment

The payment for the steelwork (for E350 grade of steel work) will be for the weight of the steelwork which will be actually erected and used as permanent work, i.e. plates, splice plates, gusset plates, insert plates, stiffeners, rolled sections, bracing etc (including weight of all high strength bolts, nuts & washers required for intermediate and end connections and shear connectors/studs).

Dimensions of the steelwork will be taken from the approved shop drawings as prepared by the contractor based on design drawings. For structural sections the weight will be calculated on lengths actually used with no deduction for splay cut or mitered end. Gusset plates shall be calculated for nearest rectangle or square section weight. No deduction shall be made for bolt holes. The weight of steel sheet and strips shall be taken from relevant Indian Standards based on 7.85 kg/m² for every millimeter sheet thickness. For rolled sections, steel rods and steel strips, weight given in relevant Indian Standards shall be used.

The length measurements shall be made using steel tapes or other device properly calibrated with measurement upto 1mm. The standard weight of steel sections shall conform to IS 808 with tolerance in sizes as per IS 1852. Tolerance in weight is given in Table 10.3 CPWD specifications. Steel sections shall be acceptable within tolerance limits. Payment for steel sections shall be made as per actual weight within tolerances. Sections having weight on higher side than permissible tolerance, may be acceptable but payment shall be made on the basis of standard weight only. Steel sections having weight variations lower than permissible variation shall not be acceptable.

The weight of steel plates and other sections shall be determined from the dimensions shown on the drawings on the following basis:

- Steel Plates: 7.85×10^3 kg/cum
- Rolled Sections: As per IS:808-1989
- SHS/RHS sections: As per IS:4923
- Tubes : IS1161-1979

Weight of structural sections shall be nominal weight as per IS:Codes. Weight of weld fillets and the weight of protective coatings shall not be included.

The measurement and payment for the steelwork (for E250 grade of steel work) shall be made separately as per appropriate applicable item and CPWD specifications.

PERFORMA: G1**GUARANTEE BOND TO BE EXECUTED BY CONTRACTORS FOR REMOVAL OF DEFECTS
AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS**

The Agreement made thisday of two thousand and between..... son of of (hereinafter called the Guarantor of the one part) and the Board of Governors, IIT Kanpur (hereinafter called Government of the other part).

WHEREAS this agreement is supplementary to a contract (hereinafter called the Contract) dated..... and made between the GUARANTOR of the one part and the Government of the other part, whereby the Contractor, inter alia, undertook to render the buildings and structures in the said contract recited completely water and leak-proof.

AND WHEREAS GUARANTOR agreed to give a guarantee to the effect that the said structures will remain water and leak-proof for five years from the date of giving of water proofing treatment.

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

Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose:

- (a) Misuse of roof shall mean any operation which will damage proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof;
- (b) Alteration shall mean construction of an additional storey or a part of the roof or Construction adjoining to existing roof whereby proofing treatment is removed in parts;
- (c) The decision of the Engineer-in-Charge with regard to cause of leakage shall be final. During this period of guarantee the guarantor shall make good all defects and in case of any defect being found, render the building water-proof to the satisfaction of the Engineer-in-Charge at his cost, and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-Charge calling upon him to rectify the defects, failing which the work shall be got done by the Department by some other contractor at the GUARANTOR'S cost and risk. The decision of the Engineer-in-Charge as to the cost, payable by the Guarantor shall be final and binding.

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

IN WITNESS WHEREOF these presents have been executed by the Obligorand by..... and for and on behalf of the Board of Governors, IIT Kanpur on the day, month and year first above written.

Signed, sealed and delivered by OBLIGOR in the presence of—

- 1.
- 2.

Signed for and on behalf of THE Board of Governors, IIT Kanpur by In the presence of—

- 1.
- 2.

PERFORMA: G2

GUARANTEE BOND FOR ANTITERMITE TREATMENT

(For Guarantee to be executed by contractors for removal of defects of anti termite treatment works after maintenance period)

This agreement made this _____ day of _____ between _____ M/s. _____ (hereinafter called "the Guarantor of the one part) and the Board of Governors, IIT Kanpur (hereinafter called "the Government"of the other part.)

Whereas this agreement is supplementary to the contract (hereinafter called "the Contract") dated _____ made between the Guarantor of the one part and Government of the other part, whereby the Contractor, inter-alia, undertook to render the buildings and structure in the said contract recited, completely termite proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said structure will remain termite proof for **Five years** to be reckoned from the date after the maintenance period prescribed in the contract expires.

NOW THE GUARANTOR hereby guarantees that the anti-termite treatment provided by him will render the structures completely termite proof and the minimum life of such anti-termite treatment shall be ten years to be reckoned from the date of after the maintenance period prescribed in the contract expires.

