TENDER DOCUMENT

NIT No.: NRO/CON/773/678 dated 10.12.2018

FOR

Construction of Boundary Wall at Plot No. 4 & 5, Sector-7, GIDA, Gorakhpur for Software Technology Parks of India (STPI).

VOLUME – II

ADDITIONAL CONDITIONS OF CONTRACT

TECHNICAL SPECIFICATIONS

& DRAWINGS

EXECUTING AGENCY

ENGINEERING PROJECTS (INDIA) LIMITED
(A GOVT. OF INDIA ENTERPRISE)
Core-3, Scope Complex,
7, Lodhi Road, New Delhi-110003
TEL NO: 011-24361666, FAX NO. 011-24363426
ADDITIONAL CONDITIONS OF CONTRACT (ACC)

1.0 The following Additional Conditions of Contract shall be read in conjunction with General Conditions of Contract. If there are any provisions in these Additional Conditions of Contract, which are at variance with the provisions of General Conditions of Contract, the provisions in these Additional Conditions of Contract shall take precedence.

2.0 INTRODUCTION

Software Technology Parks of India (STPI) at Gorakhpur has entrusted the Construction of Boundary Wall at Plot No. 4 & 5, Sector-7, GIDA, Gorakhpur to EPI as PMC (Deposit work). EPI on behalf of STPI has invited the NIT as open tender from the eligible bidders as per NIT.

3.0 SCOPE OF WORK INCLUDED IN THE CONTRACT

The scope of work covers the entire Civil and Structural works Construction of Boundary Wall at Plot No. 4 & 5, Sector-7, GIDA, Gorakhpur.

The scope of work covers the entire construction work as stipulated above and as mentioned in BOQ/ drawings/ specification and handing over the project to EPIL /Client including the followings:

1. Civil and Structural works.
2. Other misc. works as required.

4.0 QUALIFICATION OF TENDERERS

The price bid of short listed tenderers who fulfill the eligibility criteria shall only be opened. The decision of EPI in this regard shall be final & binding on the tenderers.

5.0 DISQUALIFICATION

The tenderers may note that they are liable to be disqualified and not considered for the opening of their Price Bid if;

a) Representation in the forms, statements and attachments submitted in the pre-qualification document are proved to be incorrect, false and misleading.

b) They have record of poor performance during the past 10 years such as abandoning the work, rescinding of contract for which the reasons are attributable to the non-performance of the contractor, inordinate delay in completion, consistent history of litigation / arbitration awarded against the contractor or any of its constituents or financial failures due to bankruptcy etc. in their on going / past projects.

c) They have submitted incompletely filled in formats without attaching certified supporting documents and credentials to establish their eligibility to participate in the Tender.

d) If the tenderers attempt to influence any member of the committee.

EPI reserves its right to take appropriate action including disqualification of tenderer(s) as may be deemed fit and proper by EPI at any time without giving any notice to the contractor in this regard. The decision of EPI in the matter of disqualification shall be final and binding on the Tenderers.
6.0 The set of tender documents shall contain tender drawings one set of hard copy. The original hard copy of tender drawings shall be returned along with the tender documents duly signed and stamped by the tenderer & shall form part of agreement.

7.0 SPECIFICATIONS

7.1 The work in general shall be carried out as per latest CPWD specifications for Civil Works (updated with correction slips issued up to last date of submission of tender) and latest CPWD specification, unless otherwise specified in the nomenclature of the individual item or in the particular specifications of concerned items of works.

7.2 For items not covered under latest CPWD specification, for Civil Works specification and in particular specification or nomenclature of the individual item as above, the work shall be done as per latest relevant BIS codes of practice.

7.3 In case specification are not covered under para 7.1 & 7.2 above the work shall be carried out as per the provisions of technical specification.

7.4 In case of non availability of any specification in the above paras or any overlapping provisions, non-clarity on any issue, applicability of particular provision out of above, shall be decided by Engineer-in-Charge whose decision shall be final & binding on the contractor.

7.5 Clause no. 8.0 of GCC regarding Mobilization advance is deleted and not applicable for this contract.

7.6 Thermo Mechanically Treated bars conforming to IS: 1786, Fe 500 grade as required, from approved manufacturers viz SAIL/RINL/TISCO or equivalent shall be used. The other provisions of clause 45.2 of G.C.C. remain unchanged.

7.7 The Portland Pozzolana Cement (PPC) as per IS:1489-1991 or ordinary Portland Cement (OPC) as per IS:8112 shall be used in the works, however difference in price of PPC & OPC cement if is there shall be recovered from the contractor. The other provisions of clause 45.1 of GCC remain unchanged.

7.8 Specified material viz: cement, steel, structural steel etc shall be used. Material other than specified shall be used only with prior approval of EPI and recovery at prevailing market rate shall be done if material other than specified used.

8.0 Clause No.69.1 (IV) of GCC stands modified as under:

If the rates for the altered, additional or substituted work cannot be determined in the manner specified in sub-clauses (i) to (iii) of clause 69.1, then the Contractor shall, within 7 days of the date of receipt of order to carry out the work, inform the Engineer-in-Charge the rates which he intends to charge for such class of work, supported by analysis of the rate or rates claimed, and the Engineer-in-Charge shall determine the rate or rates on the basis of prevailing market rates of the material, Labour, T&P etc. plus 15% (Fifteen percent) to cover the Contractors supervision, overheads and profit and pay the Contractor accordingly. The opinion of the Engineer-in-charge as to the current market rates of materials and quantum of labour involved per unit of measurements will be final and binding on the Contractor. However, the Engineer-in-Charge, by notice in writing, will be at liberty to cancel his order to carry out such class of work and arrange to carry it out in such manner, as he may consider advisable. But under no circumstances, the Contractor shall suspend the work on the plea of non-settlement of rates of items falling under the clause.
9.0  The clause No.72.1 of GCC shall be replaced as under:

The Contractor shall ensure adequate progress during the execution of work according to the detailed Bar Chart / PERT chart prepared by him and mutually agreed within 10 days from the date of LOI.

However, the Contractor shall also maintain monthly progress strictly in accordance with bar chart and / or detailed time schedule that will be worked out on the basis of completion schedule. If the Contractor fails to maintain the above progress or to complete the work and clear the site on or before the contract or extended date of completion, he shall without prejudice to any other right or remedy available under the law to EPI on account of such breach, pay as agreed compensation and not as penalty at the rate of half percent (1/2%) per week or part there or delay of the value of the work shown above if there is delay for a particular stage or the entire value of contract if the whole of the work is delayed.

The total amount of compensation payable by the Contractor for delay in stage-wise completion or completion of the whole work shall not exceed 10% of the total tendered value of work as awarded.

10.0  Clause No. 72.4.1 of GCC stands modified as under:

Within 10 (Ten) days of date of Letter of Intent, the contractor shall submit a Time and Progress Chart (CPM/PERT/Quantified Bar Chart) and get it approved by the Engineer-in-Charge. The Chart shall be prepared in direct relation to the time stated in the contract documents for completion of items / scope of the works. It shall indicate the forecast (milestones) of the dates of commencement and completion of various items trades, sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time imposed in the contract documents, to ensure good progress during the execution of the work. The physical report including photographs shall be submitted by the contractor on the prescribed format & the intervals (not later than a month) as decided by the Engineer-in-Charge. The compensation for delay as per clause 72.1 (revised as per ACC) shall be leviable at intermediate stages also, in case the required progress is not achieved to meet the time deadlines of the completion period and / or milestones of time and progress chart provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the tendered value of work.

