AN ISO 9001 & 14001 COMPANY

TENDER DOCUMENT

TENDER No: WRO/ CON/ 757/ 0227

FOR

Tender for Internal water supply, Sanitary works & Fire Fighting works for Construction of MCH & Infectious Block Building at Kendrapara, Odisha state

VOLUME - II

ACC, GCC, TECHNICAL SPECIFICATION
**ADDITIONAL CONDITIONS OF CONTRACT (ACC)**

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<th>1. <strong>General:</strong></th>
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<tr>
<td>The Additional Conditions shall be read in conjunction with General Conditions of Contract. Where the provisions of these Additional Conditions are at variance with the provision of the General Conditions of Contract, the provisions of these Additional Conditions shall take precedence.</td>
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<tr>
<th>2. <strong>Commencement and Completion of Project:</strong></th>
</tr>
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<tr>
<td>The Contractual Completion Period shall be 12 months from the 10th day of issue of Letter of Intent of Acceptance of Tender.</td>
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<tr>
<th>3. <strong>References:</strong></th>
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<tbody>
<tr>
<td>NA</td>
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<tr>
<th>4. <strong>Mobilization advance:</strong></th>
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</thead>
<tbody>
<tr>
<td>Mobilization advance shall be paid @ 10% of the contract value with interest @ 12% against non-revocable and unconditional Bank Guarantee of an equivalent amount equal to 110% of the Mobilization Advance from a Nationalized Bank / Scheduled Bank.</td>
</tr>
<tr>
<td>Recovery and other conditions as per GCC Cl No. 8</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>5. <strong>Price quoted is to be firm inclusive of all taxes and duties as per GCC Cl no. 13. No escalation is payable</strong></th>
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<th>6. <strong>Taxes and Duties:</strong></th>
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<td>The following shall be also read with clause no 13 of GCC:</td>
</tr>
<tr>
<td>1. The bidder/Contractor must be registered with GST and should have valid GSTIN number.</td>
</tr>
<tr>
<td>2. The bidder/contractor must submit as an compliances of GST Act, the invoices in GST compliant format failing which the GST amount shall be recovered/ adjusted by EPI without any prior notice from the next invoices or available dues with EPI.</td>
</tr>
<tr>
<td>3. The bidders/contractors are requested to update/upload the GST/Taxes data periodically so as to avail ITC credit by EPI failing which it shall be recovered/ adjusted by EPI without any prior notice from the next invoices or available dues with EPI.</td>
</tr>
<tr>
<td>4. Rates to be quoted in this tender all inclusive with all other taxes and duties, cess etc. including GST</td>
</tr>
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5. Bidder while quoting the rates in the tender must also consider the ITC credit applicable for the works, if any.

**VARIATION IN TAXES, DUTIES, LEVIES AND IMPOSITION OF NEW TAXES ETC.**

Not payable. Price quoted by bidder is firm till completion of work.

7. **LAND FOR LABOUR HUTS/ SITE OFFICE AND STORAGE ACCOMMODATION**

In addition to GCC Clause no 28.1,
- It is bidder responsibility to acquire the land for on its own cost of following
  1. Labour Hutment
  2. Steel Yard
  3. Batching Plant
  4. Cement Godown
  5. Storage unit
  6. Site Establishment

8. **WATER AND ELECTRICITY**

   a) The Contractor shall make his own arrangement for Water & Electrical power for construction and other purposes at his own cost and if EPIL is providing necessary charges shall be deducted towards electricity and water. The Contractor shall also make standby arrangement for water & electricity to ensure un-interrupted supply.
   
   b) Security is provided by EPIL at site, however charges shall be deducted on prorata basis to the scope of work of the contractor.

9. **Secured Advance:**

   Secured Advance payable as per GCC

10. **Payment:**

   RA Bill must be accomplish by progress photos, All other terms of GCC Cl no 37.2 remains same.

   Client is releasing payment to EPI stage wise and payment to contractor shall be released considering stage payment and as per billing schedule.

   In addition to clause no 37.2 of GCC, all payment shall be released by NEFT/RTGS
11. **Bar Chart:**

The Contractor shall also furnish within 10 days from the date of letter of Intent, a Bar Chart on MS Projects for completion of work with in stipulated time. This will be duly got approved from EPI. This approved MSP Chart shall form a part of the agreement. Achievement of milestones as well as total completion has to be within the time period allowed.

12. **Works to Be Open to Inspection:**

All works executed or under the course of execution in pursuance of this contract shall at all times be open to inspection and supervision of EPI. The work during its progress or after its completion may also be inspected, by Chief Technical Examiner of Government of India (CTE) and/or an inspecting authority of State Government of State in which work is executed and/or by third party checks by Owner/ Clients. The compliance of observations/ improvements as suggested by the inspecting officers of EPI/CTE/ State authorities/ Owners shall be obligatory on the part of the Contractor at the cost of Contractor.

*Any recovery, penalty imposed by CTE due to non-performance, non-compliance of agreed condition or otherwise whatsoever the same shall be recovered from RA Bill of contractor.*

13. **Materials Procured With the Assistance of EPI:**

If any material for the execution of this contract is procured with the assistance of EPI either by issue from its stores or purchase made under orders or permits or licenses obtained by EPI, the Contractor shall hold and use the said materials economically and solely for the purpose of this contract and shall not dispose them without the written permission of Engineer-In-Charge. The Contractor, if required by EPI, shall return all such surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination on whatsoever reason, on being paid or credited such price as EPI shall determine having due regard to the conditions of materials.

*All the materials are deemed to be in scope of contractor and shall be arranged by him, however if any such material is procured with assist of EPI, a handling charges of 10% plus GST on actual purchase cost shall be levied and recovered from RA bills of contractors.*

14. **Defect Liability Period:**

Defect Liability Period is 36 Months from the date of certification of completion of this work; all other condition of GCC Clause No 74 is remains same.
15. **ARBITRATION:**

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<th>General Conditions of Contract (GCC) Sub Clause no.76.1 and 76.3 of Arbitration Clause no.76.0 are amended as given below. Sub Clause no.76.2 will remain the same.</th>
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<td>76.0 ARBITRATION</td>
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<td>76.1 Before resorting to arbitration as per the clause given below, the parties if they so agree may explore the possibility of conciliation as per the provisions of Part III of the Arbitration and Conciliation Act, 1996 as amended by Arbitration and Conciliation (Amendment) Act, 2015. When such conciliation has failed, the parties shall adopt the following procedure for arbitration:</td>
</tr>
<tr>
<td>i) Except where otherwise provided for in the contract, any disputes and differences relating to the meaning of the Specifications, Design, Drawing and Instructions herein before mentioned and as to the quality of workmanship or materials used in the work or as to any other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the Contract, Designs, Drawings, Specifications, Estimates, Instructions, or these conditions or otherwise concerning the works of the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the Sole Arbitrator appointed by the Chairman &amp; Managing Director (CMD) of Engineering Projects (India) Limited (EPI) or any other person discharging the functions of CMD of EPI. The person approached for appointment as Arbitrator shall disclose in writing circumstances, in terms of Sub-Section (1) of Section (12) of the Arbitration and Conciliation Act, 1996 as amended by Arbitration and Conciliation (Amendment) Act, 2015 as follows:</td>
</tr>
<tr>
<td>a) such as the existence either direct or indirect, of any past or present relationship with or interest in any of the parties or in relation to the subject-matter in dispute, whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to his independence or impartiality; and</td>
</tr>
<tr>
<td>b) which are likely to affect his ability to devote sufficient time to the arbitration and in particular his ability to complete the entire arbitration within a period of twelve months. The Arbitrator shall be appointed within 30 days of the receipt of letter of invocation of arbitration duly satisfying the requirements of this clause.</td>
</tr>
<tr>
<td>ii) if the arbitrator so appointed resigns or is unable or unwilling to act due to any reason whatsoever, or dies, the Chairman &amp; Managing Director aforesaid or in his absence the person discharging the duties of the CMD of EPI may appoint a new</td>
</tr>
</tbody>
</table>
arbitrator in accordance with these terms and conditions of the contract, to act in his
place and the new arbitrator so appointed may proceed from the stage at which it
was left by his predecessor.

iii) It is a term of the contract that the party invoking the arbitration shall specify the
dispute/ differences or questions to be referred to the Arbitrator under this clause
together with the amounts claimed in respect of each dispute.

iv) The Arbitrator may proceed with the arbitration ex-parte, if either party, in spite of
a notice from the arbitrator, fails to take part in the proceedings.

v) The work under the contract shall continue as directed by the Engineer-In-Charge,
during the arbitration proceedings.

vi) Unless otherwise agreed, the venue of arbitration proceedings shall be at the
venue given in the ‘Memorandum’ to the ‘Form of Tender’.

vii) The award of the Arbitrator shall be final, conclusive and binding on both the
parties.

viii) Subject to the aforesaid, the provisions of the Arbitration and Conciliation Act,
1996 as amended by Arbitration and Conciliation (Amendment) Act, 2015 or any
statutory modifications or re-enactment thereof and the Rules made there under and
for the time being in force shall apply to the arbitration proceedings and Arbitrator
shall publish his Award accordingly.

76.3 JURISDICTION:
The courts in Mumbai alone will have jurisdiction to deal with matters arising from the
contract.

16. Variation:

**Change of Scope (Variations) and Procedure for change of Scope:**

1. The Employer may, require the Contractor to make modifications/alterations to the
construction works before the issue of the completion certificate either by giving an
instruction or by requesting the contractor to submit a proposal for change of scope
involving additional cost or reduction in cost. Any such change of scope shall be made
and valued in accordance with the provisions of this contract and the contractor, in
that event, will have no further claim.

2. Change in scope may include;

(a) Change in specifications of any item of works
(b) omission/ deletion of any item of work from the scope of work

(c) any additional work which are not included in the scope of work including any additional test on completion

3. In the event of the Employer determining that a change of scope is necessary, it shall issue notice to the contractor a notice specifying in reasonable detail the works contemplated there under (“Change in scope notice”)

4. The quantity may vary +/- 25% and the rates quoted are to be firm for the total work and overall deviation as per GCC.

5. Employer may instructed to execute similar items in other buildings for this project and the rates quoted are to be firm.

17. **FURNISHED OFFICE ACCOMMODATION & MOBILITY AND COMMUNICATION TO BE PROVIDED BY THE CONTRACTOR TO EPI:**

   DELETED

18. **Insurance:**

   In addition to GCC clause no. 17 is modify as under

   EPI shall take Contractor All Risks (CAR) policy for the whole project. THE CONTRACTOR shall assist EPI in follow up with insurance company in case of any claim related to CONTRACTOR’s scope of work. EPI is not liable to pay any claim of the CONTRACTOR of it is not paid by insurance company due to any reasons whatsoever.

   **Workmen’s Compensation Policy**

   Contractor has to obtain workmen compensation Policy for the scope of work till completion of project & DLP

19. **Labour:**

   The Contractor shall, unless otherwise provided in the GCC Clause reference, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

   The contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Engineer may require.

   The CONTRACTOR shall also be responsible for labour welfare and for arranging labour and other licenses/permits/clearance etc. for the project at their own. In case EPI has to take labour license or and other licenses, all expenditure towards the same
shall also be borne by the CONTRACTOR. 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.

20. **COMPLIANCE WITH LABOUR REGULATIONS:**

During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and by e laws of the State or Central Government or local authority and any other labour law (including rules), regulations, by elaws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to construction industry are given below. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made there under, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer/Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer. The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

INBUILDING AND OTHER CONSTRUCTION WORK.

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK.

- **a) Workmen Compensation Act 1923:** The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

- **b) Payment of Gratuity Act 1972:** Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years’ service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

- **c) Employees P.F. and Miscellaneous Provision Act 1952:** The Act Provides for monthly contributions by the employer plus workers @ 10% or 8.33%. The
benefits payable under the Act are:

(i) Pension or family pension on retirement or death, as the case may be.

(ii) Deposit linked insurance on the death in harness of the worker.

(iii) Payment of P.F. accumulation on retirement/death etc.

(iv) Contractors are assigned to submit copy of “ECR” Electronic challan fees of the PF Deposited by 20th of next month.

d) Maternity Benefit Act 1951:- The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

e) Contract Labour (Regulation & Abolition) Act 1970:- The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.

f) Minimum Wages Act 1948:- The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, and Runways are scheduled employments.

g) Payment of Wages Act 1936:- It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

h) Equal Remuneration Act 1979:- The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

i) Payment of Bonus Act 1965:- The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/-per month or less. The bonus to be paid to employees getting Rs.2500/- per month or above up to Rs.3500/- per month shall be worked out by taking wages as Rs.2500/-per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.
j) Industrial Disputes Act 1947:- The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

k) Industrial Employment (Standing Orders) Act 1946:- It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.

l) Trade Unions Act 1926:- The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.


n) Inter-State Migrant workmen’s (Regulation of Employment & Conditions of Service) Act 1979:- The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home up to the establishment and back, etc.

o) The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996:- All the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the workplace etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

p) Factories Act 1948:- The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions,
working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

21. The CONTRACTOR shall be fully responsible to complete the “Works” in workmen like manner to the satisfaction of the Client and EPI by maintaining high standard of quality and precision as per ‘Tender Documents,’ Agreements, Terms & Conditions, Specifications, Drawings etc. within contractual completion period and within their quoted rates/ amount. The rates quoted/finalized shall remain firm throughout till completion of works including the extend period for which Extension shall be granted by EPI without Levy of L.D & in no case rate shall be revised.

22. In case the project execution is delayed beyond the contractual scheduled completion period due to any reason attributable to the Contractor, the staff and site office expenses of EPI for extended period shall be paid by the CONTRACTOR to EPI at the rate of Rs. 1,00,000/- per month. This shall be in addition to the facilities provided by the CONTRACTOR to EPI and the Liquidated Damages/ Compensation for delay/Penalties etc. as per contract.

23. The CONTRACTOR shall be responsible for obtaining all approvals from Client with regard to quality of materials & workmanship and measurements etc. for their portion of work. All such approvals shall be in the name and title of EPI. The CONTRACTOR shall be responsible for reconciliation of issued material as per CPWD norms. Any shortfall in issue materials shall be made good/recovered from CONTRACTOR at actual expenditure.

24. The CONTRACTOR will not deal directly with Client and all the correspondence in matters regarding bills, claims, interpretation of the specifications, conditions and all matters related to the contract with Client, Client’s Consultants, all other agencies including Government and Statutory bodies etc. shall be done through EPI only. CONTRACTOR shall prepare and submit expeditiously all bills, claims, details, clarifications, documents, information, etc. as required by EPI /Client for proper execution and successful completion of the “Works”

25. If desired by EPI, CONTRACTOR shall be available/associate with EPI in meetings with Client for its portion of work. CONTRACTOR shall furnish all information and clarifications as and when required by EPI/Client.

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

27. The CONTRACTOR shall deploy sufficient plant & equipment of the required 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 by the Client, 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 10% overheads of EPI and shall recover the same from the due payments of CONTRACTOR, including from its bank guarantees Retention money /other dues available with EPI.

28. **PRIORITY OF WORK:**

The contractor has to deploy resources and plan the work accordingly and nothing extra shall be payable to the contractor on this account. The contractor has to ensure safety of the occupants and sufficiently barricade the area so as to avoid any hazard to occupants.

29. If any tenderer withdraws his tender before the said period or issue of letter of acceptance/intent, whichever is earlier, or makes any modifications in the terms and conditions of the downloaded tender which are not acceptable to the EPIL, then the EPIL shall, without prejudice to any other right or remedy, be at liberty to forfeit entire amount of Earnest Money as aforesaid.

30. The final bill will be submitted by the contractor within 60 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) Drawings for layout of underground cables and details showing location of sluice valves, electric cable joints etc.
h) All operation and maintenance manuals.

i) 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.

j) Manufacture’s guarantee of various machines / equipment’s installed as part of works.

k) NOC from labour department, PF Department.

31. The party shall be responsible for the quality of material used, and all test as per Technical specification. Sample approvals for the material to be used as per the approved vendors per the BOQ to be obtained. Any Third party test to be made from outside Govt. lab is to be done at any time without any extra cost.

Contractor has to get mock up approval for all fittings and fixtures if required without any extra cost.

However, all the tests other than the field test which are to be done as per tender document and specifications will be arranged by the respective party and all expenses etc. shall be borne by the respective party and nothing will be paid/reimbursed to party by EPI.

32. **Requirement of Technical Staff**

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<th>Minimum experience (Years)</th>
<th>Rate of recovery in case compliance</th>
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<td>(i) Project Manager with degree in Civil Engineering Experience in PHE work &amp; FF work</td>
<td>1</td>
<td>10</td>
<td>Rs. 50,000/-p.m.</td>
</tr>
<tr>
<td>(ii) Engineer for Quality control</td>
<td>1</td>
<td>5</td>
<td>Rs. 25,000/-p.m.</td>
</tr>
<tr>
<td>(iii) Diploma holder/ Supervisors</td>
<td>Sufficient</td>
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ENGINEERING PROJECTS (INDIA) LIMITED
(A Govt. of India Enterprise)

INSTRUCTIONS TO TENDERERS
ENGINEERING PROJECTS (INDIA) LIMITED

(A Govt. of India Enterprise)

INSTRUCTIONS TO TENDERERS

1.0 MODE OF SUBMISSION

The Tender is to be submitted in two separate sealed covers marked as under:

ENVELOPE-1 :-

This ENVELOPE shall contain the following:

i) Earnest Money Deposit as per clause 2.0 of 'Instructions to Tenderers' (ITT).
ii) Letter of Undertaking for un-conditional acceptance of the tender conditions as per proforma given in ITT.
iii) Pre-Qualification Documents and Credentials as per clause 19.0 of ITT.
iv) Volume-I (ITT, General Conditions of Contract), Volume-II (Notice Inviting Tender, Additional Conditions of Contract, Specifications, Drawings) and Corrigendum/ Addendum, if any, duly filled in, signed and stamped on each page by tenderer. Cutting or over-writing, if any, shall be signed and stamped by the person signing the Tender. All pro-forma forming part of Tender Documents shall be filled in, signed and stamped by the tenderer.
v) Copy of power of attorney / partnership deed, duly attested by Notary Public authorizing the person who signs the Tender.
vii) Any other information as required to be submitted along-with the Tender.

This envelope shall be marked as:

ENVELOPE-1 “TECHNO-COMMERCIAL BID” FOR (Name of work as mentioned in “Notice Inviting Tender”)

NIT No. :
DUE ON :
FROM : (Name of the Contractor)

ENVELOPE – 2 :-

This ENVELOPE shall contain only the Volume-III comprising of PRICE-BID.

This envelope shall be marked as:

ENVELOPE-2 : ‘PRICE-BID’ FOR (Name of Work as mentioned in “Notice Inviting Tender”)

NIT No. :
DUE ON :
FROM : (Name of the Contractor)
Both the envelopes / packets shall be individually sealed and kept in an outer envelope marked as :

**TENDER FOR** (Name of Work as mentioned in “Notice Inviting Tender”)

**NIT No.** : __________________________________

**DUE ON** : __________________________________

**FROM** : (Name of the Contractor)

The outer envelope shall be duly sealed and shall be delivered at place of submission of Tender by the date and time fixed for receipt of Tender as mentioned in “Notice Inviting Tender”. The Tenders received after the date and time of Tender receipt shall not be considered and shall be returned to the tenderer unopened. EPI shall not be responsible for any postal or other delays, whatsoever and tenderer should take care to ensure the submission of Tender at place of receipt of Tender by due date and time fixed for Tender receipt. **All the envelopes shall be addressed to the** authority who has invited the Tender as mentioned in “Notice Inviting Tender”.

1.1 First the Envelope-1 of the tenderer shall be opened. Tenderers who unconditionally accept the tender conditions, deposit the required Earnest Money and whose Techno-Commercial Bid along with PQ Documents is found suitable shall be considered for the opening of their Price Bid and Envelope-2 of such tenderers shall only be opened. The Tenders not accompanied by requisite Earnest Money and / or not conveying un-conditional acceptance of tender conditions or whose Techno-Commercial Bid and PQ Documents are not found suitable, shall be rejected and such tenderer shall not be allowed to attend Price Bid opening i.e. opening of Envelope-2.

1.2 Once the tenderer has given an unconditional acceptance to the tender conditions in its entirety, he is not permitted to put any remark(s) / condition(s) (except unconditional rebate on price, if any) in / along with the ‘Price-Bid’ / Tender.

1.3 In case the condition 1.2 mentioned above is found violated at any time after opening of Tender, the Tender shall be summarily rejected and EPI shall, without prejudice to any other right or remedy, be at liberty to forfeit the full said Earnest Money absolutely.

2.0 **EARNEST MONEY DEPOSIT**

Earnest Money Deposit of amount as mentioned in “NIT/ITT/Memorandum” to “Form of Tender” required to be submitted alongwith the Tender shall be in the form of Demand Draft payable at place as mentioned in “NIT/ITT” in favour of EPI Limited from any Nationalized / Scheduled Bank or in the form of Bank Guarantee from any Nationalized / Scheduled Bank in enclosed format. The EMD Bank Guarantee shall be valid for a minimum period of 150 (One Hundred Fifty) days from last day of submission of Tender. The EMD shall be governed by Clause 7.0 of General Conditions of Contract.

3.0 EPI reserves the right to reject any or all the Tenders in part or full without assigning any reason whatsoever thereof. EPI does not bind themselves to
accept the lowest Tender. EPI reserves the right to award the work to a single party or to split the work amongst two or more parties as deemed necessary without assigning any reason thereof. The Contractor is bound to accept the portion of work as offered by EPI after split up at the quoted / negotiated rates.

4.1 **FOR ITEM RATE TENDERS**

4.1.1 The tenderers should quote the rates for items tendered by them in figures as well as in words and the amounts in figures only. The amount for each item should be worked out and the requisite totals and page totals given.

4.1.2 All corrections/cuttings should be signed by the tenderer. Each page of the Tender should be signed by the tenderer. In the event of discrepancy between rate in figures and words the rate quoted in words shall be treated as correct. In case there is discrepancy between rate and amount worked out, the rate quoted shall be taken as correct and not the amount.

4.1.3 Price shall be entered against each item in Bill of Quantities where quantities or LS (lump-sum) has been mentioned. The cost of item against which the Contractor has failed to enter a rate or price shall be deemed to be covered by rates and prices of other items in the Bill of Quantities and no payment shall be made for the quantities executed for items against which rate has not been quoted by Contractor. No rate is to be quoted against items for which no quantity is given. However, the Contractor has to quote rate against "LS" items.

4.2 **FOR PERCENTAGE RATE TENDERS**

4.2.1 In case of Percentage Rate Tenders, tenderer shall fill up in the Schedule / Bill of Quantities, percentage Below/Above/Par (in figures as well as in words) to total estimated cost given in Schedule / Bill of Quantities, he will be willing to execute the work. The tenderer should quote a unique single percentage plus / minus over the total estimated amount given in Schedule / Bill of Quantities. In case more than one schedule is given, stipulating quoting of separate percentages (plus or minus) over the estimated amount of each schedule, the tenderer can quote separate percentages for each such schedule. Under no circumstances, tenderer is allowed to quote separate percentages for individual items, trades or group of items. In case tenderer quotes separate percentages for individual items, trades or group of items instead of to the total amount of schedule(s), the Tender shall be rejected and earnest money of the tenderer shall be forfeited in totality.

4.2.2 In case of Percentage Rate Tenders, the tenderer shall also work out the total amount of his offer after adding percentage (plus or minus) over the total schedule amount and the same should be written in figures as well as in words in such a way that no interpolation is possible.

4.2.3 In case of Percentage Rate Tenders, only percentage quoted shall be considered. Any tender containing item rates is liable to be rejected. Percentage quoted by the tenderer in Percentage Rate Tender shall be accurately filled in figures and words. All corrections/cuttings should be signed by the tenderer. Each page of the Tender should be signed by the tenderer. In the event of discrepancy between percentage rate in figures and words, the percentage rate
quoted in words shall be treated as correct. In case there is discrepancy between percentage rate and amount worked out the percentage rate quoted shall be taken as correct and not the amount. For any other discrepancy, the decision of Tender Scrutiny Committee of EPI shall be final & binding on the tenderer including rejection of Tender and forfeiture of EMD.

5.0 The Tenders shall be strictly as per the conditions of contract. Tenders with any additional condition(s)/modification(s) shall be rejected.

6.0 The witnesses to the Tender / Contract Agreement shall be other than the tenderer / tenderers competing for this work and must indicate full name, address, status/occupation with dated signatures.

7.0 The acceptance of Tender will rest with EPI. Tenders in which any of the prescribed conditions are not fulfilled or found incomplete in any respect are liable to be rejected.

8.0 Canvassing whether directly or indirectly in connection with Tenders is strictly prohibited and the Tenders submitted by the Contractors who resort to canvassing will be liable to rejection.

9.0 On acceptance of Tender, the name of the accredited representative(s) of the Contractor who would be responsible for taking instructions from Engineer-In-Charge or its authorised representative shall be intimated by the Contractor with in 07 days of issue date of telegram / letter / telex / fax of Intent by EPI.

10.0 The tenderer shall not be permitted to Tender for works if his near relative is posted as an Assistant Manager or any higher ranks in the concerned Regional Office of EPI. The Contractor 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 of the officers in EPI. Any breach of this condition by the tenderer would render him liable to the withdrawal of the work awarded to him and forfeiture of Earnest Money and Security Deposit. This may also debar the Contractor from tendering for future works under EPI.

11.0 No employee of EPI of the rank of Assistant Manager and above is allowed to work as a Contractor or as an employee of a Contractor having interest in EPI for a period of two years after his retirement/relief from the service of EPI, without the prior permission of EPI in writing. This contract is liable to be cancelled if either the Contractor or any of his employee is found at any time to be such a person who had not obtained the permission of EPI as aforesaid before submission of the Tender or engagement in the Contractor’s service.