Provided that the Guarantor will not be responsible for damages caused due to structural defects or misuse of premises/area.

a) Misuse of premises shall mean any operation which will disturb the chemical barrier like excavation under floors, breaking of walls at G.L. disturbing the treatment already carried out.

The decision of the Engineer-in-Charge with regard to cause of damage shall be final.

During this period of guarantee the guarantor shall make all the arrangements to do the post constructional anti-termite treatment in all the buildings in case of any termite nuisance being found in the building, to the satisfaction of the Engineer-in-Charge at the cost of guarantor and shall commence the work for such treatment within **seven days** from the date of calling upon him to rectify the defects, by the Engineer-in-Charge, failing which the work shall be got done by the Department by some other contractor at the GUARANTOR'S COST and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the Guarantor fails to execute the anti-termite treatment or commits breaches hereunder then the Guarantor will indemnify the principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by the Department by reason of any default on the part of the GUARANTOR in performance and observance of this supplemental agreement. As to the amount of loss and/or damage and/or cost incurred by the Government, the decision of the Engineer-in-Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligor _____ and by _____ and for and on behalf of the Board of Governors, IIT Kanpur on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGOR in the presence of :

- 1.
- 2.

SIGNED FOR AND ON BEHALF OF THE BOARD OF GOVERNORS, IIT KANPUR BY

in the presence of:

- 1.

2.

PERFORMA: G3

**TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTSAFTER
COMPLETION IN RESPECT OF ALUMINIUM WORK, WINDOWS VENTILATORS,
STRUCTURAL GLAZING & STRUCTURAL STEEL WORKS**

The agreement made this _____ day of _____ Two Thousand and _____ between _____ son of _____ (hereinafter called the GURANTOR of the one part) and the Board of Governors, IIT Kanpur (hereinafter called the Government of the other part.)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the Government of the other part, whereby the contractor inter alia, undertook to render the work in the said contract recited structurally stable, leak proof and sound material, workmanship, anodizing, colouring, sealing.

AND WHEREAS THE GURANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable, leak proof and guaranteed against faulty material and workmanship, defective anodizing, colouring, sealing and finishing for **5 (Five) years** to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable, leak proof and guaranteed against faulty material and workmanship, defective anodizing, colouring, sealing and finishing for two years to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer-in-charge with regard to nature and cause of defects shall be final.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor’s risk and cost. The decision of the Engineer-in-Charge as to the cost, payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects or commits breach there under, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and/or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents, have been executed by the obligator _____ and _____ by _____ for and on behalf of the Board of Governors, IIT Kanpur on the day, month and year first above written. SIGNED, sealed and delivered by OBLIGATOR in the presence of:

- 1. _____
- 2. _____

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY _____ in the presence of:

- 1. _____
- 2. _____

PERFORMA: G4**TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER SUPPLY AND SANITARY INSTALLATIONS**

The agreement made this _____ day of _____ Two Thousand and _____ between _____ son of _____ (hereinafter called the GUARANTOR of the one part) and the Board of Governors, IIT Kanpur (hereinafter called the Government of the other part.)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the Government of the other part, whereby the contractor inter alia, undertook to render the work in the said contract recited structurally stable workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable and guaranteed against faulty workmanship, finishing, manufacturing defects of materials and leakages, etc.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable after expiry of maintenance period prescribed in the contract for the minimum life of **5 (Five) years** to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer-in-charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost, payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects commits breach thereunder, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents, have been executed by the obligator _____ and _____ by _____ for and on behalf of the Board of Governors, IIT Kanpur on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of:

1. _____ 2. _____
SIGNED FOR AND ON BEHALF OF THE BOARD OF GOVERNORS, IIT KANPUR BY _____ in the presence of:

1. _____ 2. _____

Form of Performance Security (Guarantee)

Bank Guarantee Bond

In consideration of the Board of Governors, IIT Kanpur (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between.....and (hereinafter called "the said Contractor(s)") for the work..... (hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs. (Rupees only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, (hereinafter referred to as "the Bank") hereby undertake to pay to the Government an amount not exceeding Rs. (Rupees..... Only) on demand by the Government.
2. We,(indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupeesonly)
3. We, the said bank further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.
4. We, (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in- Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.
5. We, (indicate the name of the Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Government or any

indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).
7. We, (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.
8. This guarantee shall be valid up tounless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated theday offor.....(indicate the name of the Bank)

- - Note - The Bank Guarantee shall be in favour of the Director, IIT Kanpur.