In case entire work is completed within the total time period of completion or extended period of completion allowed, the compensation for delay due to not achieving progress at intermediates stage, if any, shall be refunded without any interest charges.

11.0  COMPLETION SCHEDULE

The contractor will submit bar chart / completion schedule within 10 days from the date of LOI and same shall be approved by the Engineer-in-Charge.

12.0  WORK METHODOLOGY

The contractor has to plan the execution of work in professional manners and ensure the necessary arrangement as specified in the BOQ to keep the area dry & clean during construction stage and such arrangement shall be got approved from the Engineer-in-Charge before executing the work. Any other arrangement if required for above shall be deemed as included in the quoted price of the bidder and nothing shall be paid extra for providing such arrangement.
For specialized work, the contractor shall submit the methodology of work for the approval of Engineer-in-Charge before commencement of the work.

The contractor has to deploy resources and plan the work accordingly and nothing extra shall be payable to the contractor on this account. Since the part of the building shall be occupied during construction stage itself the contractor has to ensure safety of the men and material & sufficiently barricade the area so as to avoid any hazard to occupants.

13.0 PLANT & MACHINERY

All plant & machinery required for execution of work shall have to be arranged by the contractor at his own cost. However, the Contractor has to deploy following minimum plant & machinery at site immediately after award of work:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Minimum numbers required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total Station</td>
<td>One</td>
</tr>
<tr>
<td>2.</td>
<td>Leveling Instruments</td>
<td>One</td>
</tr>
<tr>
<td>3.</td>
<td>Vibrators (Petrol / Electrical)</td>
<td>Two</td>
</tr>
<tr>
<td>4.</td>
<td>Needles of Vibrator</td>
<td>One</td>
</tr>
<tr>
<td>5.</td>
<td>Concrete Mixers</td>
<td>One</td>
</tr>
<tr>
<td>6.</td>
<td>Weigh batches</td>
<td>One</td>
</tr>
<tr>
<td>7.</td>
<td>DG Set (63 KVA)</td>
<td>One</td>
</tr>
</tbody>
</table>

Note:

a) Any other equipment for site test as outlined in CPWD specification and as directed by the Engineer-in-Charge.

b) The quantities of equipments indicated are tentative and can be increased as per the requirement of work programme OR as per the direction of Engineer-in-Charge. The above equipment list is indicative and not complete. The contractor has to deploy all the required equipment to complete all the works within stipulated specifications & time period as per contract documents.

c) The contractor will not be allowed to take out equipments from the site without the written permission of Engineer-in-Charge.

14.0 FINAL BILL

The final bill will be submitted by the contractor within 90 days from the date of acceptance of completion of work accompanied by the following documents:

a) Completion certificate issued by the Engineer-in-Charge specifying the handing over of the work including list of inventories (fittings & fixtures).

b) Computerized stage wise payment schedule.

c) No claim certificate by the contactor.

d) No claim certificate from the sub-agencies / venders engaged by the contractor.

e) ‘As built’ drawings.

f) Periodical services and measurement books.

g) All statutory approvals from various state / central govt. local bodies, if required for completion & handing over of the work as included in scope of Contractor.
15.0 CONCRETING
As per enclosed Technical Specification.

16.0 BRICK WORK
As per enclosed Technical Specification.

17.0 CENTERING & SHUTTERING
As per enclosed Technical Specification.

18.0 GENERAL

18.1 The contractor shall be responsible for all protection of electrical fittings & fixture against pilferage, breakage during period of installation until the completion of work and handed over to EPI.

18.2 The tenderers shall make necessary safety arrangements at site including as mentioned in GCC and indemnify EPI against any consequence of accident at site.

18.3 EPI is awarding this Contract on behalf of STPI. In case M/s. EPI cease to be an agency for the project, the right and responsibility etc. of EPI in the Contract shall get transferred to STPI or their nominated agency shall operate this Contract.

19.0 ARBITRATION:

19.1 Clause no. 76.1 alongwith note
Deleted - There shall be no Arbitration Clause for this Contract except between Central Public Sector Undertakings inter se / Government of India Departments / Ministries as mentioned in the Clause No. 76.2 below:-

19.2 Clause no.76.2 ARBITRATION BETWEEN CENTRAL PUBLIC SECTOR ENTERPRISES INTER SE / GOVERNMENT OF INDIA DEPARTMENTS / MINISTRIES

i) In the event of any dispute or difference relating to the interpretation and application of the provisions of the contract, such dispute or difference shall be referred by either party to the arbitration as per the instructions (Office Memorandum / Circulars) issued by Govt. of India from time to time with regard to arbitration between one Government Department and another one Government Department and a Public Sector Enterprise and Public Sector Enterprise inter se.

ii) Subject to any amendment that may be carried out by the Government of India from time to time, the procedure to be followed in the arbitration shall be as is contained in D.O. No. DPE/4/(10)/2001-PMA-GL-I dated 22.01.2004 of Department of Public Enterprises, Ministry of Heavy Industries and Public Enterprises, Govt. of India or any modification issued in this regard.

19.3 Clause No.76.3, stands modified as under :

JURISDICTION: The courts in Delhi/ New Delhi alone will have jurisdiction to deal with matters arising from the contract, to the exclusion of all other courts.
20.0 DEPLOYMENT OF TECHNICAL STAFF FOR THE WORK

<table>
<thead>
<tr>
<th>Requirement of Technical Staff</th>
<th>Minimum experience</th>
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<tr>
<td>Qualification</td>
<td>Number</td>
</tr>
<tr>
<td>i) Graduate/ Diploma Engineer (Civil)</td>
<td>1</td>
</tr>
<tr>
<td>ii) Supervisors (Diploma Engineering in Civil or ITI)</td>
<td>1</td>
</tr>
</tbody>
</table>

21.0 PAYMENT TERMS

In addition to Cl. No. 37 of General Conditions of Contract, the following shall also govern the terms of payment:

Payment will be made based on measurements entered in Measurement Book (MB) & certification of the same by Engineer – in-charge. The contractor shall remain bound to render all assistance to the Engineer – in-charge or his authorized representative during such checking of the measurements. The payment of running account bills / final bill shall be released on receipt of funds from STPI to EPI. The contractor does not have the right to claim delay in payments due to delay in receipt of funds from STPI.

22.0 MATERIALS MAKES

A list of preferred make is enclosed in this tender. However, contractor is free to choose any other make of materials of equivalent standard from the reputed manufacturers with the written approval of Engineer In-charge, but such materials should be ISI mark and as per Indian standard.

23.0 ROAD PERMIT

Road permit for transportation of goods across state border shall not be issued by STPI / EPI and will have to be arranged by contractor on his own. Transit Insurance of the equipment shall be arranged by the contractor. Nothing extra shall be paid on this account. Contractor must get registered with Sales Tax Department of Delhi.

24.0 TESTING OF MATERIALS & CONCRETE AT SITE

All necessary tests shall be carried out by the contractor at their own cost at Govt. approved laboratories. No extra shall be paid for conducting test.