12.0 The time of completion of the entire work, as contained in contract shall be as mentioned in “Memorandum” to “Form of Tender”, which shall be reckoned from the 10th day from issue of the Letter / Telex / Telegram / Fax of Intent by the EPI.

13.0 The Tender award, execution and completion of work shall be governed by Tender Documents consisting of (but not limited to) Letter of Intent / Letter of work Order, Bill of Quantities, Additional Conditions of Contract, General Conditions of Contract, Specifications, Drawings, etc. The tenderers shall be
deemed to have gone through the various conditions and clauses of the Tender and visited the Site and satisfied itself with Site conditions including sub-soil water conditions, topography of the land, drainage and accessibility etc. or any other condition which in the opinion of Contractor will affect his price / rates before quoting their rates. No claim whatsoever against the foregoing shall be entertained by EPI.

14.0 The Drawings given with the Tender Documents are TENDER DRAWINGS and are indicative only.

15.0 Transfer of bid documents purchased by one intending bidder to another is not permissible.

16.0 Tenders must be duly signed with date and sealed. An attested copy of power of attorney/affidavit/Board Resolution executed as under shall accompany the ‘Tender Documents’.

   a) In case of Sole Proprietorship, an affidavit of Sole Proprietorship and if the Tender is signed by any other person Power of Attorney by the Sole Proprietor in favour of signatory.

   b) In case of Partnership firm, if Tender is not signed by all the partners, Power of Attorney in favour of the Partner/person signing the tender/documents by all the partners authorizing him to sign the tender/documents.

   c) In case of Company, copy of the Board Resolution authorizing the signatory to sign on behalf of the Company.

17.0 Tenders with following discrepancies are liable for rejection:

   a) Tenders with over-written or erased rates, percentages, amounts or rates, percentages not written in both figures and words.

   b) Tender that is incomplete, ambiguous, and not accompanied by the documents asked for or submitted without EMD or with inadequate EMD.

   c) Tender received after specified date/time whether due to postal or other delays.

   d) Tender in respect of which canvassing in any form is resorted to by the tenderer whatsoever.

   e) If the tenderer deliberately gives wrong information in his tender or resorts to unfair methods in creating circumstances for the acceptance of his tender, EPI reserves the right to reject such tender at any stage.

18.0 Submission of a tender by the tenderer implies that he has read the complete contract documents and has made himself aware of the scope, terms & conditions and specifications of the work to be done and of conditions at which stores, tools, plant, etc. will be issued to him by EPI (if any), local conditions and
political situations and other factors having bearing on the execution of the works. No claim of Contractor whatsoever, within the purview of this clause, shall be entertained at any stage of the project.

19.0 Tenderer shall submit the following documents along with their Tenders in the first envelope (Techno-Commercial Bid):-

a) List of works executed during the last 5 years indicating name of the Client, value, date of start and completion.
b) List of works under execution indicating name of the Client, Total Contract Value, Value of balance work in hand, date of start and completion.
c) Details of similar works executed.
d) Audited balance sheets and profit and loss accounts along with schedules for the last 3 years.
e) Copy of latest income-tax returns filed along with PAN.
f) Details of manpower available.
g) Details of equipments, tools and plant available.
h) Credentials and completion certificates.
i) Registration Certificate/Memorandum and Articles of Association/Partnership Deed/Affidavit.
j) Copy of Provident Fund Number allotted by PF authorities.
k) Copy of letters of registration with various authorities like CPWD, State PWD, MES and Public Sector Undertakings, etc.
l) Latest Solvency certificate from Nationalised/Scheduled Bank.
m) Latest Sales Tax Registratin and Clearance Certificate.
n) Any other document as stipulated above and in “Tender Documents’

20. Purchase Preference may be granted to the Central Public Sector Enterprises as per the applicable guidelines in force in this regard issued by the Government of India.
LETTER OF UNDERTAKING

(TO BE ENCLOSED IN ENVELOPE-1 ALONGWITH EMD)

ENGINEERING PROJECTS (INDIA) LIMITED
(Address of submission as mentioned in “Notice Inviting Tender”)

REF. : TENDER FOR (Name of Work as mentioned in “Notice Inviting Tender”)

NIT No. : ________________________________

Sir,

UNDERTAKING FOR ACCEPTANCE OF TENDER CONDITIONS

1. The Tender Documents for the work as mentioned in “Memorandum” to “Form of Tender” have been issued to me / us by ENGINEERING PROJECTS (INDIA) LIMITED and I / We hereby unconditionally accept the tender conditions and Tender Documents in its entirety for the above work.

2. The contents of clause 1.2 and 1.3 of the Tender Documents (Instructions to Tenderers) have been noted wherein it is clarified that after unconditionally accepting the tender conditions in its entirety, it is not permissible to put any remark(s) / condition(s) (except unconditional rebate on price, if any) in the ‘Price-Bid’ enclosed in “Envelope-2” and the same has been followed in the present case. In case this provision of the Tender is found violated at any time after opening “Envelope-2”, I / We agree that my/our tender shall be summarily rejected and EPI shall, without prejudice to any other right or remedy be at liberty to forfeit the full said Earnest Money absolutely.

3. The required Earnest Money for this work is enclosed herewith.

Yours faithfully,

(Signature of the Tenderer)

Seal of Tenderer

Dated : ________________________
FORM OF TENDER

To,

Engineering Projects (India) Limited
(Address of submission as mentioned in “Notice Inviting Tender”)

REF. : TENDER FOR (Name of Work as mentioned in “Notice Inviting Tender”)

NIT No. : ______________________________

1. I/We hereby tender for execution of work as mentioned in “Memorandum” to this “Form of Tender” as per Tender Documents within the time schedule of completion of work as per separately signed and accepted rates in the Bill of Quantities quoted by me / us for the whole work in accordance with the Notice Inviting Tender, Conditions of Contract, Specifications of materials and workmanship, Bill of Quantities Drawings, Time Schedule for completion of jobs, and other documents and papers, all as detailed in Tender Documents.

2. It is agreed that the time stipulated for jobs and completion of works in all respects and in different stages mentioned in the “Time Schedule for completion of jobs” and signed and accepted by me/us is the essence of the contract. I/We agree that in case of failure on my/our part to strictly observe the time of completion mentioned for jobs and the final completion of works in all respects according to the schedule set out in the said “Time Schedule for completion of jobs” and stipulations contained in the contract, the recovery shall be made from me/us as specified therein. In exceptional circumstances extension of time which shall always be in writing may, however be granted by EPI at its entire discretion for some items, and I/We agree that such extension of time will not be counted for the final completion of work as stipulated in the said “ Time schedule of completion of jobs”.

3. I/We agree to pay the Earnest Money, Security Deposit cum Performance Guarantee, Retention Money and accept the terms and conditions as laid down in the “Memorandum” to this “Form of Tender”.

4. Should this Tender be accepted, I/We agree to abide by and fulfill all terms and conditions referred to above and as contained in Tender Documents elsewhere and in default thereof, allow EPI to forfeit and pay EPI, or its successors or its authorized nominees such sums of money as are stipulated in the Tender Documents.

5. I/We hereby pay the earnest money amount as mentioned in the “Memorandum” to this “Form of Tender” in favour of Engineering Projects (India) Limited payable at place as mentioned in the “NIT/ITT”.

______________________________
Signature of Contractor

______________________________
EPI
6. If I/we fail to commence the work within 10 days of the date of issue of Letter of Intent and / or I/We fail to sign the agreement as per Clause 84 of General Conditions of Contract and/or I/We fail to submit Security Deposit cum Performance Guarantee as per Clause 9.0 & 9.1 of General Conditions of Contract, I/We agree that EPI shall, without prejudice to any other right or remedy, be at liberty to cancel the Letter of Intent and to forfeit the said earnest money as specified above.

7. I/We are also enclosing herewith the Letter of Undertaking on the prescribed pro-forma as referred to in condition of NIT.

Date the __________________________ day of _______________________________

SIGNATURE OF TENDERER

NAME (CAPITAL LETTERS) : _________________________________________

OCCUPATION _________________________________________

ADDRESS _______________________________________

_______________________________________

SEAL OF TENDERER
MEMORANDUM

(ENCLOSURE TO FORM OF TENDER)

REF. : TENDER FOR (Name of Work as mentioned in “Notice Inviting Tender”)

NIT No. : ________________________________

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Cl. No.</th>
<th>Values / Description to be applicable for relevant clause(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Name of work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii)</td>
<td>Owner/Client / Employer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii)</td>
<td>Type of Tender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv)</td>
<td>Earnest Money Deposit</td>
<td>NIT</td>
<td>Rs.________ (Rupees___________________ ______________________ only).</td>
</tr>
<tr>
<td>v)</td>
<td>Estimated Cost</td>
<td>NIT</td>
<td>Rs.________ (Rupees___________________ ______________________ only).</td>
</tr>
<tr>
<td>vi)</td>
<td>Time for completion of work</td>
<td>NIT</td>
<td>Total work to be completed in _____________________________ (____________________) in accordance with the time schedule of completion of work in the Tender Documents.</td>
</tr>
<tr>
<td>vii)</td>
<td>Mobilization Advance</td>
<td>8.0</td>
<td>_____ % (______________ Percent) of Contract Value.</td>
</tr>
<tr>
<td>viii)</td>
<td>Interest Rate on Mobilization Advance</td>
<td>8.0</td>
<td>Simple Interest Rate of <em><strong><strong>%(</strong></strong></em>_____ percent only) per annum.</td>
</tr>
<tr>
<td>ix)</td>
<td>Number of Instalments for recovery of Mobilisation Advance</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>x)</td>
<td>Schedule of Rates applicable</td>
<td>69.0</td>
<td>Civil Works : __________________________ Sanitary Works : __________________________ Electrical Works : __________________________</td>
</tr>
<tr>
<td>xi)</td>
<td>Validity of Tender</td>
<td>4.0</td>
<td>90 (Ninety) Days</td>
</tr>
<tr>
<td>xii)</td>
<td>Security Deposit cum Performance Guarantee</td>
<td>9.0</td>
<td>5.00% (Five Percent only) of Contract Value within 10 days from the date of issue of telegram / letter / telex / FAX of Intent of acceptance of Tender.</td>
</tr>
</tbody>
</table>
### XIII) Retention Money
10.0
5.00% (Five percent only) of the contract amount, which shall be deducted in the manner set out in this contract.

### XIV) Time allowed for starting the work
43.0
The date of start of contract shall be reckoned 10 days from the date of issue of telegram / letter / telex / FAX of Intent of acceptance of Tender.

### XV) Defect Liability Period
74.0
12 (Twelve) Months from the date of taking over of works.

### XVI) Arbitration
76
Arbitration shall be as per provisions of Clause no.76 of GCC. The Venue of Arbitration shall be ………………………………

### XVII) Jurisdiction
76.3
Courts in -------------------------------

### SIGNATURE OF TENDERER

**NAME (CAPITAL LETTERS):**

________________________________________________________________________

**OCCUPATION**

________________________________________________________________________

**ADDRESS**

________________________________________________________________________
ENGINEERING PROJECTS (INDIA) LIMITED
(A Govt. of India Enterprise)

GENERAL CONDITIONS OF CONTRACT
AND
LABOUR SAFETY PROVISIONS, MODEL RULES
CONTRACTOR’S LABOUR REGULATIONS
& PRESCRIBED PROFORMAS
GENERAL CONDITIONS OF CONTRACT

1.0 GENERAL

The Contract means the documents forming the Tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of EPI and the Contractor, together with the documents referred to therein including these conditions, the Specifications, Designs, Drawings and Instructions issued from time to time by the Engineer-In-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.

1.1 In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them.

1.2 Engineering Projects (India) Limited, hereinafter called ‘EPI’ proposes to get the works executed as mentioned in the Contract on behalf of Owner/Client.

1.3 The work will be executed as per Drawings “GOOD FOR CONSTRUCTION” to be released by EPI unless otherwise specified elsewhere in the Tender Documents.

1.4 OTHER DEFINITIONS

a) ENGINEER-IN-CHARGE means the Regional Office In-Charge of EPI himself or an engineer of EPI nominated by the Regional Office In-Charge for supervision and/or project management of the project from time to time.

b) WORKS OR WORK The expression works or work shall unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.

c) CONTRACTOR The Contractor shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.

d) DRAWINGS mean the Drawings referred to in the Bill of Quantities, specifications and any modifications of such Drawings or such other Drawings as may from time to time be approved or furnished by EPI.

e) SITE means the lands and other places on, under, in or through which the works are to be executed or carried out and any other lands or places provided by EPI or used for the purpose of the agreement.

f) APPROVAL means approved in writing including subsequent written confirmation of previous verbal approval.
g) WRITING means any manuscript typed, written or printed statement under or over signature and/or seal as the case may be.

h) MONTH means English Calendar month. ‘Day’ means a Calendar day of 24 Hrs each.

i) CONTRACT VALUE means the sum for which the Tender is accepted as per the Agreement/ Letter of Acceptance/ Letter of Intent.

j) LANGUAGE: All documents and correspondence in respect of this contract shall be in English Language. In case of any discrepancy between the English version and the Hindi version of these documents, the provisions contained in the English version shall be applicable.

k) BILL OF QUANTITIES or SCHEDULE OF QUANTITIES means the priced and completed Bill of Quantities or Schedule of Quantities forming part of the Tender.

l) OWNER/ CLIENT / EMPLOYER means the Government, Organization, Authority, Company, Ministry, Department, Society, Cooperative etc. who has awarded the work/ project to EPI and/ or appointed EPI as Implementing / Executing Agency/ Project Manager and/ or for whom EPI is acting as an agent and on whose behalf EPI is entering into the contract and getting the work executed.

m) IMPLEMENTING/ EXECUTING AGENCY means EPI

n) TENDER means the Contractor’s priced offer to EPI for the execution and completion of the work and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Intent or Award letter. The word TENDER is synonymous with Bid and the word TENDER DOCUMENTS with “Bidding Documents” or “offer documents”.

o) The headings in the clauses/ conditions of Tender Documents are for convenience only and shall not be used for interpretation of the clause/ condition.

p) Words imparting the singular meaning only also include the plurals and vice versa where the context requires. Words imparting persons or parties shall include firms and corporations and organizations having legal capacities.

q) APPROVED INSURANCE COMPANY means any Insurance Company registered with ‘Insurance Regulatory & Development Authority’ (IRDA) of India and meeting insurance needs of the projects of EPI.

2.0 SITE VISIT AND COLLECTING LOCAL INFORMATION

Before tendering, the tenderer is advised to visit the Site, its surroundings to assess and satisfy themselves about the local conditions such as the working and other constraints at Site, approach roads to the Site, availability of water & power supply, applicability of taxes, duties and levies etc., nature of ground, soil and sub-soil condition, underground water table level, accommodations they may
require etc., river regime, river water levels, other details of river, streams & any other relevant information required by them to execute the complete scope of work. The tenderer may obtain all necessary information as to risks, weather conditions, contingencies & other circumstances (insurgencies etc.) which may influence or affect their tender prices. Tenderer shall be deemed to have considered Site conditions whether he has inspected it or not and to have satisfied himself in all respects before quoting his rates and no claim or extra charges whatsoever in this regard shall be entertained / payable by EPI at a later date.

2.1 ACCESS BY ROAD

Contractor, if necessary, shall build temporary access roads to the actual Site of construction for the works at his own cost to make the Site accessible. The Contractor shall maintain the same in motorable condition at all times as directed by Engineer-In-Charge at his own cost. The Contractor shall be required to permit the use of any roads so constructed by him for vehicles of EPI or any other agencies/ Contractors who may be engaged on the project Site, free of cost.

Non-availability of access roads or approach to Site, for the use of the Contractor shall in no case condone any delay in the execution of work nor be the cause for any claim for compensation.

2.2 HANDING OVER & CLEARING OF SITE

2.2.1 The Contractor should note that area for construction may be made available in phases as per availability and in conjunction with pace of actual progress of work at Site. The work may be required to be carried out in constrained situations. The work is to be carried out in such a way that the traffic, people movement, if any, is kept operative and nothing extra shall be payable to the Contractor due to this phasing / sequencing of the work. The Contractor is required to arrange the resources to complete the entire project within total stipulated time. Traffic diversion, if required, is to be done and maintained as per specification by the Contractor at his own cost and the Contractor shall not be entitled for any extra payment, whatsoever, in this regard.

2.2.2 Efforts will be made by EPI to handover the Site to the Contractor free of encumbrances. However, in case of any delay in handing over of the Site to the Contractor, EPI shall only consider suitable extension of time for the execution of the work. It should be clearly understood that EPI shall not consider any revision in contract price or any other compensation whatsoever viz. towards idleness of Contractor’s labour, equipment etc.

2.2.3 The Contractor shall be responsible for removal of all over-ground and underground structures (permanent, semi-permanent and temporary) and constructions from the Site. The cost to be incurred in this regard shall be deemed to be included in the quoted rates of Bill of Quantities items and Contractor shall not be entitled for any extra payment whatsoever, in this regard. Old structures on the proposed Site, if required, shall be demolished by the Contractor properly. The useful material obtained from demolition of structures &
services shall be the property of the Owner/EPI and these materials shall be stacked in workmanship like manner at the place specified by the Engineer-In-Charge.

2.2.4 If required, the Contractor has to do site clearance, enabling work, barricading, diversion of Roads, shifting/realignment of existing utility services, drains, nallahs etc. at his own cost as per direction of Engineer-In-Charge and the Contractor shall not be entitled for any extra payment whatsoever in this regard.

2.2.5 Necessary arrangements including its maintenance are to be made by the Contractor for temporary diversion of flow of existing drain and road, as the case may be. The existing drain, road would be demolished, wherever required, with the progress of work under the scope of proposed project. The existing Road and Drain, which are not in the alignment of the said project but are affected and/or need to be demolished during execution for smooth progress of the project, shall be restored to its original status and condition (including black topping) by the Contractor at his own. The cost to be incurred by Contractor in these regards shall be deemed to be included in the quoted rates of the Bill of Quantities items and Contractor shall not be entitled for any extra payment whatsoever, in these regards.

2.2.6 The Contractor shall be responsible to co-ordinate with service provider/concerned authorities for cutting of trees, shifting of utilities and removal of encroachments etc. and making the Site unhindered for completion of work. This shall include initial and frequent follow up meetings/actions/discussions with each involved service provider/concerned authorities. The Contractor shall not be entitled for any additional compensation for delay in cutting of trees, shifting of utilities and removal of encroachments by the service provider/concerned authorities.

2.2.7 The information about the public utilities (whether over ground or underground) like electrical/telephone/water supply lines, OFC Cables, sewer lines, open drains etc. is the responsibility of Contractor who has to ascertain the utilities that are to be affected by the works through the site investigation and collection of information from the concerned utility Owners.

2.2.8 The Contractor shall be responsible to obtain necessary approval from the respective authorities for shifting/re-alignment of existing public utilities. EPI shall only provide necessary letters required for liaisoning by the Contractor in obtaining the approval from the concerned authorities.

2.2.9 Any services affected by the works must be temporarily supported by the Contractor who must also take all measures reasonably required by the various bodies to protect their services and property during the progress of works. It shall be deemed to be the part of the contract and no extra payment shall be made to the Contractor for the same. Shifting/re-alignment of public utilities should be done without disturbing the existing one. New service lines should be laid and connected before dismantling the existing one.

2.2.10 Shifting/re-alignment of existing public utilities shall be done by the Contractor as per technical requirement of respective bodies or as per direction of Engineer-In-Charge. Shifting/re-alignment of public utilities includes all materials, labours,
tools and plants and any other expenses whatsoever for the same. The cost to be incurred in this regard shall be deemed to be included in his quoted rates of BOQ items and the Contractor shall not be entitled for any extra payment, whatsoever, in this regard. In case any of these services are shifted by the State Govt/ local authorities themselves for which deposit as per their estimates is to be made to them, the Contractor shall deposit the same and the Contractor shall be paid only at the rates quoted by him in BOQ for quantity specified in the BOQ, if such items are included in the BOQ irrespective of amount paid by him to the State Govt./ local authorities for execution of these works. In case such provision is not made in the BOQ or the quantity exceeds those specified in the BOQ, the same is deemed to be included in the rates quoted by him for other items in BOQ and nothing extra shall be payable to Contractor on this account.

3.0 SCOPE OF WORK

3.1 The scope of work covered in this Tender shall be as per the Bill of Quantities, Specifications, Drawings, Instructions, Orders issued to the Contractor from time to time during the pendency of work. The Drawings for this work, which may be referred for tendering, provide general idea only about the work to be performed under the scope of this contract. These may not be the final drawings and may not indicate the full range of the work under the scope of this contract. The work will be executed according to the Drawings to be released as “GOOD FOR CONSTRUCTION” from time to time by the Engineer-In-Charge of EPI and according to any additions/ modifications/ alterations/deletions made from time to time, as required by any other drawings that would be issued to the Contractor progressively during execution of work. It shall be the responsibility of the Contractor to incorporate the changes that may be in the scope of work, envisaged at the time of tendering and as actually required to be executed.

3.2 The quantities of various items as entered in the “BILL OF QUANTITIES” are indicative only and may vary depending upon the actual requirement. The Contractor shall be bound to carry out and complete the stipulated work irrespective of the variation in individual items specified in the Bill of Quantities. The variation of quantities will be governed as per clause No.69 of GCC.

4.0 VALIDITY OF TENDER

The Tender for the works shall remain open for acceptance for a period of ninety days from the date of opening of Price Bid of Tenders. The earnest money will be forfeited without any prejudice to any right or remedy, in case the Contractor withdraws his Tender during the validity period or in case he changes his offer to his benefits, which are not acceptable to EPI. The validity period may be extended on mutual consent.

5.0 ACCEPTANCE OF TENDER

EPI reserves to itself the authority to reject any or all the Tenders received without assigning any reason. The acceptance of a Tender shall be effective w.e.f. the date on which the telegram/ letter of intent or acceptance of the Tender is put in the communication by EPI. EPI also reserves the right to split the work
among two or more parties at lowest negotiated rate without assigning any reason thereof. The Contractor is bound to accept the portion of work as offered by EPI after split up at the quoted/negotiated rates.

6.0 **SET OF TENDER DOCUMENTS:**

The following documents will complete a set of Tender Documents.

A) **VOLUME I :**
   a) Instructions to tenderers
   b) General Conditions of Contract

B) **VOLUME II :**
   a) Notice Inviting Tenders
   b) Additional Conditions of Contract
   c) Technical Specifications (General, Additional & Technical specifications)
   d) Tender Drawings

C) **VOLUME III :**
   a) Schedule of Rates/ Bills of quantities (Price-Bid)

7.0 **EARNEST MONEY DEPOSIT**

Earnest Money Deposit (EMD) of amount as mentioned in “Memorandum” to “Form of Tender” required to be submitted along with the Tender shall be in the form of Demand Draft payable at place as mentioned in “Notice Inviting Tender”/“Instructions to Tenderers” in favour of ‘Engineering Projects (India) Limited’ from any Nationalised bank/Scheduled Bank or in the form of Bank Guarantee from any Nationalised bank/Scheduled Bank as per the enclosed format. The EMD shall be valid for minimum period of 150 days (One hundred fifty Days) from last day of submission of Tender.

7.1 EMD shall accompany the offer and placed in the sealed envelope cover of the offer as detailed in Instructions to Tenderer. Any tender not accompanied with the requisite Earnest Money Deposit alongwith ‘Letter of Undertaking’ shall be rejected and such tenderer(s) will not be allowed to attend the opening of bids.

7.2 The EMD of all unsuccessful tenderers (i.e. except evaluated lowest tenderer) shall be returned within Seven (7) days of the opening of price bids by EPI. Subject to clause 7.6 herein below, EMD of successful tenderer shall be refunded after submission of Security Deposit cum Performance Guarantee by him.

7.3 Once the tenderer has given an unconditional acceptance to the tender conditions in its entirety, he is not permitted to put any remark(s)/conditions(s) (except unconditional rebate on price, if any) in/along-with the Tender.

7.4 In case the condition 7.3 mentioned above is found violated at any time after opening of Tender, the Tender shall be summarily rejected and EPI shall, without
prejudice to any other right or remedy, be at liberty to forfeit the full said Earnest Money absolutely.

7.5 No interest will be payable by EPI on the said amount covered under EMD/Other security documents.

7.6 EMD of successful tenderer, if deposited in the form of Demand Draft, shall be treated as part of Retention Money.

7.7 At any time after the due date of the Tender, if any tenderer alters/modifies/withdraws his tender within the validity period (or the extended validity period) of his tender or fails to furnish the “Security Deposit cum Performance Guarantee” or the “Additional Performance Guarantee” or fails to execute the “Contract Agreement” within the prescribed time period after the placement of LOI on him, EPI without prejudice to any other rights or remedies shall be at liberty to forfeit the Earnest Money deposited by the tenderer. In the event of re-tender, such tenderer shall not be allowed to submit tender

8.0 MOBILIZATION ADVANCE

8.1 Mobilization advance up to maximum of amount as mentioned in the “Memorandum” to the “Form of Tender” shall be paid to the Contractor on submission of non-revocable and unconditional Bank Guarantee of an equivalent amount in case of interest free Mobilization Advance or for an amount equal to 110% of the Mobilization Advance in case of interest bearing Mobilization Advance, from a Nationalized Bank / Scheduled Bank as per the enclosed Performa subject to conditions given hereunder. The Mobilization Advance shall be at the Interest Rate as mentioned in the “Memorandum” to the “Form of Tender”. This advance shall be paid in three installments as follows: -

i) First Installment of fifty percent of total mobilization advance shall be paid after fulfillment of the following conditions:

   a) Signing of the agreement.
   b) Submission of Security Deposit cum Performance Guarantee as per Clause No. 9.

ii) Second installment of twenty five percent of total mobilization advance will be paid after the setting up of site office and providing facilities to EPI as per contract, and completion of enabling works required for taking up the construction. These include construction of store, labour hutments, etc.

iii) The balance twenty five percent of total mobilization advance shall be paid on mobilization of manpower, plant & equipment etc. to the satisfaction of Engineer-In-Charge of EPI.