Form of Earnest Money Deposit

Bank Guarantee Bond

WHEREAS, contractor..... (Name of contractor) (hereinafter called "the contractor") has submitted his tender dated (date) for the construction of (name of work) (hereinafter called "the Tender")

KNOW ALL PEOPLE by these presents that we (name of bank) having our registered office at (hereinafter called "the Bank") are bound into (Name and on of Executive Engineer) (hereinafter called "the Engineer-in-Charge") in the sum of Rs. (Rs. in words) for which payment well and truly to be made to the said Engineer-in-Charge the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this day of 20... . THE CONDITIONS of this obligation are:

- (1) If after tender opening the Contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;
- (2) If the contractor having been notified of the acceptance of his tender by the Engineer-in-Charge:
 - (a) Fails or refuses to execute the Form of Agreement in accordance with the Instructions to contractor, if required;

OR

- (b) Fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and Instructions to contractor,

We undertake to pay to the Engineer-in-Charge either up to the above amount or part thereof upon receipt of his first written demand, without the Engineer-in-Charge having to substantiate his demand, provided that in his demand the Engineer-in-Charge will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date* after the deadline for submission of tender as such deadline is stated in the Instructions to contractor or as it may be extended by the Engineer-in-Charge, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE

SIGNATURE OF THE BANK

WITNESS

SEAL

(SIGNATURE, NAME AND ADDRESS)

*Date to be worked out on the basis of validity period of 4 months from last date of receipt of tender.

- Note - The Bank Guarantee shall be in favour of the Director, IIT Kanpur.

LIST OF PREFERRED MAKES FOR CIVIL WORKS

| | Material description | Approved Manufacturer / Brand Name |
|----|--|---|
| 1 | TMT bars – Fe 500D | SAIL, Tata Steel Ltd, RINL, Jindal Steel & Power Ltd, JSW Ltd |
| 2 | Structural Steel Plates/ISMB/Structural sections | TATA, SAIL, JSPL, JSW, RINL |
| 3 | Cement (PPC) | A.C.C., Jaypee Cement, Ultratech, Vikram, Shri cement, Ambuja, Century Cement & J.K. Cement |
| 4 | Ceramic/glazed Tiles | RAK, Johnson, Nitco, Kajaria of approved design, color and shade. |
| 5 | White Cement & white cement based putty | Birla White, J.K. White, or equivalent. |
| 6 | Primers, distemper, all types of paints (Low VOC) (i/c water proofing cement paint) etc but excluding fire resistant paint | Nerolac, Asian, Berger, ICI-Dulux |
| 7 | Roofing sheet of Zinalume | Tata Blue Scope, JSW, Kirby, Everest, Lloyds |
| 8 | Wash Basin and WC Pan & CP Brass fittings & accessories | As specified in item of schedule. When not specified then Jaquar, Kohler, Grohe, Roca. |
| 9 | Clear glass, float glass, heat reflective glass | Saint Gobain, ASAHI, Modi Guard, AIS/Glaverbel, Pilkington |
| 10 | G.I. pipes and accessories | Tata, Jindal-Hissar, Prakash Surya, NVR |
| 11 | Centrifugally Cast Iron Spun Pipes & fittings | NECO, HEPCO, SKF, RIF |
| 12 | Flush valves | As specified in item of schedule. When not specified then Jaquar, Kohler, Grohe, Kingston |
| 13 | Cement Admixture/Plasticizer | FOSROC, SIKKA, PIDILITE, CICO, BASF |
| 14 | Aluminium sections (Anodised/Powder coated by approved anodizing/powder coating firm) & | Hindalco, Jindal, Indian Aluminium Co., NALCO |

| | | |
|----|--|---|
| | hinges | |
| 15 | Water proofing compound | WEBER, FOSROC, Pidiproof, CICO, BASF,SIKA |
| 16 | Stainless steel sink | Neelkanth, Nirali, PRAYAG, Parryware |
| 17 | Particle board i/c laminated | BHUTAN, ECO BOARD, MERINO |
| 18 | Plywood/ Blockboard/ Ply Board | Greenply/Century/ Kitply/ Greenlam/ Novapan/ Marrino |
| 19 | Laminates | Century/ Greenlam/ Decolam/Jayna/ Merino / Kitply/ kutty |
| 20 | PVC tanks | Sintex, Plasto,Supreme,Astral |
| 21 | Mirrors | Saint Gobain, Modi Guard, AIS, Pilkington |
| 22 | Calcium Silicate Tiles | Hilux, Aerolite, Gyproc |
| 23 | Vitrified tiles Floor Tiles (Vitrified tiles to be doubly charged) | First quality of RAK, Johnson, Rustile, Nitco, Kajaria of approved design, color and shade. |
| 24 | Acrylic Exterior Paint | Asian Paint, Berger, ICI Dulux, Nerolac |
| 25 | AAC blocks | Max Blocks, Biltech, AEROCON, MAGICRETE, JK Lakshmi Cement Ltd., ECOLITE |
| 26 | Dash Fasteners/Anchor Fasteners | Hilti/ Fischer/ Bosch/ Canon |
| 27 | Anti - Termite Treatment | Osolin, ESSAR- CHLORO, DURSBAN, GIBRALTOR or Equivalent. |
| 28 | Adhesive For Door Work | Fevicol/Vamicol/Dunlop |
| 29 | Stainless Steel Hardware (other than fire rated) | Dorma,GEZE,Hafele,Guardian,Godrej |
| 30 | Flush Door Shutters | Greenply/Century/Kutty/Jayna/Kitply/National |
| 31 | Thermal insulation for water pipe | M/s Lloyd Insulations India Limited, Armacell, Thermaflex or equivalent |
| 32 | Thermal insulation/Rockwool/ glass wool/Mineral wool/Puf | Twiga, M/s Lloyd Insulations India Limited, equivalent |
| 33 | Deleted | Deleted |