25.0 SECURITY DEPOSIT

In the event of award of “Works”, Contractor shall submit to EPI, Bank Guarantees from a Nationalized Bank / Scheduled Bank towards security deposit @ 5% of the contract value of the accepted tender within 10 days from the date of LOI as per the EPI format enclosed and BG shall be valid upto the defect liability period i.e. 12 months from the date of taking over the project, with claim period of 6 months failing which EPI at his discretion may revoke the LOI & forfeit the EMD furnished along with tender. Security deposit will be returned to the contractor after satisfactory expiry of defect liability period.

26.0 RETENTION MONEY
The Retention Money shall be deducted from each running bill of the Contractor at 5% (five percent only) of the gross value of the Running Account bill. The Earnest Money Deposited by the tenderer in the form of Demand Draft will be treated as part of the Retention Money. The retention money shall be refunded after expiry of defect liability period. Clause no 10.00 & 34.00 of GCC shall also be referred for payment of Retention money.

27.0 Concrete mixed design by using approved admixture shall be carried out by the contractor at his own cost from approved laboratory before starting the work.

28.0 For items not covered under any of the specifications mentioned in Tender Documents, the works shall be carried out as per CPWD Specifications / manufacturer’s specifications/General Engineering Practice and/State Govt. or as per directions of Engineer-in-Charge. The rate for such extra work shall be derived as follows:

a) If the item is available in DSR 2016, contractor has to execute the item with the same rate below or at par tender percentage.

b) If the item is not available in DSR 2016 and similar item is available, rate for such extra work shall be derived from the similar item by adding or deleting the differences below or at par tender percentage.

c) If the rate for any item is not possible to derive as mentioned above, the rate for which shall be derived by analyzing as per the prevailing market rates.

29.0 The Contractor shall procure Reinforcement steel and Structural steel required for the works directly from the Manufacturer/authorized dealer which mandatorily have to be primary procedure re-rolled reinforcement shall be used.

30.0 The contractor should invariably obtain necessary manufacturers test certificates from the suppliers of steel and cement for each and every consignment and furnish them to the Engineer-in-charge before use on works.

31.0 The original bills of procurement should be submitted to the Engineer-in-charge for making payment of the item. The contractor shall purchase the steel and cement on the name of work, the name of contractor and furnish the same to the Engineer-in-charge. The steel and cement without the above two names will not be accepted on the works.

32.0 If any difference is observed on carriage inwards, carriage outwards and theoretical requirement of steel and cement for finished works, recovery at double the rate will be effected from the contractors bills for the quantity varied above the allowable limits.

33.0 Three sets of As Built Drawings shall be submitted by the contractor in hard and soft copies on completion of work.
34.0 For all Schedule BOQ items the nomenclature /rates/ unit of DSR items shall be followed. In case of any ambiguity is observed in Scheduled BOQ items relevant DSR item will hold good.

35.0 Water and Electricity required for construction activities shall be arranged by contractor at his own cost. Quality of water should be get approved from engineer In-charge as per relevant IS standard.

36.0 The Contractor shall be fully responsible to complete the “Works” in workmen like manner to the satisfaction of Client and EPI by maintaining high standard of quality and precision as per ‘Tender documents’, Agreements, Terms & Conditions, Specifications, Drawings etc., within the contractual completion period and within their quoted rates/amount. In case Client reduces or increases scope of work related to Contractor’s portion of work, the same shall be binding on Contractor and the Contractor has to execute the same at rates quoted by them.

37.0 In case Contractor is awarded the “Works” and fails to execute the same as per agreed schedule of progress of work and as per specified quality and/or lags behind in activities required for timely completion of “Works”, as determined by EPI/Client, then EPI shall give 15 days written notice to Contractor to achieve the specified quality and/or to deploy adequate resources to the satisfaction of EPI, for timely completion of “Works”. Upon expiry of the notice period, if Contractor fails to achieve specified quality and/or fails to take action for timely completion of “Works”, then EPI shall have option to withdraw the remaining work partly or in full from Contractor and get the same executed at the risk and cost of the Contractor from alternative agency/agencies.

38.0 The Contractor confirms that he holds EPF Code number, ESI registration number, PAN (Permanent Account Number of Income Tax), GST registration number etc. and shall be responsible for depositing EPF subscription and contribution for labour and staff employed by it on the “Works” and other taxes, duties and dues etc. as per statutory requirements and documentary evidence of same shall be provided to EPI. The Contractor shall also be responsible for labour welfare and for arranging labour and other licenses/ permits/ clearances etc. for the project at their own cost. The Contractor shall comply with all the requirements as per labour laws/acts. All the records in this regard shall be maintained by Contractor as per statutory requirements and rules and shall be produced by the Contractor on demand if required.

39.0 The Contractor shall be responsible for obtaining all approvals from EPI/Client with regard to quality of materials & workmanship and measurements etc. for their portion of work. The Contractor shall be responsible for reconciliation of issue material, if any. In case there is any shortfall of free issue items found during reconciliation, recovery at double the cost of materials prevailing at that time of recovery shall be made from the Contractor’s due payment.
40.0 In case of non-approval of Contractor’s association for the Project by the Client and/or by the corporate office of EPI due to any reasons whatsoever at any stage of the “Works”, the Contractor shall have no claim on EPI.

41.0 Income tax shall be deducted as per the prevailing rate of tax as applicable.

42.0 The Contractor shall plan and execute the “Work” in his scope of work in such a manner that the other works, connected with the “Works” of the Contractor, but not included in Contractor’s scope of work do not get affected / delayed.

43.0 The quantities indicated in the BOQ are tentative. However contractor has to execute the works as per drawings and site conditions. Payment will be released for the work executed as per the rates quoted by contractor even if the quantities increases or decreases up to any extent.

44.0 The Contractor shall deploy sufficient plant & equipment of the required capacity and in good working condition for completion of the works in stipulated time with required quality. The equipment should either be owned by the Contractor or hired/leased. The deployment of equipment by Contractor shall be as decided by EPI and the same shall not be less than the minimum deployment stipulated, if any, for execution of “Works” and as per schedule agreed with EPI. The Contractor shall make arrangement for regular maintenance including preventive and breakdown maintenance and maintain stock of essential spares at site/near to site so as to ensure minimum breakdown time of equipment. The equipment once brought to site shall not be allowed to be removed without the consent of EPI. In case the Contractor fails to deploy sufficient equipment to the satisfaction of EPI or in case of prolonged breakdown of equipment, EPI at its sole discretion shall arrange the required equipment and debit all the related costs including ten percent overheads of EPI and shall recover the same from the due payments of Contractor, including from its bank guarantees available with EPI.

45.0 Contractor shall ensure compliance with all Central, State and Local Laws, Rules, Regulations etc. as applicable or may be applicable during the course of execution, maintenance etc. of the “Works” and shall indemnify EPI against any claim or damages whatsoever on such accounts. The Contractor shall keep EPI indemnified at all times against infringement of any Patent or Intellectual Property rights.

46.0 EPI is an IS0-9001 and ISO-14001 Company. The conditions of the ISO as applicable should be followed by the Contractor for implementation & maintaining the established procedures of EPI for this purpose. Following documents have been provided by EPI to Contractor & Contractor confirms receipt of the same:
   a. Quality, Environmental, OH & safety policy
   b. Environmental, Objectives & Targets
   c. Operational control – Noise
   d. Operational control – wastage
   e. Operational control – energy
   f. Operational control – Deforestation
   g. Operational control – Plantation of trees
   h. OH & S. management objects & targets
47.0 Project sign board to be supplied and erected at the site office as per the drawing enclosed.