8.2 The Advance shall be recovered on monthly installment basis. The installments shall commence when 20% of the scheduled contract period has elapsed and fully recovered when 80% of the scheduled contract period is over, both from
date of start. (The month of start & completion of recovery of mobilization advance to be rounded off to nearest full month).

8.3 Part ‘Bank Guarantees’ (BGs) against mobilization advance shall be furnished in as many numbers as the number of recovery installments as given in “Memorandum” to the “Form of Tender” and should be equivalent to the amount of each recovery installment. At any point of time, if the Contractor's payable amount on account of work done is not available with EPI or the amount payable is less than the recovery installment, recovery of such advance shall be effected by encashing the BG of equivalent recovery amount. The decision of EPI in this regard shall be final and binding on the Contractor. The validity period for the part BGs shall be till three months after the end of the month in which instalment is due to be recovered with further three months claim period.

8.4 In case recovery of Mobilization Advance is delayed, interest shall be charged @12% (Twelve percent) per annum on delayed recoveries due to late submission of bills by the Contractor or due to delayed encashment of Bank Guarantee, as stated above or due to any other reasons whatsoever.

8.5 Contractor is required to furnish the Utilization Certificate for each installment of mobilization advance to the satisfaction of Engineer-In-Charge. Subsequent installments of mobilization advance shall be released only after getting satisfactory utilisation certificate from the Contractor for the earlier released installment.

8.6 Notwithstanding what is contained in aforesaid clauses, no mobilization advance whatsoever shall be payable, if payment of mobilization advance is not mentioned in the “Memorandum” to the “Form of Tender”.

9.0 SECURITY DEPOSIT CUM PERFORMANCE GUARANTEE

“Within 10 (ten) days from the date of issue of letter of Intent or within such extended time as may be granted by EPI in writing, the Contractor shall submit to EPI a Security Deposit cum Performance Bank Guarantee in the form appended, from any Nationalised bank / Scheduled Bank equivalent to 5% (five percent only) of the Contract Value for the due and proper execution of the contract. This bank guarantee shall remain valid up to 90 (ninety) days after the end of defects liability period.

In case the Contractor fails to submit the Security Deposit cum Performance Guarantee of the requisite amount within the stipulated period or extended period, letter of intent will stand withdrawn and EMD of Contractor shall be forfeited.

9.1 ADDITIONAL PERFORMANCE GUARANTEE FOR EXISTING CONTRACTORS

In case bidder is a working Contractor of EPI at the time of issuance of Letter of Intent (LOI) for the work, the bidder has to furnish an additional Performance Guarantee of 1% (One Percent) of the Contract Value of the work, in case working capacity of the bidder is less than the aggregate of balance work-load of all the works of the bidder with EPI as on date of placement of LOI for this work. The balance workload shall also include the value of work awarded but not yet
started and finally approved value of this work. This additional Performance Guarantee shall be in addition to the Security Deposit cum Performance Guarantee of the works to be furnished by the bidder as specified in the clause no. 9 of General Conditions of Contract. Further, no relaxation in Security Deposit cum Performance Guarantee as in clause no. 9 of General Conditions of Contract shall be made in case working capacity works-out to be more than the balance value of works as mentioned above. The working capacity of the Contractor shall be calculated as under:

\[
\text{WORKING CAPACITY} = 2.5 \times \text{(Average Turnover of the party as per latest three audited Balance Sheets)}.
\]

NOTE: The decision of amount of additional Performance Guarantee as above shall be taken by EPI and shall be final & binding to the Contractor.

In case the Contractor fails to submit the additional performance guarantee of the requisite amount within 10 days from the date of issue of letter of Intent or within such extended time as may be granted by EPI in writing, the letter of intent will stand withdrawn and EMD of the Contractor shall be forfeited.

9.2 ABNORMALLY HIGH AND LOW RATED ITEMS

For item rate tenders if, the rates quoted by the lowest bidder for certain items of the Bill of Quantities of the Tender are found to be abnormally high or low in comparison to the Market Rate analysis of the item done by EPI and/or in comparison to EPI's method of working out market rate justification for the items, the same shall be governed as under:

For Abnormally High Rated items (AHR), the progressive payment shall be 80% (Eighty percent) of the payment due to the Contractor against execution of the AHR items. The balance withheld 20% (twenty percent) payment shall be released after 80% of total value of the original contract is completed in financial terms in order to ensure that the Abnormally Low Rated (ALR) items identified at the time of Award of work have been executed as per requirement of project and as per terms of Contract. Further, deviation limit for AHR items shall be nil on plus side and 100% on minus side. The provision of deviation limit of clause 69.1(v) shall not apply to AHR items. In case of deviation of quantities given in schedule of quantities for AHR items on plus side, the same shall be governed by clause 69.2. The decision of Engineer-In-Charge of EPI in this regard shall be final and binding on the Contractor.

The provision of para 9.2 shall not be applicable on tenders invited on Percentage Rate/lump Sum basis.
The decision of EPI on identification/marking of AHR and ALR items is final and binding on the Contractor. In case the Contractor does not agree to the identified AHR and ALR items, at the time of award of works, the EMD/Security Deposit cum Performance Guarantee of the Contractor shall be forfeited and decision of EPI in this regard shall be final & binding on the Contractor.

10.0 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 to the Contractor after expiry of defects liability period (referred to in Clause No. 74) or on payment of the amount of the final bill whichever is later. If the amount of Retention Money deduction in cash is more than Rs.10.00 lakhs (Rupees Ten lakhs only), the excess amount can be refunded to Contractor against submission of Bank Guarantee of equivalent amount from a Nationalised bank / Scheduled Bank in the prescribed proforma of Performance Guarantee of EPI.

11.0 MOBILIZATION OF MEN, MATERIALS AND MACHINERY:

11.1 All expenses towards mobilization at Site and de-mobilization including bringing in equipment, work force, materials, dismantling the equipments, clearing the Site etc. shall be deemed to be included in prices quoted and no separate payment on account of such expenses shall be entertained.

11.2 It shall be entirely the Contractor’s responsibility to provide, operate and maintain all necessary construction equipments, scaffoldings and safety gadget, lifting tackles, tools and appliances to perform the work in a workman like and efficient manner and complete all jobs as per the specifications and within the schedule time of completion of work. Further, Contractor shall also be responsible for obtaining temporary electric and water connection for all purposes. The Contractor shall also make standby arrangement for water & electricity to ensure un-interrupted supply.

11.3 It shall be the responsibility of the Contractor to obtain the approval for any revision and/ or modification desired by him from EPI before implementation. Also such revisions and/or modifications if accepted / approved by EPI shall be carried at no extra cost to EPI.

11.4 The procurement and supply in sequence and at the appropriate time of all materials and consumable shall be entirely the Contractor’s responsibility and his rates for execution of work shall be inclusive of supply of all these items.
11.5 It is mandatory for the Contractor to provide safety equipments and gadgets to its all workers, supervisory and Technical staff engaged in the execution of the work while working. The minimum requirement (but not limited to) shall be gumboots, safety helmets, Rubber hand gloves, facemasks, safety nets, belts, goggles etc. as per work requirements. Sufficient nos. of these equipments and gadgets shall also be provided to EPI by the Contractor at his own cost for use of EPI Officials and/ or workforce while working/ supervision at Site. No staff/ worker shall be allowed to enter the Site without these equipments/ gadgets. The cost of the above equipments/ gadgets are deemed to be included in the rates quoted by the Contractor for the items & works as per Bill of Quantities and Contractor shall not be entitled for any extra cost in these regard. The above norm is to be strictly complied with at Site. In case the Contractor is found to be deficient in providing Safety Equipments/ Gadgets in the opinion of Engineer-In-Charge, the Engineer-In-Charge at his option can procure the same at the risk & cost of Contractor and provide the same for the use of worksite and shall make the recoveries from the bills of the Contractor for the same. The decision of the Engineer-In-Charge shall be final and binding on Contractor in this regard.

11.6 All Designs, Drawings, Bill of Quantities, etc. (except Bar Bending Schedule, Shop & Fabrication Drawings) for all works shall be supplied to the Contractor for all buildings services and development works by EPI in phased manner as the works progress. However it shall be the duty and responsibility of the Contractor to bring to the notice of EPI in writing as to any variation, discrepancy or any other changes required and to obtain revised drawings and designs and / or approval of EPI in writing for the same.

11.7 One copy of contract documents including Drawings furnished to the Contractor shall be kept at the Site and the same shall at all reasonable times be available for inspection.

11.8 All materials, construction plants and equipments etc. once brought by the Contractor within the project area, will not be allowed to be removed from the premises without the written permission of EPI. Similarly all enabling works built by the Contractor for the main construction undertaken by him, shall not be dismantled and removed without the written authority of EPI.

11.9 Contractor shall have to prepare the Bar Bending Schedule, Shop and Fabrication Drawings free of cost, if required for any of the items of work. Five copies of these Drawings each including for revision will be submitted to EPI for approval. Before executing the item, Bar Bending Schedule, Shop & Fabrication Drawings should be got approved from EPI.

12.0 INCOME TAX DEDUCTION

Income tax deductions shall be made from all payments made to the Contractor including advances against work done, in accordance with the Income Tax act prevailing from time to time.
13.0 TAXES AND DUTIES

13.1 The Contractor shall be responsible for the payment, wherever payable, at his own cost of all taxes such as excise duty, custom duty, sales tax, including the purchase tax, consignment tax, work contract tax, service tax, VAT or any other similar tax in the state concerned, turnover tax, toll tax, octroi charges, royalty, cess, levy and other tax (es) or duty (ies) which may be specified by local/ state/ central government from time to time on all materials, articles which may be used for this work. The rates quoted by him in the Tender in Bill of Quantities shall be inclusive of all such taxes, duties, etc. The imposition of any new and/ or increase in the aforesaid taxes, duties, levies (including fresh imposition of Work Contract Tax, Turnover Tax, Sales Tax on Work Contract, VAT or any other similar Tax) etc. during the currency of the contract shall be borne by Contractor and shall not be paid or reimbursed to the Contractor by EPI. In the event of non-payment/default in payment of any octroi, royalty, cess, turnover tax, sales tax, including the purchase tax, consignment tax, work contract tax, VAT, Service Tax or any other similar tax in the state concerned, customs, excise or any other levy/tax including labour dues etc. by Contractor, EPI reserves the right to withhold the dues/ payments of Contractor and make payment to local/state/ Central Government authorities or to labourers as may be applicable. The Contractor should submit along with the Tender Registration Certificates with Sales Tax on works contract authority etc. other wise appropriate recovery shall be made from his bills.

13.2 The rate quoted by the Contractor shall be deemed to be inclusive of all Taxes and duties as mentioned in clause no.13.1 given above or any other tax as applicable and the same shall not be reimbursed by EPI. Tax deductions at source shall be made as per laws prevalent in the State.

13.3 The stamp duty and registration charges, if any, on the contract agreement levied by the Government or any other statutory body, shall be paid by the Contractor.

13.4 It will be incumbent upon the Contractor to obtain a registration certificate as a dealer under the Local Sales Tax Act and the Central Sales Tax Act, Service Tax, etc. and necessary evidence to this effect shall be furnished by the Contractor to EPI. Sales Tax on the transactions between the Contractor and his Sub-Contractor/Vendors etc. shall be borne by the Contractor. The Contractor shall be responsible for any taxes that may be levied hereunder on the transaction between Contractor and EPI.

13.5 The bidder shall quote his rates inclusive of Turnover Tax/ Sales Tax on Works Contract payable to State Govt. along-with other taxes, duties, levies etc. in conjunction with other terms and conditions. In case, the Turnover Tax/ Sales Tax on Works Contract on execution of works is waived off by the State Govt. at later stage for this project, the equivalent amount from the date of waiver of such tax (as per prevailing rate as on the date of waiver of Turnover Tax/ Sales Tax on Works Contract) shall be deducted from the amount payable to the Contractor from subsequent RA Bills.
13.6 **VALUE ADDED TAX (VAT)**

The consideration agreed for the execution of said contract shall include the taxes, duties, cess, etc. such as excise duty, service tax, VAT, which is leviable or may be levied in future under any State Law or the Central Law on execution of said contract, such taxes shall be borne by the Contractor and shall not be reimbursed by EPI. Further, if due to any variance in such tax, duties, cess etc. there is any increase in the taxes, the same shall also be borne by the Contractor. Where under any of the State or the Central Law, there is requirement of deduction of tax at source, the same shall be deducted from the amount paid or payable to the Contractor pursuant to this contract and shall be deposited to the Government authorities by EPI. EPI shall issue the documents/forms/certificate as prescribed under the relevant law, in respect of the amount so deducted from the amount paid or payable to the Contractor. EPI shall have full rights to withhold the amount payable to the Contractor in pursuit to this contract, if Contractor does not fulfill his obligation under any State or Central Law relating to execution of said contract, in case the amount has already been paid by EPI, EPI has the right to recover such payments from the Contractor.

14.0 **ROYALTY ON MATERIALS:**

The Contractor shall deposit royalty and obtain necessary permit for supply of bajri, stone, kankar, sand, etc. from the local authorities and quoted rates shall be inclusive of royalty.

15.0 **RATES TO BE FIRM**

15.1 The rates quoted by the tenderer shall be firm and fixed for the entire period of completion and till handing over of the work. No revision to rates or any escalation shall be allowed on account of any increase in prices of materials, labour, POL and Overheads etc or any other statutory increase during the entire contract period or extended contract period.

15.2 The Contractor shall be deemed to have inspected the Site, its surrounding and acquainted itself with the nature of the ground, accessibility of the Site and full extent and nature of all operations necessary for the full and proper execution of the contract, space for storage of materials, construction plant, temporary works, restrictions of working time, restrictions on the plying of heavy vehicles in area, supply and use of labour, materials, plant, equipment and laws, rules and regulations, if any, imposed by the local authorities.

15.3 The rates and prices to be tendered in the Bill of Quantities are for completed and finished items of works complete in all respects. It will be deemed to include all construction plant, labour, supervision, materials, transport, all temporary works, erection, maintenance, Contractor’s profit and establishment/overheads, together with preparation of designs & drawings pertaining to casting yard, shop drawing, fabrication drawing (if required), staging form work, stacking yard, etc. all general risk, taxes, royalty, duties, cess, octroi and other levies, insurance,
liabilities and obligations set out or implied in the Tender Documents and contract.

15.4 Unless otherwise specified in the Bill of Quantities (BOQ), the Contractor has to make his own arrangement for dewatering/ bailing out of water, effluent including strutting, shoring etc at every stage of work wherever required (including Tunnel work) including working under foul condition as per direction of Engineer-In-Charge at his own cost and the Contractor shall not be entitled for any extra payment, whatsoever, in this regard.

15.5 If required to make work site suitable for execution, Contractor shall have to clear jungle including of rank vegetation, grass, trees etc., clear & clean existing drains/ canals (including strutting, shoring and packing cavities) and dispose them out of the Site up to any lead and lift as per direction of Engineer-In-Charge. The Contractor should inspect the Site of work from this point of view. Unless otherwise specified in the Bill of Quantities, the cost to be incurred in this regard shall be deemed to be included in his quoted rates of BOQ items and the Contractor shall not be entitled for any extra payment in this regard.

15.6 If any temporary/ permanent structure is encountered or safety of such structure in the vicinity is endangered due to execution of the project, the Contractor has to protect the structures by any means as per direction of Engineer - in – Charge. If any damage caused to any temporary or permanent structure(s) in the vicinity is caused due to execution of the project, the Contractor has to make good the same by any means as per direction of Engineer - in – Charge. The Contractor should inspect the Site of work from this point of view. The cost to be incurred in this regard shall be deemed to be included in his quoted rates of BOQ items and the Contractor shall not be entitled for any extra payment in this regard.

16.0 ESCALATION / PRICE VARIATION

No claim on account of any Price Variation / Escalation on whatsoever ground shall be entertained at any stage of works. All rates as per Bill of Quantities (BOQ)/Price-Bid quoted by Contractor shall be firm and fixed for entire contract period as well as extended period for completion of the works. No escalation/price variation clause shall be applicable on this contract.

17.0 INSURANCE OF WORKS ETC.

Contractor is required to take Contractor’s All Risk Policy or Erection All Risk Policy (as the case may be) including Marine Insurance from an Approved Insurance Company in the joint name with EPI and bear all costs towards the same for the full period of execution of works including the defect liability period for the full amount of contract against all loss or damage from whatever cause arising for which he is responsible under the terms of the contract and in such manner that EPI and the Contractor are covered during the period of construction of works and/or also covered during the period of defect liability for the loss or damage as under:

a. The work and the temporary works to the full value of such works.
b. The materials, construction plant, centering, shuttering and scaffolding materials and other things brought to the Site for their full value. Whenever required by EPI, the Contractor shall produce the policy or the policies of insurance and the receipts for payment of the current premiums.

18.0 INSURANCE UNDER WORKMEN’S COMPENSATION ACT

Contractor is required to take insurance cover as per requirement of the Workmen’s Compensation Act, 1923 amended from time to time from an Approved Insurance Company and pay premium charges thereof. Wherever required by EPI the Contractor shall produce the policy or the policies of Insurance and the receipt of payment of the current premiums.

19.0 THIRD PARTY INSURANCE

Contractor is required to take third party insurance cover for an amount of 5% (five percent) of Contract Value from an Approved Insurance Company for insurance against any damage, injury or loss which may occur to any person or property including that of EPI, arising out of the execution of the works or temporary works. Wherever required by EPI the Contractor shall produce the policy or the policies of Insurance and the receipt of payment of the current premiums.

In case of failure of the Contractor to obtain insurance for works, insurance under Workman Compensation Act and Third Party insurance as described above within one month from the date of commencement of work, running account payments of the Contractor shall be withheld till such time the aforesaid insurance covers are obtained by the Contractor.

20.0 INDEMNITY AGAINST PATENT RIGHTS

The Contractor shall fully indemnify EPI from and against all claims and proceedings for or on account of any infringement of any patent rights, design, trademark or name or other protected rights in respect of any construction plant, machine, work or material used for in connection with the works or temporary works.

21.0 LABOUR LAWS TO BE COMPLIED WITH BY THE CONTRACTOR

The Contractor shall obtain a valid licence under the contract labour (Regulation & Abolition) Act 1970 and the Contract Labour Act (R&A) Central Rules 1971 and amended from time to time, and continue to have a valid licence until the completion of the work including defect liability period. The Contractor shall also abide by the provision of the child labour (Prohibition and Regulation) Act. 1986 and as amended from time to time. Any failure to fulfill this requirement shall attract the penal provisions of this contract arising out of the resultant non-execution of the work.
The Contractor shall comply with the provisions of the payment of Wages Act, 1936, Minimum Wages Act, 1948, Employer's Liability Act, 1938, Workmen's Compensation Act, 1923, Maternity Benefit Act, 1961 and Mines Act - 1932, Industrial Disputes Act, 1947 or any modifications thereof or any other law relating thereto and rules made there under from, time to time.

21.1 No labour below the age of 18 years shall be employed on the work.

22.0 LABOUR SAFETY PROVISION

The Contractor shall be fully responsible to observe the labour safety provisions.

23.0 OBSERVANCE OF LABOUR LAWS

23.1 The Contractor shall be fully responsible for observance of all labour laws applicable including local laws and other laws applicable in this matter and shall Indemnify and keep indemnified EPI against effect of non observance of any such laws. The Contractor shall be liable to make payment to all its employees, workers and sub-Contractors and make compliance with labour laws. If EPI or the Client/Owner/ Employer is held liable as "Principal Employer" to pay any amount or contributions etc. under legislation of Govt. or Court decision in respect of the employees of the Contractor, then the Contractor would reimburse the amount of such payments, contribution etc. to EPI and/or same shall be deducted from the payments, Retention Money etc. of the Contractor.

23.2 The Contractor shall submit proof of having valid EPF registration certificate. In absence of the said certificate payment to the extent of 4.70% (four point seven percent) of the value of all the Running Account bills may be withheld by EPI and shall be released only after the production of the EPF registration certificate from the concerned authorities. If it is incumbent upon EPI to deposit withheld amount with EPF authorities, the withheld amount shall be deposited by EPI with EPF authorities. In such a case EPI shall not refund this withheld amount to the Contractor even after the production of EPF registration certificate.

23.3 The Contractor shall be liable to pay cess levied under the Building and other Construction Workers Welfare Cess Act, 1996, at such rates as may be notified by the Government from time to time. EPI shall deduct at source from every Running Account Bill of the Contractor, the said cess, at such rates for the time being prevailing, which shall not exceed 2% (two percent) but not be less than 1% (one percent) of the cost of construction incurred by EPI.

24.0 LAWS GOVERNING THE CONTRACT

This contract shall be governed by the Indian Laws for the time being in force and amended from time to time.

25.0 LAWS, BYE LAWS RELATING TO THE WORK

The Contractor shall strictly abide by the provisions, for the time being in force, of law relating to works or any regulations and bye laws made by any local authority or any water & lighting agencies or any undertakings within the limits of the
jurisdiction of which the work is proposed to be executed. The Contractor shall be bound to give to the authorities concerned such notices and take all approvals as may be provided in the law, regulations or bye laws as aforesaid, and to pay all fees and taxes payable to such authorities in respect thereof.

26.0 EMPLOYMENT OF PERSONNEL

26.1 The Contractor shall employ only Indian Nationals as his representatives, servants and workmen after verifying their antecedents and loyalty. He shall ensure that no personnel of doubtful antecedents & integrity and any other nationality in any way are associated with the works.

26.2 EPI shall have full power to get removed immediately any representative, agent, servant and workmen or employees of the Contractor on account of misconduct, negligence or incompetence or whose continued employment may in the opinion of the Engineer-In-Charge be undesirable without assigning any reason for the removal. The Contractor shall not be allowed any compensation on this account whatsoever.

27.0 TECHNICAL STAFF FOR WORK

27.1 The Contractor shall employ at his cost the adequate number of technical staff during the execution of this work depending upon the requirement of work. For this purpose the numbers to be deployed, their qualification, experience as decided by EPI shall be final and binding on Contractor. The Contractor shall not be entitled for any extra payment in this regard. The technical staff should be available at Site, whenever required by EPI to take instructions.

27.2 Within 15 days from the date of letter of intent, the Contractor shall submit a site organizational chart and Resume including details of experience of the Project-in-Charge and other staff proposed by him and shall depute them on the Project after getting approval from Engineer-In-Charge. If desired by the Contractor at later date, the Project-in-Charge and other staff whose resume is approved by EPI can be replaced with prior written approval of EPI and replacement shall be with equivalent or superior candidate only. Decision of Engineer-In-Charge shall be final and binding on the Contractor.

Even after approving the site organizational chart, the Engineer-In-Charge due to nature and exigency of work can direct the Contractor to depute such additional staff as in view of Engineer-In-Charge is necessary and having qualification and experience as approved by the Engineer-In-Charge. The removal of such additional staff from the Site shall only be with the prior written approval of Engineer-In-Charge. The Contractor shall not be paid anything extra whatsoever on account of deployment of additional staff and decision of the Engineer-In-Charge shall be final and binding on the Contractor.

27.3 In case the Contractor fails to employ the staff as aforesaid, he shall be liable to pay a reasonable amount not exceeding a sum of Rs. 25,000 (Rupees Twenty Five Thousand only) for each month of default in the case of each person. The
decision of the Engineer-In-Charge as to number of Technical Staff to be adequate for the project and the period for which the required technical staff was not employed by the Contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the Contractor.

28.0 LAND FOR LABOUR HUTS/ SITE OFFICE AND STORAGE ACCOMMODATION

28.1 The Contractor shall arrange the land for temporary office, storage accommodation and labour huts at his own cost and get the clearance of local authorities for setting up of labour camp and cost of same is deemed to be included in the rates quoted by the Contractor for the works. The Contractor shall ensure that the area of labour huts is kept clean and sanitary conditions are maintained as laid down by the local authorities controlling the area. The labour huts shall be so placed that it does not hinder the progress of work or access to the worksite. The vacant possession of the land used, for the purpose shall be given back by Contractor after completion of the work. The Retention Money of the Contractor shall be released only after Contractor demolishes all structures including foundations and gives back clear vacant possession of this land.

28.2 In the event the Contractor has to shift his labour camp at any time during execution of the work on the Instructions of local authorities or as per the requirement of the work progress or as may be required by EPI, he shall comply with such instructions at his cost and no claim whatsoever shall be entertained on this account.

28.3 FURNISHED OFFICE ACCOMMODATION & MOBILITY AND COMMUNICATION TO BE PROVIDED BY CONTRACTOR TO EPI

On acceptance of Tender, the Contractor at his own cost will construct a suitable furnished office at Site equipped with basic facilities such as telephone(s), fax, internet, photocopier, computer(s) & printer(s) alongwith operator(s), regular electricity & drinking water supply and vehicles for staff etc. as per the requirement of the project. The Contractor shall provide consumable as required and maintain the aforesaid facilities intact/operational during the currency of the contract including the defects liability period. The Contractor shall also make sufficient arrangement for photography/ videography preferably by maintaining a camera/video camera at Site so that photographs video can be taken of any specific activity at any point of time. The Contractor shall also provide software like MS Project etc. for the purpose of preparing progress report, etc.

28.4 The Contractor shall make all arrangements for ground breaking ceremony/ inaugural function etc for the project as required and the cost towards it is deemed to be included in his rates/offer. Any expenditure already incurred/to be incurred by EPI, shall be recovered from the Contractor.

28.5 PROTECTION OF TREES

Trees designated by the Engineer-In-Charge shall be protected from damage during the course of the works and earth level within one meter of each such tree shall not
be changed. Where necessary, such trees shall be protected by providing temporary fencing.