| | | |
|----|---|--|
| 34 | Stainless Steel Friction/Spring Hinges | Ebco /Dorma/ Hettich/GEZE/Guardian |
| 35 | Deleted | Deleted |
| 36 | Gypsum False Ceiling/Gypsum board/tiles | India Gypsum/ Laffarge(LAGYP) / Saint Gobain (Gyproc) |
| 37 | Deleted | Deleted |
| 38 | Door Closer / Floor Spring | Dorma/GEZE/Hafele/Guardian |
| 39 | Glass Fibre Acoustical Tiles | Twiga/ Ecophon / Armstrong |
| 40 | Acoustical Wall And Ceiling System | Gyproc, USB boral, or Equivalent |
| 41 | UPVC pipes & fittings conforming to IS : 13592 | Supreme / Finolex / Kisan/Astral |
| 42 | Ductile iron pipes (IS:8329) | Electrosteel/Kesoram/Jindal/Tata |
| 43 | Ductile iron fittings (IS:9523) | Electrosteel/Kesoram/Jindal/ Tata Kartar |
| 44 | Gypsum Plaster | Gyproc, Ultratech, Ferrouscrete |
| 45 | CPVC pipes & fittings | Astral / Supreme/ Flow Guard |
| 46 | Deleted | Deleted |
| 47 | Deleted | Deleted |
| 48 | Hermetically sealed performance glass,Toughened glass, DGU,SGU, toughened laminated glass | Authorized Tougheners of (Modi Guard, Saint Gobain,ASAHI,AIS/Glaverbel,Pilkington) |
| 49 | Deleted | Deleted |
| 50 | EPDM Gasket | Hanu,Osaka,Alps |
| 51 | Deleted | Deleted |
| 52 | Deleted | Deleted |
| 53 | Crystalline water proofing admixture and compound | Penetron, Kryton, Pidilite, Fosroc |
| 54 | Floor Hardener | IRONITE,FERROK,HARDONATE |
| 55 | AAC blocks Adhesive/Tile adhesive | PIDILITE, BALENDURA, |

| | | |
|----|---|---|
| | | FERROUSCRETE,LATICRETE |
| 56 | Tile grouting compound | PIDILITE,BALENDURA,FERROUSCRETE,LATICRETE |
| 57 | Deleted | Deleted |
| 58 | Deleted | Deleted |
| 59 | Stoneware pipe & fittings/accessories | Perfect,Parry,Burn |
| 60 | Pressed steel door frames sheet | TATA,SAIL,JSW,JSPL,RINL |
| 61 | Gun metal valve/brass gate valve/Ball valve/Butterfly valve | Zoloto,Sant,Leader |
| 62 | Stainless Steel water supply Pipes | Jindal, Swastik, RAMPART |
| 63 | M.S. Pipe & tubes | Jindal/ Tata / TTSwastik |
| 64 | Galvanized steel plain sheets | TATA,Essar,Jindal |
| 65 | Malleable cast iron fittings | RKs / Unik / Zoloto |

NOTE: Equivalent material and finishes of any other specialized make may be used, in case it is established that the brands specified above are not available in the market but only after approval of the alternate brand by the Engineer-in-charge.

LIST OF DRAWINGS

The following drawings listed and placed in the bid documents are indicative only. The work shall be executed as per “Good for Construction (GFC)” drawings which shall be issued during course of execution. These drawings explain the general concept involved in the project only. These drawings shall undergo changes during course of execution, as work shall be executed as per GFC drawings. It is made clear that changes made in the tender drawings shall be incorporated in the GFC and subsequent in the work within the quoted rate and nothing extra shall be payable for such changes.

| S.No. | Description | Drg. No. |
|--------------|-------------------------------|-----------------|
| | Architectural Drawings | |
| 1. | New Block: Ground Floor Plan | 1 |
| 2. | New Block: First Floor Plan | 2 |

Schedule of Quantity uploaded separately