48.0 The work executed by Contractor shall be subject to audit and quality control checks from Quality Control Division & Technical Audit of EPI, Client, Inspecting Agency of the Client and Chief Technical Examiner of Central Vigilance Commission, Govt. of India. In the eventuality of any defect/ sub standard works as brought out in the report or noticed otherwise at any time during execution, maintenance period etc., the same shall be made good by the Contractor. In case Contractor fails to rectify the defect/sub-standard work within the time period stipulated by EPI, EPI shall get it rectified at the risk and cost of Contractor and shall recover the amount from the dues of the Contractor.

49.0 EPI has agreed to award the work to the Contractor on the basis of details regarding experience profile, financial standing, credentials, fulfillment of statutory obligations, etc. of Contractor submitted by Contractor to EPI. In case, at a later stage if it is found that the Contractor has submitted incorrect, false details and credentials resulting in apprehensions on the capabilities of Contractor with regard to quality & timely completion of works, financial capabilities etc, EPI can terminate this order solely at its option. In this eventuality the Contractor shall be liable for the losses suffered by EPI and further Contractor shall have no claim on EPI, whatsoever.

50.0 FACILITIES TO BE PROVIDED BY PARTY TO EPI

GCC clause no. 28.3 stand deleted.

51.0 TAXES AND DUTIES

Clause no 13.0 of GCC is amended to the extent as stated as per Clause 13.0 of NIT.

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<thead>
<tr>
<th>SL.No</th>
<th>DESCRIPTION</th>
<th>APPROVED MAKES / AGENCIES</th>
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<tbody>
<tr>
<td>(A)</td>
<td>Civil</td>
<td></td>
</tr>
</tbody>
</table>
| 1     | Anti- Termite Treatment (Chemical Manufacturer) | (i) Kitnesa Corporation, Kolkata  
       |                           | (ii) D- Nocil, Mumbai  
       |                           | (iii) Dhawan Pesticides, Delhi  
       |                           | (iv) Kamona Chemicals Ind. Ltd  
       |                           | (v) Indian Pest Control |
| 2     | Synthetic Enamel paint (First Quality) | Asian Paints Ltd, ICI paints , Jenson & Nicholson Ind Ltd, |
| 3     | Oil Bound Distemper | Asian Paints Ltd, Berger Paints Ind. Ltd, shalimar paints ind. Ltd, Jenson & Nicholson Ind Ltd, |
| 4     | Acrylic Emulsion Exterior | Asian Paints Ltd, ICI paints , Jenson & Nicholson Ind Ltd, |
| 5     | Cement Base Paint | (i) M/s Asian Paints Ltd  
       |                           | (ii) M/s Berger Paints India Ltd  
       |                           | (iii) M/s Shalimar Paints Ltd  
       |                           | (iv) Snowcem |
| 6     | Cement Primer/Wood Primer Pink / Red Oxide Steel Primer | (i) M/s Asian Paints Ltd  
       |                           | (ii) M/s Berger Paints India Ltd  
       |                           | (iii) M/s Shalimar Paints Ltd  
       |                           | (iv) M/s ICI India Ltd |
| 7     | Aluminium Doors & Windows | (i) M/s Jindal aluminium co. Bangalore  
       |                           | (ii) MAHAVEER  
       |                           | (iii) BANCO  
       |                           | (iv) National  
       |                           | (v) Rama |
| 8     | Dry Distemper | (i) M/s Power Paints india pvt Ltd  
       |                           | (ii) M/s Godawari Paints Pvt Ltd  
       |                           | (iii) M/s Evershine Paints & Chemicals  
       |                           | (iv) M/s Golden Paints & Chemicals |
| 9     | Steel Windows/ Vents and Pressed Steel Frames | (i) M/s PD Industries  
       |                           | (ii) M/s SKS Steel Industries , New Delhi  
       |                           | (iii) M/s Shri Ganpati Doors  
       |                           | (iv) Shiv Maullar  
       |                           | (v) M/s Jangid Engg Works , Jaipur  
       |                           | (vi) Agew Industries  
       |                           | (v) As Approved locally by PM |
| 10    | Precast Terrazo tiles/ Paving Blocks/ Chequered Cement concrete tiles / PCC | (i) M/s Northern India Tiles Corp. (NITCO)  
       |                           | (ii) M/s Modern tiles And Marbles  
       |                           | (iii) Hindustan Tiles  
       |                           | (iv) Somani Tiles |
| 11    | Water Proofing Membrane | (i) M/s Texsa India Ltd  
       |                           | (ii) M/s Pidilite Industries  
       |                           | (iii) M/s Polygon Chemicals Pvt Ltd  
       |                           | (iv) M/s Bengal Bituman |
| 12    | Water Proofing Compound | (i) M/s Pidilite Industries  
       |                           | (ii) M/s FOSROC  
       |                           | (iii) M/s CICO  
<pre><code>   |                           | (iv) M/s Dr FIXIT |
</code></pre>
<table>
<thead>
<tr>
<th></th>
<th>Product Name</th>
<th>(i) M/s Pidilite Industries</th>
<th>(ii) M/s Dr FIXIT</th>
<th>(iii) M/s Apex Encon Projects Pvt Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Concrete Additives</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>Wood Adhesive</td>
<td>Fevicol / Vamicol / Dunlop</td>
<td></td>
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<tr>
<td>15</td>
<td>Wall Putty</td>
<td>Birla Wall Putty/ Jk wall Putty/ Ferrous Crete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Floor &amp; Wall ceramic Tiles &amp; Vitrified Tiles</td>
<td>(i) M/s Somany Ceramiv Ltd</td>
<td>(ii) M/s Kajaria Ceramics Ltd</td>
<td>(iii) M/s Orient Ceramics Industries ltd.</td>
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<td></td>
<td></td>
<td>(iv) M/s Johnson</td>
<td>(v) Varmora</td>
<td>(vi) Asian</td>
</tr>
<tr>
<td>17</td>
<td>Flush Doors</td>
<td>(i) M/s Archidply Industries Ltd</td>
<td>(ii) M/s Indian Timber Products Pvt.Ltd</td>
<td>(iii) M/s Merino Group Of Industries</td>
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<td>(iv) M/s Alpro</td>
<td></td>
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</tr>
<tr>
<td>18</td>
<td>Laminated Sheet</td>
<td>Formica/ Decolam/ Sunmica/ Novateak/ Greenply/Archid Ply/GREEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Plain / Veneered Particle Board</td>
<td>(i) M/s Shirdhi Industries Ltd</td>
<td>(ii) M/s Green Ply Industries</td>
<td>(iii) M/s Archidply Industries Ltd</td>
</tr>
<tr>
<td>20</td>
<td>Prelaminated particle Board</td>
<td>(i) M/s Novapan industries Ltd</td>
<td>(ii) M/s Shirdhi industries Ltd</td>
<td>(iii) M/s Green Ply Industries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv) M/s Century Ply Ltd</td>
<td>(v) M/s Archid Ply</td>
<td>(vi) Eco board</td>
</tr>
<tr>
<td>21</td>
<td>Block Board / Ply Wood</td>
<td>(i) M/s Merino group of Industries</td>
<td>(ii) M/s Archidply Industries ltd</td>
<td>(iii) M/s Green Ply Industries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv) M/s Century Ply Ltd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Plain &amp; Prelaminated MDF Board</td>
<td>(i) M/s Merino group of Industries</td>
<td>(ii) M/s Shirdhi group of Industries</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>TMT Steel Main Producers</td>
<td>(i) M/s SAIL</td>
<td>(ii) M/s TISCO</td>
<td>(iii) M/s RINL/Vizag</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv) M/s JSW Steel Ltd.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>RCC Hume Pipes</td>
<td>(i) M/s Orient Ceramics &amp; Refraction Pvt. Ltd</td>
<td>(ii) M/s Anand Pipes, Firozpur/ISI Approved manufacture</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv) Classic</td>
<td>(v) Crown</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Synthetic Triangular Fibre for Concrete &amp; Cement</td>
<td>(i) M/s Reliance Industries</td>
<td>(ii) M/s FIBREMESH</td>
<td>(iii) M/s FORTA</td>
</tr>
<tr>
<td>27</td>
<td>Cement</td>
<td>ACC/L&amp;T/Ultratech Cement/J&amp;K/Birla/Ambuja Cement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Item Description</td>
<td>Manufacturer/Brand Names</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------</td>
<td>---------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Curtain Rods</td>
<td>L&amp;T/Vista</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>SFRC Manhole Cover and Frame</td>
<td>ISI Marked as Approved by PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Ready Mix Concrete</td>
<td>Unitech Ltd/ UltraTech Concrete / ACC / Lafarge Concrete / Ashoka / Godrej / Ahlcon/RMC India Pvt. Ltd.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Stainless Screws</td>
<td>Kundan / Puja / Atul / Crown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Dash Fastener</td>
<td>Hilti / Fischer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Looking Mirror</td>
<td>M/s Jaquar &amp; Company Pvt Ltd. (Jaquar)/ Modiguard/ Saint Gobain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Clear Glass</td>
<td>Atul / Modiguard/ Saint Gobain / Aasahi India Safety Glass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>GI &amp; SS Wire Mesh</td>
<td>Tiger / M/s Elite Shutter Industries, Jammu/New Delhi / Jayana/ M/s Shree Radhey Enterprises, Ghaziabad / Selected Products Co, New Kundli/ M/s SS Steel Industries, N.Delhi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Cockroach Trap</td>
<td>Chilly / Kingston / Jayana / Player / Dhawan Sanitary Udyog (prima) / Prayag polymers Pvt Ltd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Iron Mongery Mild Steel (ISI Marked)</td>
<td>Oxford/ Jyoti / MC Maojoo &amp; Co Kolkata / Shree Ganapathi Doors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Water Proofing Treatment</td>
<td>Pidilite / Shalimar/ Dr Fixit/ STP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION – 1