29.0 **WATCH & WARD AND LIGHTING**

The Contractor shall at his own cost take all precautions to ensure safety of life and property by providing necessary barriers, lights, watchmen etc. during the progress of work as directed by Engineer-In-Charge.

30.0 **HEALTH & SANITARY ARRANGEMENTS**

In case of all labour directly or indirectly employed in work for the performance on the Contractor’s part of this contract, the Contractor shall comply with all rules and regulations framed by Govt. from time to time for the protection of health and sanitary arrangements for workers.

31.0 **WORKMEN’S COMPENSATION ACT**

The Contractor shall at all times indemnify EPI and Owner against all claims for compensation under the provision of Workmen’s Compensation Act, 1923 or any other law in force, for any workmen employed by the Contractor or his sub-Contractor in carrying out the contract and against all costs and expenses incurred by EPI therewith.

32.0 **MINIMUM WAGES ACT**

The Contractor shall comply with all the provisions of the Minimum Wages Act, 1948, Contract Labour Act (R&A) 1970, and rules framed thereunder and other labour laws/local laws affecting contract labour that may be brought into force from time to time.

33.0 **LABOUR RECORDS**

The Contractor shall submit by the 4th & 19th of every month to the Engineer-In-Charge of EPI a true statement, showing in respect of the second half of the preceding month and the first half of the current month, respectively, of the following data :-

a) The number of the labour employed by him (category-wise).

b) Their working hours.

c) The wages paid to them.

d) The accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused.
e) The number of female workers who have been allowed Maternity Benefits under the Maternity Benefit Act, 1962 and the amount paid to them.

f) Any other information required by Engineer-In-Charge.

34.0 RELEASE OF RETENTION MONEY AFTER LABOUR CLEARANCE

Retention Money of the work shall not be refunded till the Contractor produces a clearance certificate from the concerned Labour Officer. As soon as the work is virtually complete, the Contractor shall apply for the clearance certificate to the concerned Labour Officer under intimation to the Engineer-In-Charge. The Engineer-In-Charge, on receipt of the said communication, shall write to the Labour Officer to intimate if any complaint is pending against the Contractor in respect of the work. If no complaint is pending, on record till three months after completion of the work and/or no communication is received from the Labour Officer to effect till six months after the date of completion, it will be deemed to have received the clearance certificate and the Retention Money will be released if otherwise due.

35.0 SECURED ADVANCE AGAINST NON-PERISHABLE MATERIALS

Interest free secured advance up to a maximum of 75% (seventy five percent) of the Market Value of the materials or the cost of materials as derived from the tendered item rate of the Contractor, whichever is less, required for incorporation in the permanent works and brought to Site and duly certified by EPI Site Engineer shall be paid to the Contractor for all non-perishable items as per CPWD/MORTH (as the case may be) norms. The advance will be paid only on submission of Indemnity Bond in the prescribed pro-forma. The advance shall be recovered in full from next Running Account bill and fresh advance paid for the balance quantities of materials. The Contractor shall construct suitable godown at the Site of work for safe storage of the materials against any possible damages due to sun, rain, dampness, fire, theft etc. at his own cost. He shall also employ necessary watch & ward establishment for the purpose at his costs and risks. Such secured advance shall be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-In-Charge provided the Contractor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Engineer-In-Charge shall be final and binding on the Contractor in this matter. No secured advance shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel etc.

36.0 MEASUREMENTS OF WORKS

36.1 Unless otherwise mentioned in the Bill of Quantities the measurements of works shall be done as per CPWD/MORTH specifications (as specified in Technical Specification of the Tender) and if the same is not given in the CPWD/MORTH Specifications, the same shall be measured as per latest relevant BIS codes in force. The quantity of steel reinforcement and the structural steel sections incorporated in the work shall be measured & paid on the basis of standard coefficients of sections as per BIS Codes of practice.
36.2 The Engineer-In-Charge shall except as otherwise stated ascertain and determine by measurement the value of work done in accordance with the contract.

36.3 All items having financial value shall be entered in Measurement Book, level book, etc. prescribed by EPI so that a complete record is obtained of all work performed under the contract. Items of non-financial value (which are not payable) may also be entered in Measurement Book at the sole discretion of the Engineer-In-Charge.

36.4 Measurements shall be taken jointly by the Engineer-In-Charge or his authorized representative and by the Contractor or his authorized representative.

36.5 Before taking measurements of any work the Engineer-In-Charge or the authorized person deputed by him for the purpose shall give a reasonable notice to the Contractor. If the Contractor fails to attend or send an authorized representative for measurement after such a notice or fails to countersign or to record the objection within a week from the date of measurement, then in any such event measurement taken by the Engineer-In-Charge or by the person deputed by him shall be taken to be correct measurements of the work.

36.6 The Contractor shall, without extra charge provide assistance with every appliance, labour and other things necessary for measurement.

Measurements shall be signed and dated by both parties each day on the Site on completion of measurement.

37.0 PAYMENTS

37.1 The bill shall be submitted by Contractor each month on or before the date fixed by the ENGINEER-IN-CHARGE for all works executed in previous months. The Contractor shall prepare computerized bills using the program as approved by Engineer-In-Charge as per prescribed format/ pro-forma. The Contractor shall submit five numbers of hard copies and one soft copy of floppy/ CD for all bills. Subject to clause 37.3 herein below, the payment due to the Contractor shall be made within fifteen days of getting the measurements verified from the Engineer-In-Charge or his subordinate/ representative and certification of bill by the Engineer-In-Charge.

37.2 All running payments shall be regarded as ‘on account’ payments against the final payment only and not as payments for work actually done and completed and / or accepted by EPI and shall not preclude the recovery for bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the Contract, or any part thereof, in this respect, or the accruing of any claim, nor shall it conclude, determine or affect in any way the powers of EPI under these conditions or any of them as to the final settlement and adjustments of the accounts or otherwise, or in any other way vary/ affect the contract. The final bill shall be submitted by the Contractor within three months of
the completion of work, otherwise EPI’s certificate of the measurement and of the total amount payable for the work accordingly shall be final and binding on Contractor. Each Running Bill should be accompanied by two sets of at-least 20 (twenty) photographs as per direction of Engineer-In-Charge taken from various points depicting status of work as on Report/ Bill date along with Monthly Progress Report for the concerned month in the pro-forma to be given/ approved by Engineer-In-Charge. Intermittent progress photographs as and when required shall also be provided by the Contractor at his own cost as per direction of Engineer-In-Charge. No payment of running account bill shall be released unless it is accompanied by progress photographs and Monthly Progress Report as above.

37.3 It is clearly agreed and understood by the Contractor that notwithstanding anything to the contrary that may be stated in the agreement between EPI and the Contractor, the Contractor shall become entitled to payment only after EPI has received the corresponding payment(s) from the Client/ Owner for the work done by the Contractor. Any delay in the release of payment by the Client/ Owner to EPI leading to delay in the release of the corresponding payment by EPI to the Contractor shall not entitle the Contractor to any compensation/ interest from EPI.

37.4 All payments shall be released by EPI by Account Payee Cheque from any of its offices in India directly at the address notified by the Contractor (Postage charges shall be charged to the Contractor’s account). In case of Payments is made by Demand Draft at the request of the Contractor, Bank Commission charges shall be debited to the account of Contractor.

38.0 WORK ON SUNDAYS, HOLIDAYS AND DURING NIGHT

For carrying out work on Sunday and Holidays or during night, the Contractor will approach the Engineer-In-Charge or his representative at least two days in advance and obtain his permission. The Engineer-In-Charge at his discretion can refuse such permission. The Contractor shall have no claim on this account whatsoever. If work demand, the Contractor shall make arrangements to carry out the work on Sundays, Holidays and in two, three shifts with the approval of Engineer-in-Charge at no extra cost to EPI.

39.0 NO IDLE CHARGES TOWARDS LABOUR OR PLANT & MACHINERY ETC.

No idle charges or compensation shall be paid for idling of the Contractor's labour, staff or Plant & Machinery etc. on any ground or due to any reason whatsoever. EPI will not entertain any claim in this respect.

40.0 WORK TO BE EXECUTED IN ACCORDANCE WITH SPECIFICATIONS, DRAWINGS, ORDERS, ETC.

The Contractor shall execute the whole and every part of the work in the most substantial and workman like manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The Contractor shall also conform exactly, fully and faithfully to the Design, Drawings and Instructions
in writing in respect of the work assigned by the Engineer-In-Charge and the Contractor shall be furnished free of charge one copy of the Contract Documents together with Specifications, Designs, Drawings.

The Contractor shall comply with the provisions of the contract and execute the works with care and diligence and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

41.0  DIRECTION FOR WORKS

41.1  All works to be executed under the contract shall be executed under the direction and subject to approval in all respect of the Engineer-In-Charge of EPI who shall be entitled to direct at what point or points and in what manner works are to be commenced and executed.

41.2 The Engineer-In-Charge and his representative shall communicate or confirm their instructions to the Contractor in respect of the execution of work during their Site inspection in a ‘Works Site Order Book’ maintained at the site office of Engineer-In-Charge. The Contractor or his authorized representative shall confirm receipt of such instructions by signing against the relevant orders in the book. The Contractor shall be bound to sign the site order book as and when required by Engineer-In-Charge and carry out compliance of instructions promptly to the satisfaction of Engineer-In-Charge.

42.0  ORDER OF PRECEDENCE OF DOCUMENTS

42.1 In case of difference, contradiction, discrepancy, dispute with regard to Conditions of Contract, Specifications, Drawings, Bill of Quantities and Rates quoted by the Contractor and other documents forming part of the contract, the following shall prevail in order of precedence.

i) Contract Agreement
ii) Fax, Telegram or Letter of Intent, detailed letter of Work Order along with statement of agreed variations and its enclosures.
iii) Description in Bill of Quantity / Schedule of Quantities
iv) Additional Conditions of Contract.
v) Technical specifications (General / Special Technical Specification) as given in the Tender Documents.
vi) General Conditions of Contract.
vii) Drawings
viii) CPWD/ MORTH specifications (as specified in Technical Specification of the Tender) update with correction slips issued up to last date of receipt of Tenders.
ix) Relevant B.I.S. Codes.

42.2 If there are varying or conflicting provisions made in any one document forming part of the contract, the Engineer-In-Charge shall be the deciding authority with regard to the intention of the document which shall be final and binding on the Contractor.

42.3 Any error in description, quantity or rate in the Schedule of Quantities/items or Bill of Quantities or any omission there from shall not vitiate the contract or release the Contractor from the execution of the whole or any part of the works comprised therein according to the Drawings and Specifications or from any of his obligations under the contract.

43.0 TIME SCHEDULE & PROGRESS

43.1 Time allowed for carrying out all the works as entered in the Tender shall be as mentioned in the “Memorandum” to the “Form of Tender” which shall be reckoned from the 10th day from the date on which the letter/telegram of Intent is issued to the Contractor. Time shall be the essence of the contract and Contractor shall ensure the completion of the entire work within the stipulated time of completion.

43.2 The Contractor shall also furnish within 10 days from the date of letter/telegram of Intent, a CPM network/PERT chart/Bar Chart for completion of work within stipulated time. This will be duly got approved from EPI. This approved Network/PERT Chart shall form a part of the agreement. Achievement of milestones as well as total completion has to be within the time period allowed.

43.3 Contractor shall mobilize and employ sufficient resources for completion of all the works as indicated in the agreed BAR CHART/Network. No additional payment will be made to the Contractor for any multiple shift work or other incentive methods contemplated by him in his work schedule even though the time schedule is approved by the Engineer-In-Charge.

43.4 During the currency of the work the Contractor is expected to adhere to the time schedule on milestone and total completion and this adherence will be a part of Contractor’s performance under the contract. During the execution of the work Contractor is expected to participate in the review and updating of the Network/BAR CHART undertaken by EPI. These reviews may be undertaken at the discretion of EPI either as a periodical appraisal measure or when the quantum of work order on the Contractor is substantially changed through deviation orders or amendments. The review shall be held at Site or any of the offices of EPI/Owner or Consultant of EPI/Owner at the sole discretion of EPI.

43.5 If at any time, it appears to the Engineer-In-Charge that the actual progress of work does not conform to the approved programme referred above, the Contractor shall produce a revised programme showing the modifications to the approved programme by additional inputs to ensure completion of the work within the stipulated time. The Contractor will adhere to the revised schedule thereafter. The approval to the revised schedule resulting in a completion date beyond the
stipulated date of completion shall not automatically amount to a grant of extension of time to the Contractor.

43.6 Contractor shall submit fortnightly/ Monthly (as directed by Engineer-In-Charge) progress reports (5 copies) on a computer based program (program and software to be approved by Engineer-In-Charge) highlighting status of various activities and physical completion of work.

43.7 The Contractor shall send completion report along with as built drawings and maintenance schedule to the office of Engineer-In-Charge, of EPI in writing within a period of 30 days of completion of work.

44.0 **WATER AND ELECTRICITY**

The Contractor shall make his own arrangement for Water & Electrical power for construction and other purposes at his own cost and pay requisite electricity and water charges. The Contractor shall also make standby arrangement for water & electricity to ensure un-interrupted supply.

45.0 **MATERIALS TO BE PROVIDED BY THE CONTRACTOR**

The Contractor shall, at his own expense, provide all materials, required including Cement & Steel for the works.

The Contractor shall at his own expense and without delay, supply to the Engineer-in-Charge samples of materials to be used on the work and shall get the same approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The Contractor shall, if requested by the Engineer-in-Charge furnish proof, to the satisfaction of the Engineer-In-Charge that the materials so comply.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-In-Charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the Contractor shall afford every facility and every assistance and cost in obtaining the right and visit to such access.

The Engineer-In-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-In-Charge shall be at liberty to employ at the expense of the Contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-In-Charge shall also have full power to require other proper materials to be substituted thereof and in case of default, the Engineer-In-Charge may cause the same to the supplies and all
costs which may require such removal and substitution shall be borne by the Contractor.

45.1 **CEMENT AND CEMENT GODOWN**

Cement shall be procured by Contractor of 43 Grade conforming to BIS : 8112 Specification latest edition or higher Grade as directed by the Engineer-In-Charge. The cement shall be procured directly from the reputed manufacturers/ stockist, which will have to be got approved from EPI in advance. Relevant vouchers and test certificates will be produced as and when required. The cement shall be stored by the Contractor in such suitable covered and lockable stores, well protected from climate and atmospheric effect. The cement godown shall be constructed by the Contractor as per CPWD specifications at his own cost. The cement will remain under double lock, one from EPI and other from Contractor. The cement in bags shall be stored in godowns in easy countable position. Cement bags shall be used on first in first out basis. Cement stored for beyond 90 days will be required to be tested at Contractors cost, before use in works.

45.2 **STEEL & STEEL STOCKYARD**

Steel conforming to BIS specifications (latest edition) shall be procured by the Contractor directly from reputed manufacturers/producers as approved by EPI. The manufacturer has to give a certificate that the material supplied is not a re-rolled product. Relevant vouchers & test certificates will be produced by the Contractor. Re-rolled sections will not be allowed.

Reinforcement steel, structural steel shall be stored and stacked in such manner so as to facilitate easy identification, removal etc. The Contractor shall take proper care to prevent direct contact between the steel and the ground/ water for which he shall provide necessary arrangement at his own cost including ensuring proper drainage of area to prevent water logging as per directions of the Engineer-In-Charge. If required, the reinforcement steel shall also be protected, by applying a coat of neat cement slurry over the bars for which no extra payment shall be made.

Test certificates for each consignment of steel shall be furnished and tests to be got carried out by the Contractor at his own cost from the authorized laboratory as per the directions of Engineer-In-Charge, before incorporating the materials in the work.

46.0 **SCHEDULE OF QUANTITIES / BILL OF QUANTITIES**

46.1 The quantities shown against the various items of work are only approximate quantities, which may vary as per the actual requirement at Site.

46.2 All items of work in the Bill of Quantities/ schedule of quantities shall be carried out as per the CPWD/ MORTH (as the case may be) specifications, drawings and instructions of the ENGINEER-IN-CHARGE of EPI and the rates shall include for supply of required materials including proper storage, consumables, skilled & unskilled labour, supervision, tools, tackles, plant & machinery complete
as called for in the detailed specifications and conditions of the contract. No item, which is not covered in the Bill of Quantities, shall be executed by the Contractor without the approval of EPI. In case any Extra/Substituted item is carried out without specific-approval, the same will not be paid.

47.0 ANTI-TERMITE TREATMENT & WATER PROOF TREATMENT

47.1 Pre-construction treatment shall be carried out in co-ordination with the building work and shall be executed in such a manner that the civil works are not hampered or delayed by the anti-termite treatment. The treatment shall be carried out as detailed in BIS: 6313 (Part-II) latest revision. The waterproof treatment shall be of type and specifications as given in the schedule of quantities.

47.2 The treatment against water-proofing of basement, roofs, water retaining areas and termite infestation shall be and remain fully effective for a period of not less than 10(Ten) years to be reckoned from the date of expiry of the Defect Liability period, prescribed in the contract. At any time during the said guarantee period if EPI finds any defects in the said treatment or any evidence of re-infestation, dampness, leakage in any part of buildings or structure and notifies the Contractor of the same, the Contractor shall be liable to rectify the defect or give re-treatment at his own cost and shall commence the work or such rectification or re-treatment within seven days from the date of issue of such letter to him. If the Contractor fails to commence such work within the stipulated period, EPI may get the same done by another agency at the Contractor’s cost and risk and the decision of the Engineer-In-Charge of EPI for the cost payable by the Contractor shall be final and binding upon him.

47.3 Re-treatment if required shall be attended to and carried out by the Contractor within seven days of the notice from Engineer-In-Charge of EPI.

47.4 EPI reserves the right to get the quality of treatment checked in accordance with recognized test methods and in case it is found that the chemicals with the required concentration and rate of application have not been applied, or the water proof treatment is not done as per specifications, the Contractor will be required to do the re-treatment in accordance with the required concentration & specifications at no extra cost failing which no payment for such work will be made. The extent of work thus rejected shall be determined by EPI.

47.5 Water proofing and anti-termite treatment shall be got done through approved / specialized agencies only with prior approval of Engineer-In-Charge.

47.6 The Contractor shall make such arrangement as may be necessary to safeguard the workers and residents of the building against any poisonous effect of the chemicals used during the execution of the work.

47.7 During the execution of work, if any damage shall occur to the treatment already done, either due to rain or any other circumstances, the same shall be rectified and made good to the entire satisfaction of Engineer-In-Charge by the Contractor at his cost.
47.8 The Contractor shall make his own arrangement for all equipments required for the execution of the job.

47.9 The Contractor shall execute Guarantee Bond in the prescribed form as appended for guaranteeing the anti-termite treatment and waterproof treatment.

48.0 INDIAN STANDARDS

Wherever any reference is made to any IS in any particular specifications, Drawings or Bill of Quantities, it means the Indian Standards editions with the amendments current at the last date of receipt of Tender Documents.

49.0 CENTERING & SHUTTERING

Marine plywood only or steel plates of minimum thickness as approved by Engineer-In-Charge shall be used for formwork. The shuttering plates shall be cleaned and oiled after every repetition and shall be used only after obtaining approval of EPI's Engineers at Site. The number of repetitions allowed for plywood and steel shuttering shall be at the discretion of Engineer-In-Charge of EPI depending upon the condition of shuttering surface after each use and the decision of ENGINEER-IN-CHARGE in this regard shall be final and binding on the Contractor. No claim whatsoever on this account shall be admissible.

50.0 CONTROLLED MATERIALS

50.1 The following Controlled materials shall be brought to Site after the approval of EPI.
   a) Water proofing compound.
   b) Cement
   c) Steel
   d) Primer/ Paints/ Varnish etc.
   e) Bitumen
   f) Chemical for anti termite treatment
   g) Any other materials as per discretion of EPI.

50.2 The quantity of Controlled materials shall be measured and recorded in the Measurement books and signed by the Contractor and the Engineer-In-Charge as a check to ensure that the required quantities as required for execution of works as per specifications have been brought to Site for incorporation in the work.

50.3 Controlled materials brought at Site shall be stored as directed by EPI and those already recorded in Measurement book, shall be suitably marked for identification.

50.4 The Contractor shall ensure that the Controlled materials are brought to Site in original sealed containers or packing bearing manufacturer’s markings and
brands (except where the quantity required is a fraction of the smallest packing). Materials not complying with this requirement shall be rejected. The empty containers of such Controlled materials shall not be destroyed/ disposed-off without the written permission of EPI.

50.5 The Contractor shall produce receipted vouchers showing quantities of the materials to satisfy Engineer-In-Charge that the materials comply with the specifications. These vouchers shall be endorsed, dated and initialed by Engineer-In-Charge giving the contract number and name of work and a certified copy of each such voucher signed both by EPI and the Contractor shall be kept on record.

50.6 When the cost of each category of materials is less than Rs.5000/- production of vouchers may not be insisted upon if EPI is otherwise satisfied with the quality and quantity of materials.

51.0 RECORDS OF CONSUMPTION OF CEMENT & STEEL

51.1 For the purpose of keeping a record of cement and steel received at Site and consumption in works, the Contractor shall maintain a properly bound register in the form approved by EPI, showing columns like quantity received and used in work and balance in hand etc. This register shall be signed daily by the Contractor’s representative and EPI’s representative.

51.2 The register of cement & steel shall be kept at Site in the safe custody of EPI’s Engineer during progress of the work. This provision will not, however, absolve the Contractor from the quality of the final product.

51.3 In case cement or steel quantity consumed is lesser as compared to the theoretical requirement of the same as per CPWD/MORTH (as the case may be) specifications/ norms, the work will be devalued and/ or a penal rate (i.e. double the rate at which cement/ steel purchased last) recovery for lesser consumption of cement/ steel shall be made in the item rates of the work done subject to the condition that the tests results fall within the acceptable criteria as per CPWD/MORTH (as the case may be) specifications otherwise the work shall have to be dismantled and redone by the Contractor at no extra cost.

In case of cement, if actual consumption is less than 98% of the theoretical consumption, a recovery shall be effected from the Contractor’s dues at the penal rate for the actual quantity that is lower than 98% of theoretical consumption.

52.0 MATERIALS AND SAMPLES

52.1 The materials/ products used on the works shall be one of the approved make/ brands out of list of manufacturers/ brands/ makes given in the Tender Documents. The Contractor shall submit samples/ specimens out of approved makes of materials/ products to the Engineer-In-Charge for prior approval. In
exceptional circumstances Engineer-In-Charge may allow alternate equivalent makes/ brands of products/ materials at his sole discretion. The final choice of brand/ make shall remain with the Engineer-In-Charge, whose decision in this matter shall be final and binding and nothing extra on this account shall be payable to the Contractor.

In case single brand/ make is mentioned, other equivalent makes/ brands may be considered by the Engineer-In-Charge with prior approval. In case of variance in CPWD/ IS/BIS Specifications from approved products/ makes specification, the specification of approved product/ make shall prevail for which nothing shall be paid extra to the Contractor.

In case no make or brand of any materials, articles, fittings and accessories etc. is specified, the same shall comply with the relevant Indian Standard Specifications and shall bear the ISI/BIS mark. The Engineer of EPI and the Owner shall have the discretion to check quality of materials and equipments to be incorporated in the work, at source of supply or site of work and even after incorporation in the work. They shall also have the discretion to check the workmanship of various items of work to be executed in this work. The Contractor shall provide the necessary facilities and assistance for this purpose.

52.2 The above provisions shall not absolve the Contractor from the quality of final product and in getting the material and workmanship quality checked and approved from the Engineer-In-Charge of EPI.

52.3 The Contractor shall well in advance, produce samples of all materials, articles, fittings, accessories etc. that he proposes to use and get them approved in writing by EPI. The materials articles etc. as approved shall be labelled as such and shall be signed by EPI and the Contractor's representative.

52.4 The approved samples shall be kept in the custody of the Engineer-in-Charge of EPI till completion of the work. Thereafter the samples except those destroyed during testing shall be returned to the Contractor. No payment will be made to the Contractor for the samples or samples destroyed in testing.

52.5 The brands of all materials, articles fittings etc. approved together with the names of the manufacturers and firms from which supplies have been arranged shall be recorded in the Site Order Book.

52.6 The Contractor shall set up and maintain at his cost, a field testing laboratory for all day-to-day tests at his own cost to the satisfaction of the Engineer-In-Charge. This field testing laboratory shall be provided with equipment and facilities to carry out all mandatory field tests as per CPWD/MORTH (as the case may be) specifications. The laboratory building shall be constructed and installed with the appropriate facilities; Temperature and humidity controls shall be available wherever necessary during testing of samples.

All equipments shall be provided by the Contractor so as to be compatible with the testing requirements specified. The Contractor shall maintain all the equipments in good working condition for the duration of the contract.
The Contractor shall provide approved qualified personnel to run the laboratory for the duration of the Contract. The number of staff and equipment available must at all times be sufficient to keep pace with the sampling and testing programme as required by the Engineer-In-Charge.

The Contractor shall fully service the site laboratory and shall supply everything necessary for its proper functioning, including all transport needed to move equipment and samples to and from sampling points on the Site, etc.

The Contractor shall re-calibrate all measuring devices whenever so required by the Engineer-In-Charge and shall submit the results of such measurements without delay.

All field tests shall be carried out in the presence of EPI’s representative. All costs towards samples, materials, collection, transport, manpower, testing, including concrete mix-design etc. shall be borne by the Contractor and are deemed to be included in the rates quoted by him in the Bill of Quantities.