GENERAL TECHNICAL SPECIFICATION
FOR CIVIL OF
BOUNDARY WALL
GENERAL TECHNICAL SPECIFICATIONS

All works shall be executed, measured and paid for as per latest Central Public Works Department (C.P.W.D.) Specifications, unless otherwise provided in the item detail / agreement.

The tenderers are requested to obtain the copies of the above documents directly from the office of Central Public Works Department (C.P.W.D.) as these Specifications are not being issued along with the tender documents. These specifications with up to date correction slips will form part of the contract agreement to be executed with the successful tenderer.
SECTION – 2

PARTICULAR TECHNICAL SPECIFICATIONS
(CIVIL WORKS)
PARTICULAR TECHNICAL SPECIFICATIONS

FOR

CIVIL WORK

1. **EARTH WORK:**

   The work shall be done in accordance with CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips.

2. **CONCRETE WORK:**

   The work shall be done in accordance with CPWD Specifications - 2009 - Vol.I& Vol. II with upto date correction slips.

3. **R.C.C. WORK (DESIGN MIX CONCRETE):**

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

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


c) Water:– It shall conform to requirements laid down in IS:456-2000 / Para 5.4 or CPWD Specifications - 2009 - Vol.I & Vol. II with correction slips.

d) Cement:– OPC of grade 43 shall be used for design mix concrete and shall conform to IS-8112, IS-12269 or IS-12270. However, if higher grade of cement is used by the contractor nothing extra shall be paid on this account.

e) Admixture / Plasticizer – The admixture shall confirm to IS:9103. Whenever required, the admixture of approved quality & approved make only shall be used to attain the required workability.

3.3 Grade of Concrete:– The compressive strength of various grades of concrete with various parameters shall be as follows :-

<table>
<thead>
<tr>
<th>GRADE DESIGNATION</th>
<th>COMPRESSIVE STRENGTH ON 15 Cm. CUBES Min. 7 DAYS (N/mm²)</th>
<th>SPECIFIED CHARACTERISTIC COMPRESSION STRENGTH AT 28 DAYS (N/mm²)</th>
<th>MINIMUM CEMENT CONTENT (Kg. Per Cub. Mtr.)</th>
<th>MAXIMUM WATER CEMENT RATIO</th>
<th>SLUMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-25</td>
<td>As per Design</td>
<td>25</td>
<td>330</td>
<td>0.50</td>
<td>25-75</td>
</tr>
<tr>
<td>M-30</td>
<td>As per Design</td>
<td>30</td>
<td>340</td>
<td>0.45</td>
<td>25-75</td>
</tr>
<tr>
<td>M-35</td>
<td>As per Design</td>
<td>35</td>
<td>350</td>
<td>0.45</td>
<td>25-75</td>
</tr>
</tbody>
</table>

NOTE:–

a) In the designation of a Concrete mix letter M refers to the mix and the number of the specified characteristic compressive strength of 15 cm - Cube at 28 days expressed in N/mm².
b) It is specifically highlighted that in addition to the above requirements. The maximum cement content for any grade shall be limited to 530 kg. / Cubic metre.

c) The minimum / maximum cement content for design mix concrete shall be maintained as per the quantity mentioned above. Even in the case where the quantity of cement required is higher than the minimum specified above to achieve desired strength based on an approved mix design, nothing extra shall become payable to the contractor.

3.4 The Contractor shall engage one of the following approved laboratories / test house for designing the concrete mix in accordance with relevant IS Code and to conduct laboratory tests to ensure the target strength & workability criteria for a given grade of concrete.

a) Any State University


c) IITs.

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

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

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

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

3.7 TRIAL BATCHES

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

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

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

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

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

3.8 All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the Contractor including redesigning of the concrete mix wherever required & directed by Engineer-In-Charge.

3.9 APPROVAL OF DESIGN MIX:-
a) The mix design for a specified grade of concrete shall be done for a target mean compressive strength \( T_{ck} = F_{ck} + 1.65s \)

Where \( F_{ck} = \) Characteristic compressive strength at 28 days.
\( s = \) Standard deviation which depends on degree of quality control.

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

<table>
<thead>
<tr>
<th>GRADE OF CONCRETE</th>
<th>STANDARD DEVIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-20</td>
<td>4.0</td>
</tr>
<tr>
<td>M-25</td>
<td>4.0</td>
</tr>
<tr>
<td>M-30</td>
<td>5.0</td>
</tr>
<tr>
<td>M-35</td>
<td>5.0</td>
</tr>
<tr>
<td>M-40</td>
<td>5.0</td>
</tr>
</tbody>
</table>

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

c) Out of the six specimens of each set, three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28 days. While the design mix shall be approved only on the basis of test strength at 28 days.

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

(i) The average strength of each test-set is not less than the specified target mean compressive strength (\( T_{ck} \)).

(ii) The strength of any specimen cube is not less than 0.85 \( T_{ck} \).

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

3.10 BATCHING & MIXING:
a) All concreting shall be done using computerised automatic concrete batching plant with automatic admixture dispenser which shall be installed by the contractor at site, calibrated & tested. The batching plant shall conform to IS: 4925. It shall have the facilities of data print-outs, presetting the quantity to be weighed with automatic cut-off when the same is achieved.

b) In case of non-availability of batched concrete, ready mix concrete (RMC) may be used. The concrete to site shall be transported by transit mixtures. All the precautions shall be taken during the transportation and handling of concrete to achieve the desired strength, durability, etc. as envisaged in the mix design. Contractor has to get the approval from Engineer-In-Charge regarding source of ready mix concrete. Nothing extra shall be paid for ready mix concrete instead of batched mixed concrete.

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

d) Only single sized good quality stone aggregate shall be brought to site of work from the approved source. The grading of the stone aggregate shall be controlled by blending the aggregate of different sizes in the required proportions at site of work.

The aggregate of different sizes shall be stock-piled separately, preferably a day before use.

The grading of coarse and fine aggregates shall be checked as frequently as possible and as directed by the Engineer-In-Charge to ensure that the specified grading and quality of aggregate is maintained.

e) It is important to maintain the water cement ratio constant at its specified or approved value by making adjustment for the moisture contents of both fine and coarse aggregates.

The moisture contents in the aggregate shall be determined as frequently as possible in keeping
with the weather conditions and as per the provisions of IS:2386 (Part-III) 1963.

3.11 LAYING:

a) The concrete shall be placed in position using tower crane or concrete pumps of adequate capacity. Use of mechanical hoists shall not be permitted for lifting of concrete to various levels. For pumping of concrete the design of concrete mix shall be done separately. Nothing extra for laying concrete using concrete pumps or for extra concrete mix design shall be paid.

3.12 All other operations in concreting work like mixing, slump, laying, placing of concrete, compaction, curing etc. not mentioned in this particular specifications for Design Mix of Concrete shall be as per CPWD Specifications - 2009 - Vol.I& Vol. II with upto date correction slips.

3.13 SAMPLING:

a) Samples from fresh concrete shall be taken as per IS 1199-1959 and the test cubes shall be made, cured and tested in accordance with IS:516-1959.

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

c) FREQUENCY OF SAMPLING:

(i) A random sampling procedure shall be adopted to ensure that the sampling is spread over the entire period of concreting and cover all mixing units.

(ii) The concrete work shall be notionally divided into lots as under for the purpose of sampling conditions.

- Footings, rafts etc.
- Columns and walls at all levels.
• Beams at all levels.

• Slabs at all levels.

(iii) At least one test sample shall be taken for each lot of concrete work.

(iv) Each grade of concrete shall form different lot of testing.

(v) The minimum frequency of sampling of concrete of each grade shall be in accordance with the following:

<table>
<thead>
<tr>
<th>QUANTITY OF CONCRETE IN THE WORK, CUBIC METRE PER DAY.</th>
<th>NUMBER OF SAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>1</td>
</tr>
<tr>
<td>6-15</td>
<td>2</td>
</tr>
<tr>
<td>16-30</td>
<td>3</td>
</tr>
<tr>
<td>31-50</td>
<td>4</td>
</tr>
<tr>
<td>51 &amp; above</td>
<td>4 Plus one additional sample for each additional 50 cubic meter or part thereof.</td>
</tr>
</tbody>
</table>

NOTE:- At least one sample shall be taken from each shift.

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

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

3.15 TEST RESULTS OF SAMPLES:-

The test results of the sample shall be the average of the strength of three specimen. The individual variation shall not be more than ± 15% percent of the average. If variation is more, the test results shall be treated as invalid. 90% of the total tests shall be done at the laboratory established at site by the contractor and remaining 10% in the laboratory of Central Designs Organization, CPWD or
in any other laboratory as directed by the Engineer-in-Charge.

3.16 STANDARD OF ACCEPTANCE:-

a) In case the test results of all the samples are above the characteristic compressive strength, the concrete shall be accepted.

b) In case the test result of one or more samples fails to meet the requirement (a) above, it shall be accepted if both the following conditions are met:-

(i) Any individual test result is not less than (Fck - 3) N/mm2.

(ii) The mean of test results from any group of four consecutive samples is more than (Fck + 3) N/mm2.

(iii) Concrete of each grade shall be assessed separately.

c) Concrete is liable to be rejected, if it is porous or honeycombed, its placing has been interrupted without providing a proper construction joint, the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met.

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

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

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

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


3.21 **Tolerances** - As per CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips.

3.22 **Rates:**

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

b) In case of actual average compressive strength being less than specified strength which shall be governed by para “Standard of Acceptance” as above the rate payable shall be worked out accordingly as per CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips.

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

3.23 In respect of all projected slabs at all levels including cantilever, canopy, the payment for the RCC work shall be made under the item RCC slabs. The payment for shuttering at the edges shall be made under item of centring and shuttering for RCC slabs.
Nothing extra shall be paid for the side shuttering at the edge of projected slabs.

3.24 SHUTTERING:-

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

Dented, broken, cracked, twisted or rusted shuttering plates shall not be allowed to be used on the work.

The shuttering plates shall be cleaned properly with electrically driven sanders to remove any cement slurry or cement mortar or rust. Proper shuttering oil or debonding compound shall be applied on the surface of the shutter plates in the requisite quantity before assembly of steel reinforcement.

3.25 REINFORCEMENT:-

a) The reinforcement shall be done as per CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips.

b) The rate of item of reinforcement of RCC work includes all operations including straightening, cutting, bending, welding, binding with annealed steel or welding and placing in position at all the floors with all leads and lift complete as per CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips.

c) To avoid displacement of bars in any direction and to ensure proper cover, only factory made round type cover blocks shall be used by the contractor. Nothing extra shall be payable on this account.

4. BRICK WORK:-

4.1 The brick work shall be carried out with good quality fly ash bricks of 75 designations for full brick work and 100 designation for half brick work as per CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips or as specified. The rate shall also include for leaving chases / notches.
for dowels / cramps for all kinds of cladding to come over brick work.

5. **WOOD WORK:**

5.1 The wood work in general shall be carried out as per CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips.

5.2 All fittings and fixtures shall be got approved from the Engineer-in Charge before procurement well in advance and the approved samples shall be kept at site till completion of the work.

5.3 Glazing for toilets shall be of translucent type.

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

5.5 **FLUSH DOOR SHUTTERS:**

a) It shall be manufactured as per nomenclature of the item & as per drawings.

b) Flush door shutters shall be procured from approved manufacturer only.

c) Teak wood lipping shall be fixed on all the edges with the help of approved adhesive & using headless nails.

d) Laminate of required thickness shall be fixed on the flush door shutter using the approved adhesive.

e) On the entire exposed wooden surface, spirit polishing as per C.P.W.D. specification should be done.

f) Rate - Length and breadth shall be measured to a correct a cm.

6. **STEEL WORK:**

6.1 The work shall be done in accordance with CPWD Specifications - 2009 - Vol.I & Vol. II with upto date correction slips.
7. **FLOORING:**

7.1 All work in general shall be carried out as per CPWD Specifications - 2009 - Vol.I & Vol. II with up to date correction slips.