53.0 TESTS AND INSPECTION

53.1 The Contractor shall carry out the various mandatory tests as per specifications and the technical documents that will be furnished to him during the performance of the work. All the tests on materials, as recommended by CPWD, MORTH (as the case may be) and relevant Indian Standard Codes or other standard specifications (including all amendments current at the last date of submission of Tender Documents) shall be got carried out by the Contractor at the field testing laboratory or any other recognized institution/laboratory, at the direction of EPI. All testing charges, expenses etc. shall be borne by the Contractor. All the tests, either on the field or outside laboratories concerning the execution of the work and supply of materials shall be got carried out by the Contractor or EPI at the cost of the Contractor.

53.2 WORKS TO BE OPEN TO INSPECTION

All works executed or under the course of execution in pursuance of this contract shall at all times be open to inspection and supervision of EPI. The work during its progress or after its completion may also be inspected, by Chief Technical Examiner of Government of India (CTE) and/or an inspecting authority of State Government of State in which work is executed and/or by third party checks by Owner/ Clients. The compliance of observations/improvements as suggested by the inspecting officers of EPI/CTE/ State authorities/ Owners shall be obligatory on the part of the Contractor at the cost of Contractor.

54.0 BORROW AREAS

The Contractor shall make his own arrangements for borrow pits and borrow disposal areas including their approaches and space for movement of men, machinery, other equipments as required for carrying out the works. The Contractor shall be responsible for taking all safety measures, getting approval,
making payment of royalties, charges etc. and nothing extra shall be paid to the Contractor on this account and unit rates quoted by the Contractor for various items of Bill of Quantities shall be deemed to include the same.

55.0 BITUMEN WORK

The Contractor shall be responsible for arranging Bitumen/Tar of required grade from source to be approved by the Engineer-In-Charge. No Bitumen work shall be carried out on wet surface or in rainy conditions.

56.0 CARE OF WORKS

From the commencement to the completion of works and handing over, the Contractor shall take full responsibility for care of all the works and in case of any damage/loss to the works or to any part thereof or to any temporary works due to lack of precautions or due to negligence on part of Contractor, the same shall be made good by the Contractor at his own cost.

57.0 WORK IN MONSOON AND DEWATERING

The execution of the work may entail working in the monsoon also. The Contractor must maintain labour force as may be required for the job and plan and execute the construction and erection according to the prescribed schedule. No special/ extra rate will be considered for such work in monsoon. The Contractor’s rate shall be considered inclusive of cost of dewatering required, if any and no extra rate shall be payable on this account.

58.0 NO COMPENSATION FOR FORECLOSURE/CANCELLATION/ REDUCTION OF WORKS

If at any time after the commencement of the work EPI shall for any reason whatsoever is required to abandon the work or does not require the whole work thereof as specified in the Tender to be carried out, the Engineer-In-Charge shall give notice in writing of the fact to the Contractor, who shall have no claim to any payment of compensation whatsoever on account of any profit or advantage which he might have derived from the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been carried out or on foreclosure, neither shall he have any claim for compensation by reason of any alterations having been made in the original Specifications, Drawings, Designs and Instructions which shall involve any curtailment of the work as originally contemplated.

Provided that the Contractor shall be paid the charges on the cartage only of materials actually and bonafide brought to the Site of the work by the Contractor and rendered surplus as a result of the abandonment or curtailment of the work or any portion thereof and then taken back by the Contractor, provided however, that the Engineer-In-Charge shall have in all such cases the option of taking over all or any such materials at their purchase price or at local current rates whichever may be less. In the case of such stores having been issued by EPI
and returned by the Contractor to EPI, credit will be given to him by the Engineer-
In-Charge at rates not exceeding those at which they were originally issued to
him after taking into consideration any deduction for claims on account of any
deterioration or damage while in the custody of the Contractor and in this respect
the decision of the Engineer-In-Charge shall be final.

59.0  RESTRICTION ON SUBLETTING

59.1  The Contractor shall not sublet or assign the whole or part of the works except
where otherwise provided, by the contract and even then only with the prior
written consent of EPI and such consent if given shall not relieve the Contractor
from any liability or obligation under the contract and he shall be responsible for
the acts, defaults or neglects of any sub-Contractor, his agents, servants or
workmen as full as if they were the acts, defaults or neglects of the Contractor,
his agent, servants or workmen provided always that the provision of labour on
piece work basis shall not be deemed to be a subletting under this clause.

59.2  The Contractor may entrust specialist items of works to the agencies specialized
in the specific trade. The Contractor shall give the names and details of such firm
whom he is going to employ for approval of EPI. These details shall include the
expertise, financial status, technical manpower, equipment, resources and list of
works executed and on hand of the specialist agency. Specialist agency shall be
engaged only after obtaining written approval of the Engineer-In-Charge.

60.0  PROHIBITION OF UNAUTHORISED CONSTRUCTION & OCCUPATION

No unauthorized buildings, structures should be put up by the Contractor
anywhere on the project Site, neither any building built by him shall be un-
authorizedly occupied by him or his staff.

61.0  CO-ORDINATION WITH OTHER AGENCIES

Work shall be carried out in such a manner that the work of other Agencies
operating at the Site is not hampered due to any action of the Contractor. Proper
Co-ordination with other Agencies will be Contractor's responsibility. In case of
any dispute the decision of EPI shall be final and binding on the Contractor. No
claim whatsoever shall be admissible on this account.

62.0  SETTING OUT OF THE WORKS

62.1  The Contractor shall be responsible for the true and proper setting out of the
works and for the correctness of the position, levels, dimensions and alignment
of all parts of the works. If at any time during the progress of works, shall any
error appear or arise in the position, levels, dimensions or alignment of any part
of the works, the Contractor shall at his own expenses rectify such error to the
satisfaction of Engineer-in-charge. The checking of any setting out or of any line
or level by the engineers of EPI shall not in any way relieve the Contractor of his
responsibility for the correctness.
62.2 Contractor shall provide permanent bench marks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural, Plumbing and other services Drawings.

63.0 NOTICE BEFORE COVERING UP THE WORK

The Contractor shall give not less than seven days notice before covering up or otherwise placing beyond the reach of measurement any work, to the Engineer-In-Charge in order that the same may be inspected and measured. If any work is covered up or placed beyond the reach of Inspection/ measurement without such notice to the Engineer-In-Charge or his consent being obtained, the same shall be uncovered at the Contractors expenses and he shall have to make it good at his own expenses.

64.0 SITE CLEARANCE

64.1 The Contractor shall ensure that the working Site is kept clean and free of obstructions for easy access to job Site and also from safety point of view. Before handing over the work to EPI the Contractor shall remove all temporary structures like the site offices, cement godown, stores, labour hutments etc., scaffolding rubbish, left over materials tools and plants, equipments etc., clean and grade the Site to the entire satisfaction of the Engineer-In-Charge. If this is not done the same will be got done by EPI at his risk and cost.

64.2 The Contractor shall clean all floors, remove cement/ lime/ paint drops and deposits, clean joinery, glass panes etc., touching all painter’s works and carry out all other necessary items of works to make the premises clean and tidy before handing over the building, and the rates quoted by the Contractor shall be deemed to have included the same.

65.0 VALUABLE ARTICLES FOUND AT SITE

All gold, silver and other minerals of any description and all precious stones, coins, treasure, relics, antiques and all other similar things which shall be found in, under or upon the Site, shall be the property of the Owner/ Government and the Contractor shall duly preserve the same to the satisfaction of Engineer-In-Charge and shall from time to time deliver the same to such person or persons indicated by EPI.

66.0 MATERIALS OBTAINED FROM DISMANTLEMENT TO BE OWNER’S PROPERTY

All materials like stone, boulders and other materials obtained in the work of dismantling, excavation etc. will be considered Owner/ government property and may be issued to the Contractor by the Owner/ EPI, if required for use in this work at rates approved by EPI or the Contractor may be asked to dispose off these items at his cost.

67.0 SET-OFF OF CONTRACTOR’S LIABILITIES

EPI shall have the right to deduct or set off the expenses incurred or likely to be incurred by it in rectifying the defects and/or any claim under this agreement
against the Contractor from any or against any amount payable to the Contractor under this agreement including Retention Money and proceeds of Security Deposit cum Performance Guarantee and from any other contract being executed by the Contractor for EPI.

68.0 MATERIALS PROCURED WITH THE ASSISTANCE OF EPI

If any material for the execution of this contract is procured with the assistance of EPI either by issue from its stores or purchase made under orders or permits or licences obtained by EPI, the Contractor shall hold and use the said materials economically and solely for the purpose of this contract and shall not dispose them without the written permission of Engineer-In-Charge. The Contractor, if required by EPI, shall return all such surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination on whatsoever reason, on being paid or credited such price as EPI shall determine having due regard to the conditions of materials.

69.0 ALTERATION IN SPECIFICATION, DESIGN & DRAWING

69.1 The Engineer-In-Charge shall have power to make any alterations in, omissions from, additions to or substitutions for, the original Specifications, Drawings, Designs and Instructions that may appear to him to be necessary during the progress of the work, and the Contractor shall carry out the work in accordance with any instructions which may be given to him in writing signed by the Engineer-In-Charge and such alterations, omissions, additions, or substitutions shall not invalidate the contract and any altered, additional or substituted work which the Contractor may be directed to do in the manner above specified as part of the work shall be carried out by the Contractor on the same conditions in all respects on which he agreed to do the main work.

The time for the completion of the work shall be extended in the proportion that the altered, additional or substituted work price bears to the original contract work price, and the certificate of the Engineer-In-Charge shall be conclusive as to such proportion. Over and above this, a further period to the extent of 25 percent of such extension shall be allowed to the Contractor.

The rates for such additional, altered or substituted work under this clause shall be worked out in accordance with the following provisions in their respective order:

i) If the rates for the additional, altered or substituted work are specified in the contract for the work, the Contractor is bound to carry out the additional, altered or substituted work at the same rates as are specified in the contract for the work.

ii) If the rates for the additional, altered or substituted work are not specifically provided in the contract for the work, the rates will be derived from the rates for a nearest similar item of work as are specified in the contract for the work. In case of composite tenders where two or more
schedule of quantities/ Bill of Quantities form part of the contract, the rates shall be derived from the nearest similar item in the schedule of quantities/Bill of Quantities of the particular part of work in which the deviation is involved failing that from the lowest of the nearest similar item in other schedule of quantity. The opinion of the Engineer-In-Charge as to whether or not the rate can be reasonably so derived from the item in this contract will be final and binding on the Contractor.

iii) If the altered, additional or substituted work includes any work for which no rate is specified in the contract for the work and which cannot be derived in the manner specified in sub para (i) and (ii) above from the similar class of work in the contract then such work shall be carried out at the rates entered in the Schedule of Rates (as mentioned in “Memorandum” to the “Form of Tender” for Civil/ Sanitary Works) minus/plus the percentage which the tendered amount of scheduled items bears with the estimated amount of schedule items based on the Schedule of Rates ( as mentioned in “Memorandum” to the “Form of Tender” for Civil/ Sanitary Works ). The scheduled items mean the items appearing in the Schedule of Rates (as mentioned in “Memorandum” to the “Form of Tender” for Civil/ Sanitary Works), which shall be applicable in this clause. This clause will apply mutatis mutandis to electrical work except that Electrical Schedule of Rates as mentioned in “Memorandum” to the “Form of Tender” will be considered in place of Civil/ Sanitary works Schedule of rates as mentioned in “Memorandum” to the “Form of Tender”.

iv) If the rates for the altered, additional or substituted work cannot be determined in the manner specified in sub-clauses (i) to (iii) above, 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 10% (Ten 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.

v) Except in case of items relating to foundations, provisions contained in sub-clauses (i) to (iv) above shall not apply to contract, altered or substituted items as individually exceed the ‘deviation limit’ of plus/minus 25% (Twenty Five Percent) subject to the following:-

(a) Deviation limit shall apply to individual items.
(b) The value of additions of items, of any individual trade not already included in the contract, shall not exceed 20% of the Tendered value of work, subject to overall deviation limit as given above.

Provided further that in case where the original item is substituted, the Substituted Item shall be deemed to have replaced the original item in the contract itself to that extent and above provisions pertaining to the deviations shall apply with respect to such Substituted Item and not the original item.

NOTE: Individual trade means the trade section to which Bill of Quantities annexed to the agreement has been divided or in the absence of any such division the individual section of the MORTH/C.P.W.D. (as the case may be) Scheduled of rates specified above, such as excavation and earthwork, Concrete, wood work and joinery, etc.

The rate of any such work except the items relating to foundations which is in excess of the deviation limit and deviation in quantities of AHR items on plus side as contained in Clause 9.2(i) shall be determined in accordance with the provisions contained in Clause 69.2.

69.2 In the case of contract items, substituted items, Contract cum substituted items or additional items which exceed the limits laid down in sub para (v) of condition 69.1 above (except the items relating to foundation work, which the Contractor is required to do under Clause 69.1 above and deviation in quantities of AHR items on plus side as contained in clause 9.2 (i)), the Contractor may within fifteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis, for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities or those derived in accordance with the provisions of sub para (i) to (iii) of conditions 69.1 by more than five percent, the Engineer-In-Charge shall within three months of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the Contractor, determine the rates on the basis of the market rates and if the rates so determined exceed the rates specified in the schedule of quantities or those derived in accordance with the provisions of sub paras (i) to (iii) of condition 69.1 by more than five percent, the contract shall be paid in accordance with the rates determined. In the event of the Contractor failing to claim revision of rates within the stipulated period, or if the rates determined by the Engineer-In-Charge within the period of three months of receipt of the claims supported by analysis are within five percent of the rates specified in the schedule of quantities or of those determined in accordance with the provisions of sub-para (i) to (iii) of condition 69.1, the Engineer-In-Charge shall make payment at the rates as specified in the schedule of quantities or those already determined under sub para (i) to (iii) of condition 69.1 for the quantities in excess of the limits laid down in sub para (v) of condition 69.1.

69.3 The provisions of the proceeding paragraph shall apply to the decrease in the rates of items for the work in excess of the limits laid down in sub para (v) of
condition 69.1 provided that such decrease is more than five percent of rates specified in the schedule of quantities or those derived in accordance with the provisions of sub para (i) to (iii) of condition 69.1 and the Engineer-In-Charge may after giving notice to the Contractor within two months of receipt of order by the Contractor or occurrence of the excess and after taking into consideration any reply received from him within fifteen days of receipt of the notice revise the rates for the work in question within two months of expiry of the said period of fifteen days having regard to the market rates.

69.4 The Contractor shall send to the Engineer-In-Charge once every three months an up to date account giving complete details of all claims for additional payments to which the Contractor may consider himself entitled and of all additional work ordered by the Engineer-In-Charge which he has executed during the preceding quarter failing which the Contractor shall be deemed to have waived his right.

69.5 For the purpose of operation of clause 69.1 (v) the following works shall be treated as works relating to foundation:-

i) For buildings, compound walls plinth level or 1.2 meters (4 feet) above ground level whichever is lower excluding items of flooring and D.P.C. but including base concrete below the floors.

ii) For abutments, piers, retaining walls of culverts and bridges, walls of water reservoirs the bed of floor level.

iii) For retaining walls where floor level is not determinate 1.2 meters above the average ground level or bed level.

iv) For Roads all items of excavation and filling including treatment of sub base and soiling work.

v) For water supply lines, sewer lines, under-ground storm water drains and similar works. All items of work below ground level except items of pipe work, masonry work.

vi) For open storm water drains, all items of work except lining of drains.

70.0 ACTION AND COMPENSATION PAYABLE IN CASE OF BAD WORK

If it shall appear to the Engineer-In-Charge or his authorized subordinate in charge of the work or to the Chief Technical Examiner or to any other inspecting agency of Government/ State Government/ Owner where the work is being executed, that any work has been executed with unsound, imperfect, or unskillful workmanship or with materials of any inferior description, or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract, the Contractor shall on demand in writing which shall be made within six months of the completion of the work from the ENGINEER-IN-CHARGE specifying the work, materials or articles complained of notwithstanding that the same may have been passed, Certified and paid for forthwith rectify, or remove and
reconstruct the work so specified in whole or in part as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own proper charge and cost, and in the event of his failing to do so within a period to be specified by the Engineer-In-Charge in his demand aforesaid, then the Contractor shall be liable to pay compensation at the rate of one percent of the estimated amount put to tender for every day not exceeding ten days, while his failure to do so shall continue and in the case of any such failure, the Engineer-In-Charge may rectify or remove and re-execute the work or remove and replace with others, the material or articles complained of as the case may be at the risk and expense in all respects of the Contractor.

71.0 POSSESSION PRIOR TO COMPLETION

71.1 EPI shall have the right to take possession of or use any completed or partially completed work or part of the work. Such possession or use shall not be deemed to be any acceptance of any work not completed in accordance with the contract agreement. If such prior possession or use by EPI delays the progress of work an equitable adjustment in the time of completion will be made and the contract agreement shall be deemed to be modified accordingly. The decision of EPI in this case shall be final binding and conclusive.

71.2 When the whole of the works or the items or the groups of items of work for which separate periods of completion have been specified have been completed the Contractor will give a notice to that effect to the Engineer in writing. The Engineer shall within 15 days of the date of receipt of such notice inspect the works and either the Engineer-In-Charge issues to the Contractor a completion certificate stating the date on which in his opinion the works were completed in accordance with the contract or gives instructions in writing to the Contractor specifying the balance items of work which are required to be done by the Contractor before completion certificate could be issued. The Engineer-In-Charge shall also notify the Contractor of any defect in the works affecting completion.

71.3 The Contractor shall during the course of execution prepare and keep updated a complete set of ‘as built’ drawings to show each and every change from the Contract Drawings, changes recorded shall be countersigned by the Engineer-In-Charge and the Contractor. Four copies of ‘as built’ drawings shall be supplied to EPI by the Contractor within 30 days of the completion. All costs incurred in this respect shall be borne by the Contractor only.

72.0 COMPENSATION FOR DELAY AND REMEDIES

72.1 If the Contractor fails to maintain the required progress in terms of clause 72.4 or relevant clause of Additional Conditions of Contract, to complete the work and clear the Site on or before the completion date 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 the amount calculated at the rates stipulated below or such smaller amount as the Engineer in charge (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every completed day / week (as
applicable) that the progress remains below that specified in Clause 72.4.1 or the relevant clause in Additional Conditions of Contract or that the work remains incomplete. This will also apply to items or group of items for which a separate period of completion has been specified.

i) For works with completion period not exceeding 3 month (as originally stipulated) @ 1% per day

ii) For works with completion period exceeding 3 months (as originally stipulated) @ 1% per week or part thereof

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 or of the Tendered Value of the item or group of items of work for which a separate period of completion is originally given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with EPI even after completion of the work.

72.2 CANCELLATION / DETERMINATION OF CONTRACT IN FULL OR PART

Subject to other provisions contained in this clause, the Engineer-In-Charge may, without prejudice to his any other rights or remedy against the Contract in respect of any delay, inferior workmanship, any claims for damages and / or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in full or in part in any of the following cases:

i) If the Contractor having been given by the Engineer-In-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workmanlike manner shall omit to comply with the requirement of such notice for a period of seven days thereafter; or

ii) If the Contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the ENGINEER-IN-CHARGE (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-In-Charge; or

iii) If the Contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that respect by the Engineer-In-Charge; or

iv) If the Contractor persistently neglects to carry out his obligations under the contract and / or commits default in complying with any of the terms
and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that respect by the Engineer-In-Charge; or

v) If the Contractor shall offer or give or agree to give to any person in EPI service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any action in relation to the obtaining or execution of this or any other contract for EPI; or

vi) If the Contractor shall enter into a contract with EPI in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-In-Charge; or

vii) If the Contractor shall obtain a contract with EPI as a result ofwrong tendering or other non-bona-fide methods of competitive tendering; or

viii) If the Contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors; or

ix) If the Contractor being a company, shall pass a resolution or the Court shall make an order for the winding up of the company, or a receiver or manager on behalf of the debenture holders or otherwise shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or manager; or

x) If the Contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days; or

xi) If the Contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of the labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer sublet or otherwise parts with the entire works or any portion thereof without and prior written approval of the Engineer-In-Charge.

When the Contractor has made himself liable for action under any of the clauses aforesaid, the Engineer-In-Charge may without prejudice to any other right or remedy which shall have accrued or shall accrue hereafter to EPI, by a notice in
writing to cancel the contract as a whole or only such items of work in default from the Contract.

The Engineer-In-Charge shall on such cancellation by EPI have powers to:

a) Take possession of Site and any materials, Construction Plant & machinery, implements, stores, etc. thereon; and/ or

b) Carry out the incomplete work by any means at the risk and cost of the Contractor; and/ or

c) To determine or rescind the contract as aforesaid (of which termination or rescission notice in writing to the Contractor under the hand of the Engineer-In-Charge shall be conclusive evidence). Upon such determination or rescission the full Retention Money recovered by EPI under the contract and Security Deposit cum Performance Guarantee shall be liable to be forfeited and un-used materials, construction plant & machinery, implements, temporary buildings, etc. shall be taken over and shall be absolutely at the disposal of EPI. If any portion of the Retention Money has not been received or recovered by EPI from RA Bills, it would be called for and forfeited; and/ or

d) To employ labour and to supply materials, equipment to carry out the work or any part of the work debiting the Contractor with the cost of the labour and the price of the materials, equipment rentals (of the amount of which cost and price certified by the Engineer-In-Charge shall be final and conclusive) against the Contractor and crediting him with the value of the work done in all respects in the same manner and at the same rates as if it had been carried out by the Contractor under the terms of his contract. The certificate of the Engineer-In-Charge as to the value of the work done shall be final and conclusive against the Contractor provided always that action under the sub-clause shall only be taken after giving notice in writing to the Contractor. Provided also that if the expenses incurred by the EPI are less than the amount payable to the Contractor at his agreement rates, the difference shall not be paid to the Contractor; and/ or

e) After giving notice to the Contractor to measure up the work of the Contractor and to take such whole, or the balance or part thereof as shall be un-executed or delayed with reference to the General Conditions of Contract clause no. 72.4.1 and/ or relevant clause of Additional Conditions of Contract, out of his hands and to give it to another Contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original Contractor if the whole work had been executed by him (of the amount of which excess the certificate in writing of the Engineer-In-Charge shall be final and conclusive) shall be borne and paid by the original Contractor and may be deducted from any money due to him by EPI under his contract or on any other account whatsoever or from his Retention Money, Security Deposit cum Performance Guarantee or the proceeds of sales of unused materials, construction plants & machinery, implements temporary buildings etc. thereof or a sufficient part thereof as
the case may be. If the expenses incurred by EPI are less than the amount payable to the Contractor at his agreement rates, the difference shall not be paid to the Contractor; and/or

f) By a notice in writing to withdraw from the Contractor any items or items of work as the Engineer-In-Charge may determine in his absolute discretion and get the same executed at the risk and cost of the Contractor.

Any excess expenditure incurred or to be incurred by EPI in completing the works or part of the works or the excess loss or damages suffered or may be suffered by EPI as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to EPI in law be recovered from any moneys due to the Contractor on any account, and if such moneys are not sufficient the Contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the Contractor shall fail to pay the required sum within the aforesaid period of 30 days, the Engineer-In-Charge shall have the right to sell any or all of the Contractors unused materials, Construction Plant, machinery, implements, temporary buildings, etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the Contractor under the contract and if thereafter there be any balance outstanding from the Contractor, it shall be recovered in accordance with the provisions of the contract and law.

Any sums in excess of the amounts due to EPI and unsold materials, Construction Plant etc. shall be returned to the Contractor, provided always that if cost or anticipated cost of completion by EPI of the works or part of the works is less than the amount which the Contractor would have been paid had he completed the works or part of the works, such benefit shall not accrue to the Contractor.

In the event of anyone or more of the above courses being adopted by the Engineer-In-Charge the Contractor shall have no claim to compensation whatsoever for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid the Contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-In-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified. Provided further that if any of the recoveries to be made, while taking action as per (d) and/or (e) above, are in excess of the Retention Money & Security Deposit cum Performance Guarantee forfeited, these shall be limited to the amount by which the excess cost incurred by the EPI exceeds the Retention Money & Security Deposit cum Performance Guarantee so forfeited.
72.3 CONTRACTOR LIABLE TO PAY COMPENSATION EVEN IF ACTION NOT TAKEN

In any case in which any of the powers conferred upon the Engineer-In-Charge by relevant clause thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the Contractor and the liability of the Contractor for compensation shall remain unaffected. In the event of the Engineer-In-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the Contractor, take possession of (or at the sole discretion of the Engineer-In-Charge which shall be final and binding on the Contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-In-Charge) all or any tools, plant, machinery, materials and stores, in or upon the works, or the site thereof belonging to the Contractor, or procured by the Contractor and intended to be used for the execution of the work / or any part thereof, paying or allowing for the same in account at the contract rates, or in the case of these not being applicable, at current market rates to be certified by the Engineer-In-Charge, whose certificate thereof shall be final, and binding on the Contractor and/or direct the Contractor, clerk of the works, foreman or other authorized agent to remove such tools, machinery, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the Contractor failing to comply with any such requisition, the Engineer-In-Charge may remove them at the Contractor's expense or sell them by auction or private sale on account of the Contractor and his risk in all respects and the certificate of the Engineer-In-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the Contractor.

72.4 TIME ESSENCE OF CONTRACT & EXTENSION FOR DELAY

The time allowed for execution of the Works as specified in the terms of contract or the extended time in accordance with these conditions shall be the essence of the contract. The execution of the works shall commence from the 10th Day or such time period as mentioned in letter of Intent after the date on which the Engineer-In-Charge issues written orders to commence the work. If the Contractor commits default in commencing the execution of the work as aforesaid, the Executing Agency shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money absolutely.