7.2 Whenever flooring is to be done in patterns tiles / stone, the contractor shall get samples of each pattern laid and approved by the Engineer-in-charge before final laying of such flooring for which nothing extra shall be paid.

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

7.4 The proper gradient shall be given to flooring as per the directions of Engineer-in-charge.

8. **ROOFING:**

8.1 The work shall be done in accordance with CPWD Specifications - 2009 - Vol.I & Vol. II with up to date correction slips.

9. **FINISHING:**

9.1 The work shall be done in accordance with CPWD Specifications - 2009 - Vol.I & Vol. II with up to date correction slips.

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

10. **WATERPROOFING WORK:**

The waterproofing work shall be done in accordance with the item description and with CPWD Specifications - 2009 - Vol.I & Vol.II with up to date correction slips.
11. **MISCELLANEOUS WORKS**

11.1 The work shall be done in accordance with CPWD Specifications - 2009 - Vol.I & Vol. II with up to date correction slips.

12. **NON SCHEDULED ITEMS:**

12.1 Chicken Mesh

Providing and fixing hexagonal chicken mesh having opening 20mmx20mm of 26 gauge at junctions of concrete & brick work or between different material etc. as directed by Engineer-in-charge

**Material and Workmanship:** As per item description and general specifications.

**Mode of measurement and Payment:** The item shall be measured in Sqm in plan area.

12.2 Grooves in Plaster

Forming groove of uniform size from 12x12 mm and up to 25x15 mm in plastered surface as per approved pattern, using including wooden battens, nailed to the under layer including removal of wooden battens, repairs to the edge of plaster panel and finishing the groove complete as per specifications and direction of the Engineer-in-Charge.

**Material and Workmanship:** As per item description and CPWD specifications.

**Mode of measurement and Payment:** The item shall be measured in m.

12.3 Providing and Fixing MS sheet is openings made by CNC cutting as per design

Providing & fixing 1mm MS sheet with perforation using CNC cutting technology as per given design and dwg, complete in all respect including cost of all plant and machine, lead & lifts, labour, tools etc

**Material and Workmanship:** As per item description and standard market practices.

**Mode of measurement and Payment:** The item shall be measured in sqm.
SECTION - 3

PARTICULAR TECHNICAL SPECIFICATIONS

(SANITARY WORKS)
TECHNICAL SPECIFICATION
FOR SANITARY /WATER/SUPPLY

Section - A  SANITARY FIXTURES

1. Scope of Work

1.1 Work under this section shall consist of furnishing all labour necessary and required to completely remove all existing sanitary accessories and install new sanitary fixture and accessories as required by the drawing and specified hereinafter.

1.2 Without restricting to the generality of the foregoing the sanitary fixture shall include fixing all sanitary fixture, fitting and accessories etc, necessary and required for the installation.

1.3 Whether specifically mentioned or not all fixture and appliances shall be provided with all fixing devices, nuts, bolts, screws, hangers, as required.

1.4 All exposed pipes within toilets and near fixture shall be Cast Iron/CPVC unless otherwise specified.

2. General Requirements

2.1 All fixture and fitting shall be provided with all such accessories as are required to complete the item in working condition whether specifically mentioned or not in the specification and drawings.

2.2 All fixture and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per architectural/interior designer’s requirements. Wherever necessary the fittings shall be centered to dimensions and pattern desired.

2.3 Fixing screws shall be half round head chromium plated brass with chrome plated washers wherever required.
2.4 All fittings and fixture shall be fixed in a neat workman like manner true too levels and heights shown on the drawings and in accordance with the manufacturer’s recommendations. Care shall be taken to fix all Inlet and outlet pipes at correct positions. Faulty locations shall not be accepted and the Contractor shall rectify the same. Any consequential damages to the finished works shall also be made good by the Contactor at his own coat.

3. **Water Closet**

3.1 Water cosset shall be floor mounted type European style or Indian style with P or S trap. The EWC shall be with plastic seat and lid and seat mounted flushing cistern or flush valve as called for in BOQ.

3.2 Each WC seat shall be so fixed that it remains absolutely stationary in vertical position without falling down on the WC.

4. **Lavatory Basin**

4.1 Lavatory basin shall be white glazed vitreous china.

4.2 Each basin shall be provided with cast iron brackets and clips and securely fixed to wall. Placing of basins over the brackets without secure fixing shall not be accepted.

5. **Accessories**

5.1 Contractors shall install all chromium plated and porcelain accessories as shown on the drawings or directed by Managers/Consultants.

5.2 All CP accessories shall be fixed with CP brass half round head screws and cup washers in wall with rawl plugs or nylon sleeves and shall include cutting and making good as required or directed by Managers/Consultants.

5.3 Porcelain accessories shall be fixed in walls and set in cement mortar 1:2 (1cement:2 coarse sand) and fixed in relation to the tiling work.
Section B - SOIL, WASTE, VENT & RAIN WATER PIPES

1. Scope of Work

1.1 Work under this section shall consist of furnishing all labour, material equipment and appliances necessary and required to install all new soil, waste, vent and rainwater pipes as required by the drawings, specified hereinafter.

1.2 Without restricting to the generality of the foregoing, the soil, waste, vent, and rainwater pipes system shall include the following:

a) Providing all new pipes, fitting & accessories.

b) Vertical and horizontal Soil, Waste and Vent Pipes, Rainwater pipes and Fittings, Joints, Clamps and Connections to Fixtures.

c) Connection of all pipes to sewer and storm water lines as shown on the drawings at ground floor level.

d) Floor and urinal traps, cleanout plugs, inlet fittings and rainwater heads.

e) Waste pipe connections from all fixture e.g Wash basin, sinks, urinals kitchen equipment and plant room equipment.

2 General Requirements

2.1 All material shall be new of the best quality conforming to specifications and subject to the approval of Architect.

2.2 Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.

2.3 Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in passages etc.

2.4 Pipes shall be securely fixed to walls by suitable clamps at specified.
2.5  Access doors for fittings and cleanouts shall be so located that they are easily accessible for repair and maintenance.

2.6  All work shall be executed as shown on the drawings.

Section C - WATER SUPPLY PIPING & INSULATION

1. Scope of Work

1.1  Work under this section consists of furnishing all labour, material equipment and appliances necessary and required to completely install the water supply system as required by the drawings, specified hereinafter and given in the Schedule of Quantities.

1.2  Without restricting to the generality of the foregoing the water supply system shall include the following:-
   a)  Providing of all new pipes, fittings and accessories.
   b)  Water distribution system to all parts of building.
   c)  Pipe protection and painting.
   d)  Control valves, masonry chamber and other appurtenances.
   e)  Connection to all plumbing fixtures, kitchen equipment, tanks and applications.
   f)  Earth work.

2. Generals Requirements

2.1  All material shall be new of the best quality conforming to specifications. All works executed shall be to the satisfaction of the Managers/Consultants.

2.2  Pipes and fittings shall be fixed truly vertical, horizontal or in slopes s required in a neat workmanlike manner.

2.3  Short or long bends shall be used on all main pipe lines as far as possible. Use of As far as possible all bends shall be formed by means of hydraulic pipe bending machine for pipes upto 65mm dia.
2.4 Valves and other appurtenances shall be located as shown on the drawings.

Section D - DRAINAGE (SEWERS & STORM WATER)

1. Scope of work

1.1 Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install the drainage system as required by the drawings and specified hereinafter.