72.4.1 Within 10 (Ten) days 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 of the works. It shall indicate the forecast (mile-stones) 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 stipulated in the Contract documents, and further to ensure good progress during the execution of the work, the Contractor shall in all cases in which the time allowed for any work exceeds one month (save for
special jobs for which a separate program has been agreed upon) complete 1/8\textsuperscript{th} of the whole of work before 1/4\textsuperscript{th} of the whole time allowed in the contract has elapsed, 3/8\textsuperscript{th} of the work before one half of such time has elapsed and 3/4\textsuperscript{th} of the work before 3/4\textsuperscript{th} of such time has elapsed. The physical report including photographs shall be submitted by the Contractor on the prescribed format & the intervals (not exceeding a month) as decided by the Engineer in Charge. The compensation for delay as per clause 72.1 shall be leviable at intermediate stages also, in case the required progress is not achieved to meet the above 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\% (Ten Percent) of the tendered value of work\textsuperscript{a}.

72.4.2 If the work(s) be delayed by:

i) force-majeure or
ii) abnormally bad weather, or
iii) serious loss or damage by fire, or
iv) civil commotion of workmen, strike or lockout, affecting any or the trades employed on the work, or
v) delay on the part of other Contractors or tradesmen engaged by Engineer-In-Charge in executing work not forming part of the Contract, or
vi) non-availability of stores, which are responsibility of EPI or,
vi) non-availability or break down of tools and plant to be supplied or supplied by EPI or,
viii) any other cause which, in the absolute discretion of EPI, is beyond the Contractor’s control,

then, upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-In-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-In-Charge to proceed with the works.

72.4.3 Request for extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay on the prescribed form. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired. In any such case EPI may give a fair and reasonable extension of time for completion of work. Such extension shall be communicated to the Contractor by the Engineer-In-Charge in writing, within 3 months of the date of receipt of such request. Non-application by the Contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the Engineer-In-Charge and the extension of time so given by the Engineer-In-Charge shall be binding on the Contractor.

73.0 WITHHOLDING AND LIEN IN RESPECT OF SUMS DUE FROM CONTRACTOR

73.1 Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the Contractor, EPI shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security,
if any, deposited by the Contractor and for the purpose aforesaid, EPI shall be entitled to withhold the Retention Money, if any, furnished as the case may be and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the Contractor, EPI shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the Contractor under the same contract or any other contracts pending finalization or adjudication of any such claim.

73.2 It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-In-Charge or EPI will be kept withheld or retained as such by the Engineer-In-Charge or EPI till the claim arising out of or under the contract is determined by the Arbitrator / Competent Court and that the Contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the Contractor. For the purpose of this clause, where the Contractor is a sole proprietor or a partnership firm or a limited company, etc. the Engineer-In-Charge or EPI shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to proprietor /partnership firm/limited company, as the case may be whether in his individual capacity or otherwise.

EPI shall have the right to cause an audit and technical examination of the works and the final bills of the Contractor including all supporting vouchers, abstract, etc, to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the Contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the Contractor shall be liable to refund the amount of over-payment and it shall be lawful for EPI to recover the same from him in the manner prescribed in sub-clause (I) of this clause or in any other manner legally permissible; and if it is found that the Contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by EPI to the Contractor, without any interest thereon whatsoever.

73.3 LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

Any sum of money due and payable to the Contractor (including the Retention Money & Security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-In-Charge or by EPI against any claim of the Engineer-In-Charge or EPI in respect of payment of a sum of money arising out of or under any other contract made by the Contractor with the Engineer-In-Charge or EPI.

It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-In-Charge or EPI will be kept withheld or retained as such by the Engineer-In-Charge or EPI or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the Arbitrator or Competent court as the case may be, and that the Contractor shall have no claim for interest or damages whatsoever on this account or on any
other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the Contractor.

74.0 DEFECTS LIABILITY PERIOD

The Contractor shall be responsible for the rectification of defects in the works for a period of twelve months from the date of taking over of the works by the Owner/Client. Any defects discovered and brought to the notice of the Contractor forthwith shall be attended to and rectified by him at his own cost and expense. In case the Contractor fails to carry out these rectifications, the same may without prejudice to any other right or remedy available, be got rectified by EPI at the cost and expense of the Contractor.

75.0 FORCE MAJEURE

Any delay or failure of the performance of either party hereto shall not constitute default hereunder to give rise to any claims for damages, if any to the Extent such delay or failure of performance is caused by occurrences such as Acts of God or the public enemy, expropriation, compliance with any order or request of Government authorities/Courts, acts of war, rebellions, sabotage fire, floods, illegal strikes, or riots (other than Contractor's employees). Only extension of time shall be considered for Force Majeure conditions as accepted by EPI. No adjustment in contract price shall be allowed for reasons of force majeure.

76.0 ARBITRATION

76.1 Before resorting to arbitration as per the clause given below, the parties if they so agree may explore the possibility of conciliation as per the provisions of Part-III of the Arbitration and Conciliation Act. 1996. When such conciliation has failed, the parties shall adopt the following procedure for arbitration:

i) Except where otherwise provided for in the contract, any disputes and differences relating to the meaning of the Specifications, Design, Drawings and Instructions herein before mentioned and as to the quality of workmanship or materials used in the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the Contract, Designs, Drawings, Specifications, Estimates, Instructions, or these conditions, or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the Sole Arbitration of the Chairman and Managing Director (CMD) of Engineering Projects (India) Limited (EPI), or any other person discharging the functions of CMD of EPI and if CMD or such person discharging the functions of CMD of EPI is unable to act, to the sole Arbitration of some other person appointed by CMD of EPI or such other person discharging the functions of CMD of EPI. There will be no objection if the arbitrator so appointed is an employee of Engineering Projects (I) Ltd. However, such an employee shall not have directly dealt with the said Contract or the works there under on behalf of EPI. Such Arbitrator shall be appointed within 30 days of the receipt of letter of invocation of arbitration duly satisfying the requirements of this clause.
ii) If the arbitrator so appointed resigns or is unable or unwilling to act due to any reason whatsoever, or dies, the Chairman & Managing Director aforesaid or in his absence the person discharging the duties of the CMD of EPI may appoint a new arbitrator in accordance with these terms and conditions of the contract, to act in his place and the new arbitrator so appointed may proceed from the stage at which it was left by his predecessor.

iii) It is a term of the contract that the party invoking the arbitration shall specify the dispute / differences or questions to be referred to the Arbitrator under this clause together with the amounts claimed in respect of each dispute.

iv) The Arbitrator may proceed with the arbitration ex-parte, if either party, in spite of a notice from the arbitrator, fails to take part in the proceedings.

v) The work under the contract shall continue as directed by the Engineer-In-Charge, during the arbitration proceedings.

vi) Unless otherwise agreed, the venue of arbitration proceedings shall be at the venue given in the ‘Memorandum’ to the ‘Form of Tender’.

vii) The award of the Arbitrator shall be final, conclusive and binding on both the parties.

viii) Subject to the aforesaid, the provisions of the Arbitration and Conciliation Act, 1996 or any statutory modifications or re-enactment thereof and the Rules made there under and for the time being in force shall apply to the arbitration proceedings and Arbitrator shall publish his Award accordingly.

NOTE

NOTWITHSTANDING ANYTHING CONTAINED HEREINABOVE, THIS CLAUSE SHALL NOT BE APPLICABLE WHERE THE DISPUTE IS BETWEEN EPI AND ANOTHER CENTRAL PUBLIC SECTOR ENTERPRISE OR GOVT. OF INDIA DEPARTMENT, FOR WHICH A SEPARATE ARBITRATION CLAUSE IS PROVIDED VIDE CLAUSE NO. 76.2 GIVEN BELOW :

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 Memorandums / 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 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, Government of India or any modification issued in this regard.

76.3 JURISDICTION

The courts mentioned in the ‘Memorandum’ to the ‘Form of Tender’ alone will have jurisdiction to deal with matters arising from the contract, to the exclusion of all other courts.

77.0 SUSPENSION OF WORKS

(a) The Contractor shall, on receipt of the order in writing of the Engineer-In-Charge, suspend the progress of the works or any part thereof for such time and in such manner, as the Engineer-In-Charge may consider necessary for any of the following reasons:

i) On account of any default on part of the Contractor, or

ii) For proper execution of the works or part thereof for reason other than the default of the Contractor, or

iii) For safety of the works or part thereof.

The Contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-In-Charge.

(b) If the suspension is ordered for reasons (ii) and (iii) in sub-para (a) above, the Contractor shall be entitled to an extension of the time equal to the period of every such suspension plus 25%. No adjustment of contract price will be allowed for reasons of such suspension.

(c) In the event of the Contractor treating the suspension as an abandonment of the contract by EPI, he shall have no claim to payment of any compensation on account of any profit or advantage which he may have derived from the execution of the work in full but which he could not derive in consequence of the abandonment.

(d) The Contractor shall resume work in all earnestness after suspension has been lifted by EPI.

78.0 TERMINATION OF CONTRACT ON DEATH OF CONTRACTOR

If the Contractor is an individual or a proprietorship concern and the individual or the proprietor dies then unless the Engineer-In-Charge is satisfied that the legal representatives of the individual Contractor or of the proprietor of the proprietary concern and in the case of partnership firm, the surviving partners, are capable of carrying out and completing the contract, the Engineer-In-Charge shall be entitled to cancel the contract as to its incompleted part without EPI being in any
way liable to payment of any compensation to the estate of the deceased Contractor and/or to surviving partners of the Contractor's firm on account of cancellation of the contract. Such cancellation of Contract shall be with out prejudice to any of the rights & remedies available to the Engineer-In-Charge under the contract. The decision of the Engineer-In-Charge that the legal representatives of the deceased Contractor or the surviving partners of the Contractor's firm cannot carry out and complete the contract shall be final and binding on the parties.

79.0 CLARIFICATION AFTER TENDER SUBMISSION

Tenderer’s attention is drawn to the fact that during the period, the bids are under consideration, the bidders are advised to refrain from contacting by any means, EPI and/or his employees/ representatives on matters related to the bid under consideration and that if necessary, EPI will obtain clarifications in writing or as may be necessary. The Tender evaluation and process of award of works is done by duly authorized Tender Scrutiny Committee and this committee is authorized to discuss and get clarification from the tenderers.

80.0 ADDENDA/ CORRIGENDA

Addenda/Corrigenda to the Tender Documents may be issued prior to the date of opening of the Tender to clarify or effect modification in specification and/or contract terms included in various Tender Documents. The tenderer shall suitably take into consideration such Addenda/Corrigenda while submitting his tender. The tenderer shall return such Addenda/ Corrigenda duly signed and stamped as confirmation of its receipt and submit alongwith the Tender Document. All Addenda/ Corrigenda shall be signed and stamped on each page by the tenderer and shall become part of the Tender and contract documents.

81.0 QUALITY ASSURANCE PROGRAMME

To ensure that the works/services under the scope of this contract are in accordance with the specifications, the Contractor shall adopt Quality Assurance Programme to control such activities at the necessary points. The Contractor shall prepare and finalize such Quality Assurance Programme within 15 days from letter of intent. EPI shall also carryout quality audit and quality surveillance of systems and procedures of Contractor’s quality control activities. A Quality Assurance Programme of Contractor shall generally cover the following:

a) His organization structure for the management and implementation of the proposed Quality Assurance Program.
b) Documentation control system.
c) The procedure for procurement of materials and source inspection.
d) System for site controls including process controls.
e) Control of non-conforming items and systems for corrective actions.
f) Inspection and test procedure for site activities.
g) System for indication and appraisal of inspection status.
h) System for maintenance of records.
i) System for handling, storage and delivery.
j) A quality plan detailing out quality practices and procedures, relevant standards and acceptance levels for all types of work under the scope of this contract.

All the quality reports shall be submitted by the Contractors in the formats appended hereto. Checklist enclosed here in this document shall be followed while carrying out Construction activities (items). If any item is not covered by the Checklist/Formats appended hereto, the Format for the same may be developed and submitted to Engineer-In-Charge for approval and the same shall be adopted. These filled in formats shall be prepared in two copies and duly signed by representatives of Contractor and EPI. All the costs associated with printing of Formats and testing of materials required as per technical specifications or by Engineer-In-Charge shall deemed to be included in the Contractor’s quoted rates of various items of work in the Schedule/ Bill of Quantities.

82.0 APPROVAL OF TEMPORARY / ENABLING WORKS

The setting and nature of all offices, huts, access road to the work areas, and all other temporary works as may be required for the proper execution of the works shall be subject to the approval of the Engineer-In-Charge.

All the equipments, labour, material including cement, reinforcement and the structural steel required for the enabling/ temporary works associated with the entire Contract shall have to be arranged by the Contractor only. Nothing extra shall be paid to the Contractor on this account and the unit rates quoted by the Contractor for various items in the Bill of Quantities shall be deemed to include the cost of enabling works.

83.0 CONTRACT COORDINATION PROCEDURES, COORDINATION MEETINGS AND PROGRESS REPORTING

The Contractor shall prepare and finalize in consultation with EPI, a detailed contract coordination procedure within 15 days from the date of issue of Letter of Intent for the purpose of execution of the Contract.

The Contractor shall have to attend all the meetings at any place in India at his own cost with EPI, Owners/ Clients or Consultants of EPI/ Owner/ Client during the currency of the Contract, as and when required and fully cooperate with such persons and agencies involved during these discussions. The Contractor shall not deal in any way directly with the Clients/ Owners or Consultants of EPI/ Owner/ Clients and any dealing/ correspondence if required at any time with Clients/ Owners/ Consultants shall be through EPI only.

During the execution of the work, Contractor shall submit at his own cost detailed Monthly progress report to the Engineer-In-Charge of EPI by 5th of every month. The format of monthly progress report shall be as approved by Engineer-In-Charge of EPI.

84.0 CONTRACT AGREEMENT
The Contractor shall enter into a Contract Agreement with EPI within 10 days of the date of Letter of Intent or within such extended time, as may be granted by EPI. The cost of stamp papers, stamp duty, registration, if applicable on the contract, shall be borne by the Contractor. In case, the Contractor does not sign the agreement as above or does not start the work within 10 days of the issue of letter/telegram of intent, his earnest money is liable to be forfeited and letter of intent consequently will stand withdrawn.

85.0 MANNER OF EXECUTION OF AGREEMENT

i. The agreement as per prescribed Performa as enclosed to the Additional Conditions of Contract shall be signed at the office of EPI within 10 days from the date of issue of Letter of Intent. The Contractor shall provide for signing of the Contract, appropriate Power of Attorney in favour of the authorised representative duly attested by notary Public and the requisite documents/materials. Till a formal contract is prepared and executed, the Letter of Intent read in conjunction with the Bidding Documents will constitute a binding contract.

ii. The agreement will be signed in two originals and three more copies, EPI shall retain the ‘Original’, the Contractor shall be provided with the other signed original and the remaining three copies will be retained by EPI. In case of a dispute of any kind whatsoever, the ‘Original’ retained by EPI alone shall be treated as the ‘Original Agreement’.

iii. The Contractor shall provide free of cost to EPI all the Engineering data, drawings and descriptive materials submitted along with the bid, in at least five (5) copies to form an integral part of the Agreement within seven 7 days after issuing of Letter of Intent.

iv. Subsequent to signing of the Agreement, the Contractor at his own cost shall provide to EPI with at least five (5) true hard bound copies of Agreement alongwith all the enclosures viz. letter of intent, Tender Documents etc. within thirty (30) days of its signing.

86.0 PURCHASE PREFERENCE TO PUBLIC SECTOR ENTERPRISES

EPI reserves its right to extend Purchase Preference to Central Public Sector Enterprises (CPSEs) as per policy of Government of India, if any, as applicable on this work. The tenderers are requested to go through latest instructions of Government of India on its Purchase Preference Policy for CPSEs before quoting for the Tender.

87.0 CHANGE IN FIRM’S CONSTITUTION TO BE INTIMATED

Where the Contractor is a partnership firm, prior approval in writing of EPI shall be obtained before any change is made in the constitution of the firm. Where the Contractor is an individual or a Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the Contractor enters into any partnership agreement whereunder the partnership firm would have the right to carry out the works hereby undertaken by the Contractor. If prior approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in
contravention of Clause 59.1 hereof and EPI shall be entitled to take action under Clause 72.2 (xi).

88.0 COMPLIANCE WITH ISO PROCEDURES

EPI is an ISO-9001 and ISO-14001 Company. The conditions of the ISO as applicable shall be followed by the Contractor for implementation & maintaining the established procedures of EPI.
LABOUR SAFETY PROVISIONS

1.0 Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical).

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

3.0 Working platforms, gangways, and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6m (12 feet) above ground level or floor level, they should be closely boarded, should have adequate width & should be suitable fastened as described in (2.0) above.

4.0 Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm (3 feet).

5.0 Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30 feet) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. for ladder up to and including 3m (10 feet) in length. For longer ladders this width should be increased at least 1/4" for each additional 30 cm (1 ft.) of length. Uniform step spacing shall not exceed 30 cm (12"). Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of the work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Contractor shall provide all necessary fencing and lights to protect the public from accident, and shall be bound to bear the expenses of defence of every suit, action or other proceeding at law that may be brought by an person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may, with the consent of the Contractor, be paid to compensate any claim by any such person.

6.0 EXCAVATION AND TRENCHING

All trenches, 1.2mts.(four feet) or more in depth, shall at all times be supplied with at least one ladder for each 30m. (100 feet) in length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 90 cm (3feet) above the surface of the ground. The sides of the trenches, which are 1.5m. (5feet) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger or sides to collapsing. The excavated materials shall not be placed within 1.5m (5 feet) of the edges of the
trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

7.0 Demolition - Before any demolition work is commenced and also during the progress of the work:

7.1 All roads and open areas adjacent to the work Site shall either be closed or suitably protected.

7.2 No electric cable or apparatus which is likely to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

7.3 All practical steps shall be taken to prevent danger to persons employed from risk or fire or explosion or flooding. No floor, roof or other part of the building shall be overloaded with debris or materials as to render it unsafe.

8.0 All necessary personal safety equipments as considered adequate by the Engineer-In-Charge should be kept available for the use of persons employed on the Site and maintained in a condition suitable for immediate use, and the Contractor should take adequate step to ensure proper use of equipment by those concerned- The following safety equipment shall be invariably provided.

8.1 Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

8.2 Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to the eye shall be provided with protective goggles.

8.3 Those engaged in welding works shall be provided with welder’s protective eye shields.

8.4 Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe interval.

8.5 When workers are employed in sewers and manholes, which are in active use, the Contractors shall ensure that the manhole covers are opened and ventilated at-least for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident the public. In addition, the Contractor shall ensure that the following safety measures are adhered to:

a. Entry for workers into the line shall not be allowed except under supervision of the JE or any other higher officer.

b. At least 5 to 6 manholes upstream and down stream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manholes for working inside.

c. Before entry, presence of Toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.

d. Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.
e. Safety belt with rope should be provided to the workers. While working inside the manholes such rope should be handled by two men standing outside to enable him to be pulled out during emergency.

f. The area should be barricaded or cordoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.

g. No smoking or open flames shall be allowed near the blocked manhole being cleaned.

h. The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.

i. Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer In-charge may decide the time up to which a worker may be allowed to work continuously inside the manhole.

j. Gas masks with Oxygen Cylinder should be kept at Site for use in emergency.

k. Air-blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air-blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non-sparking gas engines also could be used but they should be placed at-least 2 meters away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.

l. The workers engaged for cleaning the manholes/ sewers should be properly trained before allowing them to work in the manhole. m. The workers shall be provided with Gumboots or non-sparking shoes, bump helmets and gloves non-sparking tools, safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing the limbs before working inside the sewer lines.

n. Workmen descending a manhole shall try each ladder step or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.

o. If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.

p. The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-In-Charge regarding the steps to be taken in this regard in an individual case will be final.

8.6 The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form Wherever men above the age of 18 are employed on the work of lead painting the following precautions should be taken.

8.6.1 No paint containing lead or lead products shall be used except in the form of paste or readymade paint.

8.6.2 Suitable facemasks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.
8.6.3 Overalls shall be supplied by the Contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.

8.6.4.1 a. White lead, sulphate or lead work products containing those pigments shall not be used in painting operation except in the form of paste or of paints ready for use.

b. Measures shall be taken whenever required in order to prevent danger arising from the application of paint in the form of spray.

c. Measures shall be taken, whenever practicable to prevent danger arising out of dust caused by dry rubbing down and scraping.

8.6.4.2 a. Adequate facilities shall be provided to enable working painter to wash during and on cessation of work.

b. Suitable arrangements shall be made to prevent clothing put off during working hours being spoiled by painting materials.

8.6.4.3 a) Cases of lead poisoning and of suspected lead poisoning shall be notified and shall be subsequently verified by a medical man appointed by the competent authorities of the Consultant.

b) EPI may require when necessary a medical examination of workers.

c) Instructions with regard to the special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

9.0 When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provisions should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.

10.0 Use of hoisting machines and tackle including their attachment encourage and supports shall conform to the following standard of conditions.

10.1 a. These shall be of good mechanical construction, sound material and adequate strength and free from patent, defects and shall be kept required in good working order.

b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.

10.2 Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffolding, winch or giving signals to operator.
10.3 In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

10.4 In case of EPI machines, the safe working load shall be notified by the Engineer-In-Charge. As regards Contractor’s machines the Contractor shall notify the safe working load of the machine to the Engineer-In-Charge whenever he brings any machinery to Site of work and get verified by the Engineer-In-Charge.

11.0 Motors gearing, transmission electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguard, hosting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energized, insulating mats, wearing apparel, such as gloves sleeves and boots as may be necessary, be provided. The worker should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.

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

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

14.0 To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the Contractor shall be open to inspection by the or their representatives.

15.0 Notwithstanding the above Clauses from (i) to (xiv) there is nothing in these to exempt the Contractor from the operations of any other Act or Rule in force in the Republic of India.
MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS

1.0 APPLICATION

These rules shall apply to all building and construction works in which 20 (twenty) or more workers are ordinarily employed or are proposed to be employed in any day during the period during which the Contractor work is in progress.

2.0 DEFINITION

Work place means a place where twenty or more workers are ordinarily employed or are proposed to be employed in connection with construction work on any day during the period during which the Contractor work is in progress.

3.0 FIRST-AID FACILITIES

3.1 At every work place first aid facilities shall be provided and maintained, so as to be easily accessible during working hours, First-Aid boxes at the rate of not less than one box per 150 contract labour or part thereof ordinarily employed.

3.2 The First-Aid box shall be distinctly marked with a red cross on white ground and shall contain the following equipments:-

3.2.1 a) For work places in which number of contract labour employed does not exceed 50, Each First-Aid box shall contain the following equipments:

   i) 6 small sterilized dressings.
   ii) 3 medium size sterilized dressings.
   iii) large size sterilized dressings.
   iv) 3 large sterilized burn dressings.
   v) 1 (30 ml) bottle containing a two percent alcoholic solution of iodine.
   vi) 1(30 ml) bottle containing salvolatile having the dose and mode of administration indicated on the label.
   vii) 1 snake-bite lancet.
   viii) 1 (30 gms) bottle of potassium permanganate crystals.
   ix) 1 pair of scissors.
   x) 1 copy of the First-Aid leaf-let issued by the Director General, Factory Advise Service & Labour Institutes, Government of India.
   xi) 1 bottle containing 100 tablets (each of 5 grams) of aspirin.
   xii) Ointment for burns.
   xiii) A bottle of suitable surgical antiseptic solution.
3.2.2 For work places in which the number of contract labour exceed 50. Each First-Aid box shall contain the following equipments:

i) 12 small sterilized dressings.
ii) 6 medium size sterilized dressings.
iii) 6 large size sterilized dressings.
iv) 6 large size sterilized burn dressings.
v) 6 (15 gms) packet sterilized cotton wool.
vi) 1 (60 ml.) bottle containing a two percent iodine alcoholic solution.
vii) 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
viii) 1 roll of adhesive plaster.
ix) 1 snake – bite lancet.
x) 1 (30 gms.) bottle of potassium permanganate crystals.
xi) 1 pair of scissors.
xii) 1 copy of the First-Aid leaf-let issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
xiii) A bottle containing 100 tablets (each of 5 grams) of aspirin.
xiv) Ointment for burns.
xv) A bottle of suitable surgical antiseptic solution.

3.3 Adequate arrangements shall be made for immediate recoupment of the equipment when necessary.

3.4 Nothing except the prescribed contents shall be kept in the First Aid box.

3.5 The First Aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.

3.6 A person in charge of the First-Aid box shall be a person trained in First-Aid treatment, in work places where the number of labour employed is 150 or more.

3.7 In work places where the number of labour employed is 500 or more and hospital facilities are not available within easy distance of the works, first-Aid Posts shall be established and run by a trained Compounder. The Compounder shall be on duty and shall be available at all hours when the workers are at work.

3.8 Where work places are situated in places, which are not towns of cities, a suitable motor transport shall be kept readily available to carry injured person or persons suddenly taken ill to the nearest hospital.

4.0 DRINKING WATER

4.1 In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

4.2 Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.

4.3 Every water supply of storage shall be at a distance of not less than 50 feet from any latrines drain or other source of pollution, Where water has to be drawn from
an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap-door which shall be dust and waterproof.

4.4 A reliable pump shall be fitted to each covered well, trap-door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5.0 WASHING FACILITIES

5.1 In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of labour employed herein.

5.2 Separate and adequate screening facilities shall be provided for the use of male and female workers.

5.3 Such facilities shall be conveniently accessible and shall be kept clean and hygienic condition.

6.0 LATRINES AND URINALS

6.1 Latrines shall be provided in every work place on the following scale, namely:

   a) Where females are employed there shall be at least one latrine for every 25 females.

   b) Where males are employed, there shall be at least one latrine for every 25 males.

Provided that where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females, as the case may be, up to the first 100, and one for every 50 thereafter.

6.2 Every latrine shall be under cover and so partitioned off as to secure privacy, and shall has a proper door and fastenings.

6.3 Construction of Latrines: The inside walls shall be constructed of masonry or some suitable heat resisting non-absorbent materials and shall be cement washed inside and outside at least once a year. Latrine shall not be a standard lower than borehole system.