2. General Requirements

2.1 All material shall be new of the best quality conforming to specifications and subject to the approval of the Managers/Consultants.

2.2 Drainage lines shall be laid to the required gradients and profiles.

2.3 All drainage work shall be done in accordance with the local municipal bye-laws.

2.4 Contractor shall obtain necessary approval and permission for the drainage systems from the municipal or any other competent authority.

2.5 Location of all new manholes, catch basins etc, shall be got confirmed by the Contractor from the Managers/Consultants.

SECTION - E - PIPES

1. CI PIPES AND FITTINGS:

1.1 All downtake CI Pipe ISI marked brand as per IS:13592-1992, type B ring fitted (for pipe size 110 / 75mm) complete with CI Fittings conforms to IS: 14735-99 & fittings dimensions as per DIN 19531 & DIN 19534, Rubber ring conforms to IS:5382 with necessary clamps & hinges including cutting and making good the walls The pipes are provided with an integral rubber ring type socket at one end while the other end is kept plain, smooth and free from burrs. Rubber ring type socket ends provide easy push - fit type jointing.
Simultaneously, allowance for thermal expansion can also be provided during installation.

1.2 All internal & external drainage CI PIPE ring fit pipe shall be conforming to IS:4985 including all fittings such as bends, junctions, inspection doors, offsets, cowl, access pieces/plugs etc. jointing with Solvent cement(lubricant) with O-Ring joints including cutting holes in walls and making good the same.

1.3 FITTINGS:

Fittings shall conform to the corresponding Indian Standard as for pipes. Contractor shall use pipes and fittings of matching specification.

Access door shall be secured air and water tight with 3mm thick insertion rubber washer and white lead. The bolts shall be lubricated with grease or white lead for easy removal.

Fittings shall be of the same make as that of pipes, injection moulded and shall conform to Indian Standard.

1.4 JOINTING:

The jointing of the pipes to the fittings shall be done as per the manufacturer’s instructions / recommendation. The rubber ring socket fittings and pipes shall be jointed as follows:-

Clean the outside of the pipes spigot end and the inside of the ceiling groove of the fitting.

Apply the lubricant uniformly to the spigot end, sealing ring and pass the spigot end into the socket containing sealing ring until fully home. Mark the position of the socket edge with pencil or felt open on the pipe, then withdraw the pipe from the socket by approximately 10 mm to make the pipe fully fitted to the fitting. The horizontal pipes on the wall shall be fixed with M.S. fabricated clamps with necessary provisions to take care the expansion and contraction in CI pipes. The spacing of the clamps shall be at the intervals of 1.5 meter to 2 meter depends on the requirement of the supporting arrangements. Solvent joints shall be used as per manufacturer recommendations.
Rubber Seal Rings for Joints & Access Doors: Manufactured in accordance with IS: 5382 for 75 mm / 110 mm sizes. These are made out of natural rubber with a shore ‘A’ hardness pf 40 × 5. Provide superior resistance to biological attack. Special design of cross section ensures perfect sealing. Lubricant: Available in 100 gms, 250 gms & 500 gms packing. Specially formulated for compatibility with rubber seal as well as PVC which does not support the growth of bacteria or fungi.

2. WASTE PIPE FROM APPLIANCES

2.1 Waste pipe from appliances e.g. wash basins, sinks, urinals, chrome plate where seen water coolers shall be of heavy duty GI pipes:

2.2 All pipes shall be fixed in gradient towards the outfalls of drains. Pipes inside a toilet room shall be in chase unless otherwise shown on drawings. Where required pipes may be run at ceiling level in suitable gradient and supported on structural clamps. Spacing for clamps for such pipes shall be as follows:

2.3 Vertical Horizontal
   G.I. Pipes 300 cms 240 cms
   P.V.C. Pipes 180 cms 120 cms

3. PAINTING

3.1 Soil, waste vent and rainwater pipes in exposed location, in shafts and pipe spaces shall be thoroughly cleaned to remove dirt, rust and other contamination, and painted with two or more coats of synthetic enamel paint to give an even shade.

3.2 Paint shall be of approved quality and shade, where directed pipes shall be painted in accordance with approved pipe colour code.

3.3 Waste pipes in chase shall be thoroughly cleaned to remove dirt, rust and other contamination, and painted with two coats of bitumen paint, covered with polythene tape and a final coat of bitumen paint. Exposed pipes shall be painted with two or more coats of synthetic enamel paint.
4. MEASUREMENTS:

4.1 These pipes shall be measured along the center line of the pipe including all specials in Rmt. The quoted rate for respective items shall include the following:

a) Cost of respective pipes and specials and jointing materials.
b) Laying, fixing and jointing with necessary clamps, brackets, screws, etc., and curing.
c) Making good all damages to the parts of the building to suit the surroundings.
d) Testing and making good the defects, if any

5. TRAPS

5.1 NAHANI TRAP OR FLOOR TRAPS
Nahani traps or floor traps shall be CI deep seal with an effective seal of 50 mm.

The trap and waste pipes shall be set in cement concrete blocks firmly supported on the structural floor. The blocks shall be in 1:2:3 mix (1 cement: 2 coarse sand: 4 stone aggregate 20 mm nominal size) mixed with water proof compound and extended to 40 mm below finished floor level. Contractor shall provide all necessary shuttering and centering for the blocks. Size of the block shall be 30 x 30 cms of the required depth. The trap shall be installed at lowest point ensure no pending occurs at perimeters of the drain.

5.2 FLOOR TRAP INLET
Bath room traps and connections shall ensure free and silent flow of discharging water.
Where specified, the Contractor shall provide a special type galvanised iron inlet fitting without or with one, two or three inlet sockets to receive the waste pipe. Joint between waste and fitting shall be connected to a C.I. ‘P’ or ‘S’ trap with at least 50mm seal(Hopper and traps shall be paid for separately). Floor trap inlet fittings and the trap shall be set in cement concrete blocks.

5.3 C.P./STAINLESS STEEL GRATINGS
Floor and Urinal traps shall be provided with 100-150mm square or round C.P./Stainless steel grating as approved by Client’s Representative with rim, of
approved design and shape. Minimum thickness shall be 4-5mm or as specified in the Bill of Quantities.

6. **CLEANOUT PLUGS**

Contractor shall provide cast brass cleanout plugs in all horizontal run more than 15 meter length required one cleanout plugs shall be threaded and provided with key holes for opening. Cleanout plugs shall be fixed to the pipe by a G.I. socket and lead caulked joint.

7. **PIPE SLEEVES**

Pipe sleeves 50mm larger diameter than pipes shall be provided wherever pipes pass through walls and slabs and annular space filled with fire proof materials like putty, fire seal etc. All pipes shall be accurately cut to the required sizes in accordance with relevant BIS codes and burs removed before laying. Open ends of the pipe shall be closed as the pipe is installed to avoid entrance of foreign matters. Vertical sleeve shall finish 50mm above finish floor level.
SECTION – 4

PARTICULAR TECHNICAL SPECIFICATIONS
(ELECTRICAL WORKS)
TECHNICAL SPECIFICATION
FOR ELECTRICAL WORKS

All works shall be executed, measured and paid for as per Central Public Works Department (C.P.W.D.) Specifications 2013 (for electrical works) with up to date correction / revision slips.

All market rate items should be done with best engineering practices and approval of Engineer in Charge.
NOTES:

- No specific notes provided in the image.