6.4 (a) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers “For Men only” or “For Women only” as the case may be.

   (b) The notice shall also bear the figure of man or of a women, as the case may be.
6.5 There shall be at least one urinal for male workers up to 50 and one for female workers up to 50 employed at a time. Provided that where the number of male or female workmen, as the case may be, exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females up to the first 500 and one for every 100 or part thereof, thereafter.

6.6 a) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.

b) Latrines and urinals other than those connected with a flush sewerage system shall comply with the requirements of the Public Health Authorities.

6.7 Water shall be provided by means of a tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

6.8 DISPOSAL OF EXCRETA

Unless otherwise arranged for by the local sanitary authority arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator. Alternatively excreta may be disposed off by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose and covering it with a 15 cm layer of waste or for refuse and then covering it with a layer of earth for fortnight (when it will turn into manure).

6.9 The Contractor shall, at his own expense, carry out all instruction issued to him by the Engineer-In-Charge to effect proper disposal of night soil and other conservancy work in respect of the Contractor’s workmen or employees on the Site. The Contractor shall be responsible for payment of any charges, which may be levied by Municipal or Cantonment Authority for execution of such work on his behalf.

7.0 PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost four suitable sheds, two for males and the other two for rest separately for the use of man and women labour. The height of each shelter shall not be less than 3 meters from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sqm. Per head.

Provided that the Engineer-In-Charges may permit, subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8.0 CRECHES

8.1 A every work place, at which 20 or more women workers are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a playroom for the children and the other as their bedrooms.

The rooms shall be constructed on standard not lower than the following:
8.2 The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.

8.3 The Contractor shall supply adequate number of toys and games in the playroom and sufficient number of cots and beddings in the bedroom.

8.4 The Contractor shall provide one Ayaa to look after the children in the creche when the number of women workers does not exceed 50 and two when the number of women workers exceed 50.

8.5 The use of the rooms/earmarked as ealize shall be restricted to children, their attendant and mother of the children.

9.0 CANTEENS

9.1 In every work place where the work regarding the employment of contract labour is likely to continue for six months and wherein contract labour numbering one hundred or more are ordinarily employed, an adequate canteen shall be provided by the Contractor for the use of such labour.

9.2 The canteen shall be maintained by the Contractor in an efficient manner.

9.3 The canteen shall consist of at least a dining hall, kitchen, storeroom, pantry and washing places separately for workers and utensils.

9.4 The canteen shall be sufficiently lighted at all times when any person has access to it.

9.5 The floor shall be made of smooth and impervious material and inside walls shall be lime washed or colour washed at least once in each year.

Provided that the inside walls of the kitchen shall be lime-washed every four months.

9.6 The premises of the canteen shall be maintained in a clean and sanitary condition.

9.7 Waste Water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.

9.8 Suitable arrangements shall be made for the collection and disposal of garbage.

9.9 The dinning hall shall accommodate at a time 30 persons of the labour working at time.
9.10 The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one square meter per dinner to be accommodated.

9.11 a) A portion of the dining hall, and service counter shall be partitioned off and reserved for women workers in proportion to their number.

b) Washing places for women shall be separate and screened to secure privacy.

9.12 Sufficient tables, stool, chairs or benches shall be available for the number of dinners to be accommodated.

9.13.1 a) There shall be provided and maintained sufficient utensils, crockery, furniture and any other equipment necessary for the efficient running of the canteen.

b) The furniture, utensils and other equipment shall be maintained in a clean and hygienic condition.

9.13.2 a) Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.

b) A service counter, if provided, shall have top of smooth and impervious material.

c) Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.

9.14 The foodstuffs and other items to be served in the canteen shall be in conformity with the normal habits of the labour.

9.15 The charge for foodstuffs, beverages and any other items served in the canteen shall be based on 'No profit No loss' and shall be conspicuously displayed in the canteen.

9.16 In arriving at price of foodstuffs, and other articles served in the canteen, the following items shall not be taken into consideration as expenditure, namely:

a) The rent of land building.

b) The depreciation and maintenance charges for the building and equipment provided for the canteen.

c) The cost of purchase, repair and replacement of equipment including furniture, crockery, cutlery and utensils:

d) The water charges and other charges incurred for lighting and ventilation:

e) The interest and amounts spent on the provision and maintenance and equipment provided for in the canteen.
9.17 The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10.0 ANTI MALARIAL PRECAUTIONS

The Contractor shall at his own expense, conform to all anti-malarial instructions given to him by the Engineer-In-Charge including the filling up of any borrow pits which may have been dug by him.

11.0 AMENDMENTS

EPI may from time to time, add to or amend these rules and issue such directions as it may consider necessary for the purpose of removing any difficulty which may arise in the administration hereof.
CONTRACTOR’S LABOUR REGULATIONS

1.0 SHORT TITLE

These regulations may be called the Contractor “Labour Regulations”.

2.0 DEFINITIONS

2.1 “Workman” means any person employed by EPI or its Contractor directly or indirectly through a sub-Contractor, with or without the knowledge, of EPI to do any skilled, semi-skilled, unskilled, manual, supervisory, technical or clerical work for hire or reward, whether, the terms of employment are expressed or implied but does not include any person-

a) Who is employed mainly in a managerial or administrative capacity; or

b) Who being employed in a supervisory capacity draws wages exceeding Rupees Two thousand Five hundred per person or exercises either by the nature of the duties attached to the office or by reason of powers vested to him, functions mainly of managerial nature.

c) Who is an out worker, that is to say, a person to whom any articles or materials are given out by or on behalf of the principal Employer to be made up cleaned, washed, altered, ornamental finished, repaired, adopted or otherwise processed for sale for the purpose of the trade or business of the principal Employer and the process is to be carried out either in the home of the out worker or in some other premises, not being premises under the control and management of the principal Employer.

2.2 “Fair Wages” means wages whether for time or piecework fixed and notified under the provisions of the minimum Wages Act from time to time.

2.3 “Contractor” shall include every person who undertake to produce a given result other than a mere supply of goods or articles of manufacture through labour or who supplies labour for any work and includes a sub-Contractor.

2.4 “Wages” shall have the same meaning as defined in the Payment of Wages Act.

2.4.1 Normally working hours of an adult employee should not exceed 9 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.

2.4.2 When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week he shall be paid overtime for the extra hours put in by him at double the ordinary rate of wages.
2.4.3.1 Every worker shall be given a weekly holiday on a Sunday, in accordance with the provisions of the Minimum Wages (Central) Rules 1960 as amended from time to time, irrespective of whether such worker is governed by the Minimum Wages Act or not.

2.4.3.2 Whether the Minimum Wages prescribed by the Government under the Minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker shall be entitled to rest day wages at the rate applicable to the next preceding day, provided he has worked under the same Contractor for a continuous period of not less than 6 days.

2.4.3.3 Where a Contractor is permitted by the Engineer-In-Charge to allow a worker to work on a normal weekly holiday, he shall grant a substitute holiday to him for the whole day on one of the five days immediately before or after the normal weekly holidays and pay wages to such worker for the work performed on the normal weekly holiday at overtime rate.

3.0 DISPLAY OF NOTICE REGARDING WAGES, ETC.

The Contractor shall before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain in a clean and legible condition in conspicuous places on the work, notices in English and in the local Indian languages spoken by the majority of the workers, giving the minimum rates of wages fixed under the Minimum Wages Act, the actual wages being paid, the hours of work for which such wages are earned, wage period, dates of payment of wages and other relevant information as per Appendix ‘A’.

4.0 PAYMENT OF WAGES

4.1 The Contractor shall fix wage periods in respect of which wages shall be payable.

4.2 No wage period shall exceed one month.

4.3 The wages of every person employed as labour in an establishment or by a Contractor where less than one thousand, such persons are employed shall be paid before the expiry of the seventh day and in other cases before the expiry of tenth day after the last day of the wage period in respect of which the wages are payable.

4.4 Where the employment of any worker is terminated by or on behalf of the Contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.

4.5 All payments of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.
4.6 Wages due to every worker shall be paid to him direct or to other person authorized by him in this behalf.

4.7 All wages shall be paid in current coin or currency or in both.

4.8 Wages shall be paid without any deductions of any kind except those specified by the Central Government by general or special order in this behalf or permissible under the Payment of Wages Act 1956.

4.9 A notice showing the wage period and the place and time of disbursement of wages shall be displayed at the place of work and a copy sent by the Contractor to the Engineer-In-Charge under acknowledgment.

4.10 It shall be the duty of the Contractor to ensure the disbursement of wages in the presence of the Engineer or any other authorized representatives of the Engineer-In-Charge who will be required to be present at the place and time of disbursement of wages by the Contractor to workmen.

4.11 The Contractor shall obtain from the Engineer or any other authorized representative of the Engineer-In-Charge as the case may be, a certificate under his signature at the end of the entries in the “Register of Wages” or the “Wage-cum-Muster Roll” as the case may be in the following form:

“Certified that the amount shown in column No.……….. has been paid to the workmen concerned in my presence on…………….. at …………….”

5.0 FINES AND DEDUCTIONS, WHICH MAY BE MADE FROM WAGES

5.1 The wages of a worker shall be paid to him without any deduction of any kind except the following:

a) Fines

b) Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.

c) Deduction for damage to or loss of goods expressly entrusted to the employed persons for custody, or from loss of money or any other deduction which he is required to account where such damage or loss is directly attributable to his neglect or default.

d) Deduction for recovery of advances or for adjustment of over payment of wages, advances granted shall be entered in a register.

e) Any other deduction, which the Central Government may from time to time allow.

5.2 No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved by the Chief Labour Commissioner.
NOTE: An approved list of Acts and Omissions for which fines can be imposed is enclosed at Appendix-I.

5.3 No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.

5.4 The total amount of fine which may be imposed in any one-wage period on a worker shall not exceed an amount equal to three paise in a Rupee of the total wages, payable to him in respect of that wage period.

5.5 No fine imposed on any worker shall be recovered from him in installment, or after the expiry of sixty days from the date on which it was imposed.

5.6 Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

6.0 LABOUR RECORDS

6.1 The Contractor shall maintain a “Register of persons employed” on work on contract in form XIII of the CL (R&A) Central Rules 1971 (Appendix-B).

6.2 The Contractor shall maintain a “Muster Roll” register in respect of all workmen employed by him on the work under contract in from XVI of the CL (R&A) Rules 1971 (Appendix-C).

6.3 The Contractor shall maintain a “Wage Register” in respect of all workmen employed by him on the work in form (Appendix-D).

6.4 Register of accidents – The Contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:

a) Full particulars of the labourers who met with accident.
b) Rate of wages
c) Sex
d) Age
e) Nature of accident and cause of accident.
f) Time and date of accident.
g) Date and time when he/she admitted in Hospital
h) Date of discharge from the Hospital
i) Period of treatment and result of treatment
j) Percentage of loss of earning capacity and disability as assessed by Medical Officer.
k) Claim required to be paid under Workmen’s Compensation Act.
l) Date of payment of compensation.
m) Amount paid with details of the person to whom the same was paid.
n) Authority by whom the compensation was assessed.
o) Remarks.
6.5 Register of Fines – The Contractor shall maintain a “Register of Fines” in the form (Appendix-H).

The Contractor shall display in a good condition and in a conspicuous place of work the approved list of Acts and Omission for which fines can be imposed (Appendix-I).

6.6 Register of Deductions-The Contractor shall maintain a “Register of Deductions” for damage or loss in form (Appendix-J).

6.7 Register of Advances-The Contractor shall maintain a “Register of Advances” in form (Appendix-K).

6.8 Register of Overtime-The Contractor shall maintain a “Register of Overtime” in form (Appendix-L).

7.0 ATTENDANCE CARD-CUM WAGE SLIP:

7.1 The Contractor shall issue an attendance card-cum-wage slip to each workman employed by him in the specimen form at (Appendix-E).

7.2 The card shall be valid for each wage period.

7.3 The Contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.

7.4 The card shall remain in possession of the worker during the wage period under reference.

7.5 The Contractor shall complete the wage slip portion on the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.

7.6 The Contractor shall obtain the signature or thump impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

8.0 EMPLOYMENT CARD

The Contractor shall issue an Employment Card in form to each worker within three days of the employment of the worker (Appendix-F).

9.0 SERVICE CERTIFICATE

On termination of employment for any reason whatsoever the Contractor shall issue to the workman whose services have been terminated, a service certificate in from Appendix-G.
10.0 PRESERVATION OF LABOUR RECORDS

All records required to be maintained under Regulations Nos. 6 and 7 shall be preserved in original for a period of three years from the date of last entries made in them and shall be made available for inspection by the Engineer-In-Charge, Labour Officer.

11.0 POWER OF LABOUR OFFICERS TO MAKE INVESTIGATIONS INQUIRY

The Labour Officer or any other person authorized by EPI on its behalf shall have power to make inquiries with a view to ascertaining and enforcing due and proper observance of the Fair Wage Clauses and the Provisions of Regulations. He shall investigate into any complaint regarding the default made by the Contractor or sub-Contractor in regard to such provision.

12.0 INSPECTION OF BOOK AND SLIPS

The Contractor shall allow inspection of all the prescribed labour records to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour officer or any other person, authorized by the Central Government on his behalf.

13.0 SUBMISSION OF RETURNS

The Contractor shall submit periodical returns as may be specified from time to time.

14.0 AMENDMENTS

EPI may from to time, add or amend the regulations and on any question as to the application, interpretation or effect of these regulations the decision of the Zonal Chief concerned shall be final.
Appendix – ‘A’

LABOUR BOARD

Name of work
Name of Contractor
Address of Contractor
Name and Address of Unit
Name of Labour Enforcement Officer
Address of Labour Enforcement Officer
Date:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Category</th>
<th>Minimum wage fixed</th>
<th>Actual wages paid</th>
<th>Number present</th>
<th>Remarks</th>
</tr>
</thead>
</table>

Weekly Holiday
Wage Period
Date of Payment of wages
Working hours
Rest interval
FORM 13

SEE RULE 75

REGISTER OF WORKMEN EMPLOYED BY CONTRACTOR

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name and surname of workman</th>
<th>Age &amp; sex</th>
<th>Father’s Husbands Name</th>
<th>Nature of employment / designation</th>
<th>Permanent home address of the workman (village and Tehsil Taluk and District)</th>
<th>Local address</th>
<th>Date of commencement of employment</th>
<th>Signature or thumb impression of the workman</th>
<th>Date of termination of employment</th>
<th>Reasons for termination</th>
<th>Remarks</th>
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FORM XVI

(See Rule 78(2) (193)

MUSTER ROLL

Name and address of Contractor

Name and address of establishment in/under which contract is carried on

Nature and location of work

Name and Address of Principal Employer

For the month / fortnight

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the workman</th>
<th>Sex</th>
<th>Father's / Husband's Name</th>
<th>Dates</th>
<th>Remarks</th>
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</table>

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FORM XVII

[SEE RULE 78(2) (03)]

REGISTER OF WAGES

Name and address of Contractor

Name and address of establishment in/under which contract is carried on

Nature and location of work

Name and Address of Principal Employer

Wage period: per month/ fortnightly

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Workman</th>
<th>Serial No. in the register of workman</th>
<th>Designation nature of work done</th>
<th>Nos. of days worked</th>
<th>Units of work done</th>
<th>Daily rate of wages/ piece rate</th>
<th>Basic Wages</th>
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</table>

Dearness allowance  Overtime  Other cash payments (Nature of payments to be indicated)  Total  Duration if any (indicate)  Net Amt paid  Signature thumb impression of the workman  Initial Contractor or his representative

<table>
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<tr>
<th>9</th>
<th>10</th>
<th>11</th>
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</table>

Signature of Contractor
FORM XIX

[SEE RULE 78 (2) (B)]

WAGESLIP

Name and address of Contractor

Name and Father’s/Husband’s Name of workman

Nature and location of work

For the Week/Fortnight/Month ending

1. No. of days worked

2. No. of Units worked in case of piece rate workers

3. Rate of daily wages/piece rate

4. Amount of overtime wages

5. Gross wages payable

6. Deductions if any

7. Net amount of wages paid

Sign of the Contractor
## WAGE CARD

<table>
<thead>
<tr>
<th>WAGE CARD NO.</th>
<th>NAME AND ADDRESS OF CONTRACTOR</th>
<th>DATE OF ISSUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NATURE OF WORK WITH LOCATION</td>
<td>DESIGNATION</td>
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<tr>
<td></td>
<td>NAME OF WORKMAN</td>
<td>MONTH/FORTNIGHT</td>
</tr>
<tr>
<td>RATE OF WAGES</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</td>
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<td>MORNING</td>
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<td>AMOUNT</td>
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<td>INITIAL</td>
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<td>RECEIVED FROM</td>
<td>THE SUM OF RS.</td>
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</table>

**SIGNATURE**

THE WAGE CARD IS VALID FOR ONE MONTH FROM THE DATE OF ISSUE.
FORM XIV

(SEE RULE 76)

EMPLOYMENT CARD

Name and address of Contractor

Name and address of establishment under which

The contract is carried out

Nature and location of work

Name and address of Principal Employer

1. Name of the workman
2. S. Name in the register of workman employed
3. Nature of Employment/Designation
4. Wage rate (with particulars of unit in case of piece work)
5. Wage Period
6. Tenure of employment
7. Remarks

Signature of Contractor
## SERVICE CERTIFICATE

- Name and address of Contractor
- Nature and location of work
- Name and address of workman
- Age or date of birth
- Identification Marks
- Father’s/Husband’s Name
- Name and address of establishment in which contract is carried on
- Name and address of Principal Employer
- Total period of which employed

<table>
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<tr>
<th>S.No.</th>
<th>From</th>
<th>To</th>
<th>Nature of work</th>
<th>Rate of wages (with particular s of unit In case of piece work)</th>
<th>Remarks</th>
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</tbody>
</table>

Signature
**FORM XII**

[SEE RULE 78 (2) (D)]

**REGISTER OF FINES**

Name and address of Contractor

Name and address of establishment in/ under which contract is carried on

Nature and location of work

Name and address of workman

Name and address of Principal Employer

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of workman</th>
<th>Father’s/Husband Name</th>
<th>Designation/nature of employment</th>
<th>Act/Omission for which fine imposed</th>
<th>Date of offence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Whether workman showed causes against fine</th>
<th>Name of person in whose presence employees explanation was heard</th>
<th>Wage period and wages payable</th>
<th>Amount of fine Imposed</th>
<th>Date on which fine realized</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>8</td>
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<td>10</td>
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<td>12</td>
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</tbody>
</table>
LIST OF ACTS AND OMISSIONS FOR WHICH FINES CAN BE IMPOSED

In accordance with rule of Labour Regulations, to be displayed prominently at the Site of work both in English and local language.

1. Willful insubordination or disobedience, whether alone or in combination with other.
2. Theft, fraud or dishonestly in connection with Contractors beside a business or property of EPI.
3. Taking or giving bribes or any illegal gratifications.
4. Habitual late attendance.
5. Drunk-ness fighting riotous or disorderly or indifferent behaviour.
6. Habitual negligence.
7. Smoking near or around the area where combustible or other materials are locked.
8. Habitual indiscipline.
9. Causing damage to work in the progress or to property of EPI or of the Contractor.
10. Sleeping on duty.
11. Malingering or slowing down work.
12. Giving the false information regarding name, age, fathers name etc.
13. Habitual loss of wage cards supplied by the Employer.
14. Unauthorized use of Employers property or manufacturing or making of unauthorized articles at the work place.
15. Bad workmanship in construction and maintenance by skilled workers, which is not approved by EPI for which the Contractors are compelled to undertake rectifications.
16. Making false complaints and/or misleading statements.
17. Engaging on trade within the premises of the establishment.
18. Any unauthorized divulgence of business affairs of the employees.
19. Collection or canvassing for the collection of any money within the premises of an establishment unless authorized by the Employer.
20. Holding meeting inside the premises without previous sanction of the Employers.
21. Threatening or intimidating any workman or employee during the working hours within the premises.
# FORM XX

[SEE RULE 78 (2) (D)]

## REGISTER OF DEDUCTION FOR DAMAGES OR LOSS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of workman</th>
<th>Father’s/Husband Name</th>
<th>Designation/nature of employment</th>
<th>Particulars of damage or loss</th>
<th>Date of damage/loss</th>
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</table>

<table>
<thead>
<tr>
<th>Date of recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

- **Whether workman showed cause against deductions**
- **Date of recovery**
- **Remarks**

**Signature of Contractor**

**Page 93**

**EPI**
Appendix – ‘K’

FORM XXII

[SEE RULE 78(2)]

REGISTER OF ADVANCES

Name and address of Contractor

Name and address of establishment in/ under which contract is carried on

Nature and location of work

Name and address of Principal Employer

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of workman</th>
<th>Father’s/Husband Name</th>
<th>Designation/nature of employment</th>
<th>Wages period and wages payable</th>
<th>Date and amount of advance given</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Purpose / for which advance made

No. of installments by which advance is to be paid

Date and amount of each installment repaid

Date on which last installment was repaid

Remarks

<table>
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<tr>
<th>7</th>
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<th>11</th>
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</tbody>
</table>
**FORM XXIII**

[See Rule 78(2) (E)]

**REGISTER OF OVERTIME**

Name and address of Contractor

Name and address of establishment in/ under which contract is carried on

Nature and location of work

Name and address of Principal Employer

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of workman</th>
<th>Father’s/Husband Name</th>
<th>Sex</th>
<th>Designation/ nature of employment</th>
<th>Date on which overtime worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total overtime worked or production in case of piece rated</th>
<th>Normal rate of wages</th>
<th>Overtime rate of wages</th>
<th>Overtime earning</th>
<th>Rate on which overtime wages paid</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
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<td>12</td>
</tr>
</tbody>
</table>
APLICATION FOR EXTENSION OF TIME

(To be completed by the Contractor)

PART –I

1. Name of Contractor
2. Name of the work as given in the Agreement
3. Agreement No.
4. Estimated amount put to Tender
5. Date of commencement work as per agreement
6. Period allowed for completion of work as per agreement
7. Date of completion stipulated as per agreement
8. Period for which extension of time has been given previously
   Extension granted
   a) First extension vide Engineer-in-charge letter No… ……date Months Days
   b) 2nd extension vide Engineer-in-charge letter No………. date Months Days
   c) 3rd extension vide Engineer-in-charge letter No………. date Months Days
   d) 4th extension vide engineer-in-charge letter No………. date Months Days

Total extension previously given

9. Reasons for which extension have been previously given (copies of the previous application should be attached)

10. Period for which extension is applied for:

11. Hindrances on account of which extension is applied for with dates on which hindrances occurred, and the period for which these are likely to last.
   a) Serial No.
   b) Nature of hindrance
c) Date of Occurrence

d) Period for which it is likely to last

e) Period for which extension required for this particular hindrance.

f) Overlapping period, if any, with reference to item
g) Net extension applied for

h) Remarks, if any

Total period for which extension is now applied for on account of hindrances mentioned above …………. Month/ days.

12. Extension of time required for extra work.

13. Details of extra work and on the amount involved:

   a) Total value of extra work
   b) Proportionate period of extension of time based on estimated amount put to tender on account of extra work.

14. Total extension of time required for 11 & 12

Submitted to the Engineer-In-Charges office.

SIGNATURE OF CONTRACTOR

DATE
APPLICATION FOR EXTENSION OF TIME

(PART – II)

1. Date of receipt of application from Contractor for the work in the Engineer-In-Charge office.

2. Acknowledgement issued by Engineer-In-Charge vide his letter No dated

3. Engineer-In-Charge remarks regarding hindrances mentioned by the Contractor.
   i) Serial No.
   ii) Nature of hindrance
   iii) Date of occurrence of hindrance
   iv) Period for which hindrance, is likely to last
   v) Extension of time period applied for by the Contractor
   vi) Overlapping period, if any, giving reference to items which overlap
   vii) Net period for which extension is recommended.
   viii) Remarks as to why the hindrance occurred and justification for extension recommended.

4. Engineer-In-Charge recommendations.
   (The present progress of the work should be stated and whether the work is likely to be completed by the date upto which extension has been applied for. If extension of time is not recommended, what compensation is proposed to be levied under the agreement.

SIGNATURE OF ENGINEER-IN-CHARGE

APPROVAL OF ZONAL HEAD
PROFORMA FOR EXTENSION OF TIME

PART –III

To

NAME

ADDRESS OF THE CONTRACTOR

SUBJECT:

Dear Sir(s)

Reference your letter No __________ dated __________, in connection with the grant of extension of time for completion of the work…..

The date of completion for the above mentioned work, is __________ as stipulated in the agreement, dated __________.

Extension of time for completion of the above mentioned work is granted upto __________, without prejudice to the right of EPI to recover compensation for delay in accordance with the provision made in the relevant Clause(s) of the said agreement dated the ___/___/_____. It is also clearly understood that EPI shall not consider any revision in contract price or any other compensation whatsoever due to grant of this extension.

Provided that notwithstanding the extension hereby granted, time is and shall still continue to be the essence of the said agreement.

Yours faithfully,

FOR EPI LTD.
PROFORMA FOR BANK GURANTEE IN LIEU OF EARNEST MONEY DEPOSIT

In consideration of Chairman & managing Director, Engineering Projects (India) Limited, (A Govt. of India Enterprise), Core-3, Scope Complex, Lodhi Road, New Delhi Pin-110003. (hereinafter called the EPI) having agreed to accept bank Guarantee of Rs .................... in lieu of EARNEST MONEY DEPOSIT from ........................................................................... (hereinafter called the Supplier/ Contractor/ Sub-Contractor, which expression shall include its heirs, successors and assignees) in respect of the Tender for ................................................................................................................

We, ........................................ bank having its registered/head office at .................................. (hereinafter referred to as the Bank) do hereby agree and undertake to pay to EPI without demur or protest an amount not exceeding Rs....................... on demand by EPI.

We the above said Bank further agree and undertake to pay the said amount of Rs....................... without any demur on demand within 48 hours. Any demand made on the Bank by EPI shall be conclusive as regards the amount due and payable by the Bank under this guarantee.

We the above said Bank further agree that the guarantee herein contained shall be in full force and in effect until ............................................................... date ..............................

Unless a demand or claim under this guarantee is made on us in writing on or before ............................................. date ............................... , we shall be discharged from all liabilities under this guarantee thereafter.

We, the above said Bank, further agree that EPI shall have full liberty, without our consent and without affecting in any manner our obligation to verify, modify or delete any of the conditions.

We, the above said Bank, lastly undertake not to revoke this guarantee during its currency except with the prior consent of EPI in writing.

Dated………………………..this day of……………..200.

For and on behalf of the Bank

NOTE: on a Non-Judicial stamp paper of Rs. 100/- (Rupees One hundred only)
SECURITY DEPOSIT CUM PERFORMANCE BANK GUARANTEE

The Chairman & Managing Director
(A Govt. of India Enterprise),
Engineering Projects (India) Ltd.
Core-3, SCOPE Complex
7, Institutional Area, Lodhi road
New Delhi – 110 003

Dear Sir,

In consideration of the Chairman & Managing Director, Engineering Projects (India) Ltd. (A Govt. of India Enterprise), Core-3, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi – 110 003 (hereinafter called ‘EPI’ which expression shall unless repugnant to the subject or context includes its successors and assigns) having agreed under the terms and conditions of Supply Contract/Contract/Sub-Contract no._____________________________________, Dated______________________, made between M/s ___________________________, (hereinafter referred to as the said Supplier/Contractor/Sub-Contractor) which expression shall unless repugnant to the subject or context includes its successors and assigns) and EPI in connection with ____________________________, (hereinafter called ‘The said Supply Contract/Contract/Sub-Contract) to accept a Deed Security Deposit-cum-Performance Bank Guarantee as herein provided for ___________________________ in lieu of:

a) The Security Deposit to be made by the said Supplier/Contractor/Sub-Contractor for the due fulfillment by the said Supplier/Contractor/Sub-Contractor of the terms and conditions contained in the said Supply Contract/Contract/Sub-contract, and

b) Fulfillment of the conditions of the said Supply Contract /Contract/Sub-Contract by furnishing a security for the performance of the works and/or equipment/materials supplied in accordance with conditions of the said Supply Contract/ Contract/ Sub-Contract.

1. We ___________________________ (hereinafter referred to as “the said bank which expression shall unless repugnant to the subject or context includes its successors and assigns) and having our registered office at ___________________________ do hereby unconditionally and irrevocably undertake and agree to indemnify and keep indemnified EPI from time to time to the extent of ___________________________ Only against any loss, damages, costs, charges and expenses caused to or suffered by or that may be caused or suffered by EPI [I by reason of any breach or breaches by the said Supplier/Contractor/Sub-Contractor of any of the terms and conditions contained in the said Supply Contract/Contract/Sub-Contract and or any amount becoming due for non-
performance and/or penalty as assessed by EPI and top unconditionally pay the amount claimed by EPI on demand and without demur and protest.

2. We the said 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 Supply Contract/Contract/Sub-Contract and till all the dues of EPI under the said Supply Contract/Contract/Sub-Contract or by virtue of any of the terms and conditions governing the said Supply Contract/Contract/Sub-Contract have been fully paid and its claims satisfied or discharged and till EPI certifies that the terms and conditions of the said Supply Contract/Contract/Sub-Contract have been fully and properly carried out by the said Supplier/Contractor/Sub-Contractor and accordingly discharge this guarantee subject, however, that EPI shall have no claim under this guarantee after 6 months from the date of expiry of the guarantee unless a notice of the claim under this guarantee has been served on the Bank before the expiry of the said period of 6 months.

3. EPI shall have the fullest liberty without affecting in any way the liability of the said Bank under this Guarantee or indemnity from time to time to vary any of the terms and conditions of the said Supply Contract/Contract/Sub-Contract to extend time of performance of the said Supply Contract/Contract/Sub-Contract or to postpone for any time and from time to time any power’s exercisable by it against the said Supplier/Contractor/Sub-Contractor and either to enforce or forbear from enforcing any of the terms and conditions governing the said Supply Contract/Contract/Sub-Contract or securities available to EPI and the said Bank shall not be released from its liability under these presents by any exercise by EPI of the liberty with reference to the matters aforesaid or by reason of time being given to the said Supplier/Contractor/Sub-Contractor or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of so releasing the said Bank from its such liability.

4. We, the said Bank, further agree that EPI shall be the sole judge of and as to whether the said Supplier/Contractor/Sub-Contractor has committed any breach or breaches of any of the terms and conditions of the said Supply Contract/Contract/Sub-Contract and the extent of loss, damage, cost, charges and expenses caused to or suffered by or that may be caused to or suffered by EPI on account thereof and the decision of EPI that the said Supplier/Contractor/Sub-Contractor has committed such breach or breaches and as to the amount or amounts of loss, damages, costs, charges and expenses caused to or suffered by EPI from time to time shall be final and binding on the Bank.

5. This guarantee shall be a continuing guarantee and shall remain valid and irrevocable for all claims of EPI and liabilities of the said Supplier/Contractor/Sub-Contractor arising up to and until mid night of ________________________, subject the claim period as mentioned in para ______________.

6. This guarantee shall be in addition to any other guarantee or security whatsoever that EPI may now or at any time anywise may have in relation to the said Supplier/Contractor/Sub-Contractor obligation/liabilities under and/or in connection with the said Supply Contract/Contract/Sub-Contract and EPI shall have full authority to take recourse to or enforce this guarantee in preference to any other guarantee or
security which EPI may have or obtain and there shall be no forbearance on the part of EPI IN ENFORCING OR REQUIRING ENFORCEMENT OF ANY OTHER SECURITY AND shall not have the effect of releasing the said Bank from its full liability hereunder:

7. EPI shall be at liberty without reference to the said Bank and without effecting the full liability of the said Bank hereunder to take any other security in respect of the said supplier's/Contractor's/sub-Contractor's obligations and/or liabilities under or in connection with the said Supply Contract/Contract/Sub-Contract.

8. This guarantee shall not be determined or affected by the liquidation or winding up, dissolution, or change of constitution or insolvency of the said Supplier/Contractor/Sub-Contractor, but shall in all respects and for all purposes be binding and operative until payment of all moneys paid to EPI in terms thereof.

9. The said Bank hereby waives all rights at any time inconsistent with the terms of this guarantee and the obligations of the said Bank in terms hereof shall not be anywise affected or suspended by reasons of any dispute or disputes having been raised by the said Supplier/Contractor/Sub-Contractor (whether or not pending before any arbitrator, tribunal or court) of any denial or liability by the said Supplier/Contractor/Sub-Contractor stopping or preventing or purporting to stop or prevent any payment by the said Bank to EPI in terms hereof. The amount stated in any notice of demand addressed by EPI to the Guarantor Bank as liable to be paid to EPI by the Supplier/Contractor/Sub-Contractor on account of any losses or damages or costs, charges and/or expenses shall as between the said bank and EPI be conclusive evidence of the amount so liable to be paid to EPI or suffered or incurred by EPI as the case may be and payable by the said Bank to EPI in terms hereof. We, the said Bank further undertake that we shall pay forthwith the amount stated in the notice of demand to EPI without demur and protest.

10. We, the said bank undertake not to revoke this guarantee during its currency except with the consent of EPI in writing and agree that any change in the constitution of the said Supplier/Contractor/Sub-Contractor or the said Bank shall not discharge our liabilities hereunder.

11. It shall not be necessary for EPI to proceed against the said Supplier/Contractor/Sub-Contractor before proceeding against the Bank and the guarantee herein contained shall be enforceable against the Bank notwithstanding any security which EPI may have obtained or obtain from the Supplier/Contractor/Sub-Contractor shall at the time when proceedings are taken against the said Bank hereunder be outstanding or unrealized.

12. Our liability under this guarantee shall be restricted to ________________ and this guarantee shall remain in force until midnight of ________________ unless a claim to enforce this guarantee is filed with us within six months from ________________. (which is date of expiry of this guarantee), we shall be discharged from all liabilities under this guarantee thereafter.

DATED ---------------------------- THIS day of -----------------------200...

FOR AND ON BEHALF OF BANK
PROFORMA FOR ADVANCE BANK GUARANTEE

To

The Chairman & Managing Director,
Engineering Projects (India) Ltd.,
(A Govt. of India Enterprise),
Core-3, Scope Complex,
7, Institutional Area,
Lodhi Road,
New Delhi—110 003.

Dear Sir,

1. In consideration of the Chairman & Managing Director, Engineering Projects (India) Limited, (A Govt. of India Enterprise), Core-3, Scope Complex, 7, Institutional Area, Lodhi Road, New Delhi – 110 003 (hereinafter called ‘EPI’ which expression shall includes its successors and assignees) having agreed under the terms and conditions of Supply Contract/ Contract/ Sub-Contract No……………………………dated…………(hereinafter referred to as the said Supply Contract/ Contract/ Sub-Contract) made between EPI and……………………………hereinafter called the Supplier/ Contractor/ Sub-Contractor) which expression shall include its successors and assigns to make at the request of the Supplier/ Contractor/ Sub-Contractor a lump sum advance of Rs……………..for utilising it only for the purposes of the said Supply Contract/ Contract/ Sub-Contract on his furnishing a guarantee acceptable to EPI.

2. We, the…………………………….Bank (hereinafter referred to as ‘the said Bank) a Company under the Companies Act 1956 and having our registered office at……………………………….do hereby guarantee the recovery of the said advance and interest thereon as provided according to the terms and conditions of the said Supply Contract/ Contract/ Sub-Contract. If the Supplier/ Contractor/ Sub-Contractor fails to utilise the said advance for the purposes of the said Supply Contract/ Contract/ Sub-Contract and/or the said advance together with interest thereon as aforesaid is not fully recovered by EPI, we. ………….Bank hereby unconditionally and irrevocably undertake to pay the EPI on demand and without demur or protest to the extent of the said sum of Rs……………..any claim made by EPI on us against non-utilisation / misutilisation of the said advance and/or by reason of EPI not being able to recover in full the sum of Rs……………..with interest as aforesaid.

3. We………………………………Bank further agree that EPI shall be the sole judge of and as to whether the said Supplier/ Contractor/ Sub-Contractor has utilised or not utilised the said advance or any part thereof for the purposes of the said Supply Contract/ Contract/ Sub-Contract and/or as to whether the advance or any part thereof with
interest has been recovered or not and the finding of the EPI in this regard shall be final and binding on us.

4. We, the said 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 Supply Contract/ Contract/ Sub-Contract and till the said advance with interest has been fully recovered and its claims satisfied or discharged and till EPI certifies that the said advance with interest has been fully recovered from the Supplier/ Contractor/ Sub-Contractor.

5. EPI shall have the fullest liberty without affecting in any way the liability to the said Bank under this guarantee or indemnity from time to time to vary any of the terms and conditions of the said Supply Contract/ Contract/ Sub-Contract, or the advance or to extend time of performance by the said Supplier/ Contractor/ Sub-Contractor or to postpone for any time and from time to time any powers exercisable by it against the said Supplier/ Contractor/ Sub-Contractor and either to enforce or forbear from enforcing any of the terms and conditions governing the said Supply Contract/ Contract/ Sub-Contract or securities available to EPI and the said Bank shall not be released from its liability under these presents by any exercise by EPI of the liberty with reference to the matters aforesaid or by reason of time being given to the said Supplier/ Contractor/ Sub-Contractor or any other forbearance, act or omission on the part of the EPI or any indulgence by EPI to the said Supplier/ Contractor/ Sub-Contractor or of any other matter or thing whatsoever which under the law relating to sureties would but for this provision have the effect of so releasing the said Bank from its such liability.

6. The Bank hereby waives all rights at any time inconsistent with the terms of this guarantee/Undertaking and the obligations of the Bank in terms hereof shall not be anywise affected or suspended by reasons of any dispute or disputes having been raised by the Supplier/ Contractor/ Sub-Contractor (whether or not pending before any arbitrator, Tribunal or court) or any denial or liability by the Supplier/ Contractor/ Sub-Contractor stopping or preventing or purporting to stop or prevent any payment by the Bank to EPI in terms hereof.

7. The amount stated in any notice of demand addressed by EPI to Bank as liable to be paid to EPI by the Supplier/ Contractor/ Sub-Contractor, shall be conclusive evidence of the amount so liable to be paid to EPI by the Bank.

8. This guarantee/undertaking shall be in addition to any other guarantee or security whatsoever that EPI may now or any time anywise may have in relation to the Supplier’s/ Contractor’s/ Sub-Contractor’s obligations of liabilities under and/or in connection with the said Supply Contract/ Contract/ Sub-Contract, and EPI shall have full authority to take recourse to or enforce this security in preference to any other guarantee or security which EPI may have or obtain and there shall be no forbearance on the part of EPI in enforcing or requiring enforcement of any other security and shall not have the effect of releasing the Bank from its full liability hereunder.

9. It shall not be necessary for EPI to proceed against the said Supplier/ Contractor/ Sub-Contractor before proceeding against the Bank and the guarantee herein contained shall be enforceable against the Bank notwithstanding any security which EPI may have obtained or obtain from the Supplier/ Contractor/ Sub-Contractor, shall at the time
when proceedings are taken against the said Bank hereunder be outstanding or unrealised.

10. We, ..................................... the said Bank further undertake that we shall pay forthwith the amount stated in the notice of demand without demur and protest notwithstanding any dispute/difference pending between the parties before the arbitrator Tribunal or Court and/or dispute is being referred to arbitrator.

11. We, the said Bank undertake not to revoke this Guarantee during its currency except with the consent of EPI in writing and agree that any change in the Constitution of the said Supplier/ Contractor/ Sub-Contractor or the said Bank shall not discharge our liability hereunder.

12. This guarantee/undertaking shall be a continuing guarantee/undertaking and shall remain valid and irrevocable for all claims of EPI and liabilities of the Supplier/ Contractor/ Sub-Contractor arising up to and until midnight of………

13. Notwithstanding anything contained herein above, our liability under this guarantee shall be restricted to Rs………………. (Rs……………………………….) and this guarantee shall remain in full force till……………. unless a claim is made on us within 3 months from the date of expiry of this guarantee i.e. before all the claims under this guarantee shall be forfeited and we shall be relieved of and discharged from our liabilities hereunder.

Dated.........................................................day of......................................... 200

For and on behalf of Bank
PROFORMA FOR PERFORMANCE BANK GUARANTEE

To

The Chairman & Managing Director,
Engineering Projects (India) Ltd.,
(A Govt. of India Enterprise),
Core-3, Scope Complex,
7, Institutional Area,
Lodhi Road,
New Delhi—110 003.

Dear Sir,

In consideration of the Chairman & Managing Director, Engineering Projects (India) Limited, (A Govt. of India Enterprise), Core-3, Scope Complex, 7, Institutional Area, Lodhi Road, New Delhi – 110 003 (hereinafter called ‘EPI’ which expression shall include its successors and assigns) having awarded to ……………… (hereinafter referred to as ‘the Supplier/ Contractor/ Sub-Contractor’ which expression shall wherever the subject or context so permits include its successors and assigns) a Supply Contract/Contract / Sub-Contract No. ……………… in terms inter alia, of EPI Letter No. ………………dated… and the General Conditions of Contract/ General Purchase Conditions of EPI and upon the condition of the Supplier’s/ Contractor’s/ Sub-Contractor’s furnishing security for the performance of the Supplier’s/ Contractor’s/ Sub-Contractor’s obligations and/or discharge of the Supplier’s/ Contractor’s/ Sub-Contractor’s liability under and/or in connection with the said Supply Contract/ Contract/ Sub-Contract up to a sum of Rs………….(Rupees…………………………. only) amount to………..percent of the total Supply Contract/ Contract/ Sub-Contract Value.

1. We………………………………………………………………………………………….(hereinafter called ‘the Bank’ which expression shall include its successors and assigns) hereby jointly and severally undertake the guarantee to payment to EPI in rupees forthwith on demand in writing and without protest or demur or any and all monies anywise payable by the Supplier/ Contractor/ Sub-Contractor to EPI under in respect of or in connection with the said Supply Contract/ Contract/ Sub-Contract inclusive of all EPI’s losses and damages and costs, charges and expenses and other moneys anywise payable in respect to the above as specified in any notice of demand made by the EPI to the Bank with reference to this guarantee up to and aggregate limit of Rs……………….(Rupees…………………………………………………..only).
2. We further agree that EPI shall be sole judge of and as to whether the said Supplier/ Contractor/ Sub-Contractor has committed any breach or breaches of any of the terms and conditions of the said Supply Contract/ Contract/ Sub-Contract and the extent of loss, damage, cost, charges and expenses caused to or suffered by or that may be caused to or suffered by EPI on account thereof and the decision of EPI that the said Supplier/ Contractor/ Sub-Contractor has committed such breach or breaches and as to the amount or amounts of loss, damage, costs, charges and expenses caused to or suffered by EPI from time to time shall be final and binding on us.

3. EPI shall be at liberty without reference to the Bank and without effecting the full liability of the Bank hereunder to take any other security in respect of the Supplier's/ Contractor's/ Sub-Contractor's obligations and/or liabilities under or in connection with the said Supply Contract/ Contract/ Sub-Contract and to vary the forms vis-à-vis the Supplier/ Contractor/ Sub-Contractor of the said Supply Contract/ Contract/ Sub-Contract or to grant time and/or indulgence to the Supplier/ Contractor/ Sub-Contractor or to reduce or to increase or otherwise vary the prices of the total Supply Contract/ Contract/ Sub-Contract Value or to release or to forbear from enforcement of all or any of the security and/or any other security(ies) now or hereafter held by the EPI and no such dealing(s) reduction(s) increase(s) or other indulgence(s) or arrangement(s) with the Supplier/ Contractor/ Sub-Contractor or release or forbearance whatsoever shall absolve the bank of the full liability to EPI hereunder or prejudice rights of EPI against the bank.

4. The guarantee/undertaking shall not be determined or affected by the liquidation or winding up, dissolution, or change of constitution or insolvency of the Supplier/ Contractor/ Sub-Contractor but shall in all respects and for all purposes be binding and operative until payment of all moneys made to EPI in terms thereof.

5. The Bank hereby waives all rights at any time inconsistent with the terms of this guarantee/undertaking and the obligations of the Bank in terms hereof shall not be anywise affected or suspended by reasons of any dispute or disputes having been raised by the Supplier/ Contractor/ Sub-Contractor (whether or not pending before any arbitrator, Tribunal or Court) of any denial or liability by the Supplier/ Contractor/ Sub-Contractor stopping or preventing or purporting to stop or prevent any payment by the Bank to the EPI in terms hereof.

6. The amount stated in any notice of demand addressed by EPI to Bank as liable to be paid to EPI by the Supplier/ Contractor/ Sub-Contractor or as suffered or incurred by the EPI on account of any losses or damages or costs, charges and/or expenses shall be conclusive evidence of the amount so liable to be paid to EPI or suffered or incurred by EPI as the case may be and shall be payable by the Bank to EPI in terms hereof.
7. This guarantee/undertaking shall be a continuing guarantee/undertaking and shall remain valid and irrevocable for all claims of EPI and liabilities of the Supplier/ Contractor/ Sub-Contractor arising up to and until midnight of……………….

8. This guarantee/undertaking shall be in addition to any other guarantee or security whatsoever that EPI may now or any time anywise may have in relation to the Supplier’s/ Contractor’s/ Sub-Contractor’s obligations of liabilities under and/or in connection with the said Supply Contract/ Contract/ Sub-Contract, and EPI shall have full authority to take recourse to or enforce this security in preference to any other guarantee of security which EPI may have or obtain and here shall be no forbearance on the part of EPI in enforcing or requiring enforcement of any other security and shall not have the effect of releasing the Bank from its full liability hereunder.

9. It shall not be necessary for EPI to proceed against the said Supplier/ Contractor/ Sub-Contractor before proceeding against the Bank and the guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the EPI may have obtained or obtain from the Supplier/ Contractor/ Sub-Contractor, shall at the time when proceedings are taken against the said Bank hereunder be outstanding or unrealised.

10. We the said Bank undertake not to revoke this guarantee during its currency except with the consent of EPI in writing and agree that any change in the constitution of the said Supplier/ Contractor/ Sub-Contractor or the said bank shall not discharge our liability hereunder.

11. We ………….the said Bank further undertake that we shall pay forthwith the amount stated in the notice of demand without demur and protest notwithstanding any dispute/difference pending between the parties before the arbitrator Tribunal or Court and/or any dispute is being referred to arbitrator.

12. Notwithstanding anything contained herein above, our liability under this guarantee shall be restricted to Rs………………….. (Rupees……………………………….) and this guarantee shall remain in force till……………… unless a claim is made on us within 3 months from that date, that is before all the claims under this guarantee shall be forfeited and we shall be relieved of and discharged from our liabilities thereunder.

Dated……………………………………. day of…………………………………………….. 200

For and on behalf of Bank
PROFORMA FOR INDEMNITY BOND TO BE EXECUTED BY
THE CONTRACTOR FOR SECURED ADVANCE
AGAINST MATERIALS SUPPLIED FOR THE PROJECT
(On non-judicial stamp paper of appropriate value)

INDEMNITY BOND

THIS INDEMNITY BOND is made this ........................................ day of.......................... 20........ by................................... (Contractor’s Name) a Company registered under the Companies Act, 1956/Partnership firm/Proprietary concern having its Registered Office at .................... (hereinafter called as ‘Contractor’ which expression shall include its successors and permitted assigns) in favour of Engineering Projects (India) Limited, a Company incorporated under the Companies Act, 1956 having its Registered Office at Core-3, Scope Complex, 7, Institutional Area, Lodhi Road, New Delhi - 110 003 (hereinafter called “EPI” which expression shall include its successors and assigns) :

WHEREAS EPI has awarded to the Contractor a Contract for the work of………………. vide its letter of Intent/Work Order No………….. dated………………. (hereinafter called the “Contract”) in terms of which EPI is required to give “Secured Advance” to the Contractor as per Clause no. 35 of the General Conditions of Contract against supply of materials by the Contractor for the project on the security of materials, the quantities, rates and other particulars of which are detailed in the Bill of Quantities for the said Contract.

And WHEREAS by virtue of Clause no. 35 of the General Conditions of Contract of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of EPI for the amount of “Secured Advance” towards the materials actually supplied by the Contractor for the Contract Work from time to time to EPI for the purpose of performance of the Contract. (hereinafter called the “Materials”).

“AND WHEREAS the Contractor has applied to EPI that they may be allowed “Secured Advance” on the security of materials absolutely belonging to them and brought by them to the site of the works for use in construction of the work”.

NOW THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of the “Secured Advance” being given to the Contractor as mentioned in the Contract, for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep EPI indemnified, for the Actual Cumulative Amount of the “Secured Advance” given to the Contractor from time to time against the said Contract. The Contractor hereby acknowledges actual receipt of the materials etc. as per despatch title documents being /to be handed over to EPI from time to time. The Contractor shall hold such materials in trust as a “Trustee” for and on behalf of EPI.
2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the materials at EPI's project site against all risks whatsoever till the materials are duly used/erected in accordance with the terms of the Contract and the plant/package duly erected and commissioned in accordance with the terms of the Contract is taken over by EPI and the Secured Advance is fully adjusted/recovered as per terms of the Contract. The Contractor undertakes to keep EPI harmless against all losses, damages, deterioration and shortages that may be caused to the materials.

3. The Contractor undertakes that the materials shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the materials shall be utilized for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purposes including legal/penal consequences.

4. That EPI is and shall remain the exclusive owner of the materials free from all encumbrances, charges or liens of any kind, whatsoever. The materials shall at all times be open to inspection and checking by the Engineer – In - Charge or other employees/agents authorized by him in this regard. Further, EPI shall always be free at all times to take possession of the materials in whatever form the materials may be, if in its opinion, the materials are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of EPI to handover the materials without any demur or reservation.

5. That this Indemnity Bond is irrevocable. If at any time any loss or damage occurs to the materials or the same or any part thereof is mis-utilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Engineer-In-Charge of EPI as to assessment of loss or damage to the materials shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and /or damaged materials at its own cost and/or shall pay the amount of ‘Secured Advance’ to EPI without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to EPI against the Contractor to recover any amount or all the amounts of this Bond from any dues of the Contractor under the Contract or as per the law.

6. This Bond shall remain in force and effect till the completion of the work as per the aforesaid Contract and till all the amount recoverable under this Bond from the Contractor is fully recovered by EPI. The Bond can not be revoked by the Contractor without the written consent of EPI.

7. That Contractor also agrees that any change in the constitution of the Contractor shall not discharge them from their obligation and liability.

8. This Bond shall be treated as an additional addage to the Contract and nothing herein contained shall be construed to adversely affect the rights of EPI in the Contract.
IN WITNESS WHEREOF, the Contractor has signed this Indemnity Bond through its duly authorized representative on the date and place first above written.

For and on behalf of Contractor

__________________________
(Contractor’s Name)

WITNESS:

1. 1. Signature ..............................
    2. Name .................................
    3. Address ..............................

For and on behalf of Contractor

__________________________
(Contractor’s Name)

WITNESS:

1. 1. Signature ..............................
    2. Name .................................
    3. Address ..............................

Signature .........................
Name (Executant) ...............
Designation ......................
( Authorised representative )

__________________________
(Contractor’s Name)

1. 1. Signature ..............................
    2. Name .................................
    3. Address ..............................

Seal
FORM FOR GUARANTEE BOND
FOR ANTI-TERMITE TREATMENT

THIS AGREEMENT made this ___ day of Two thousand ___ between M/s ________ (hereinafter called the guarantor of the one part and M/s Engineering Projects (India) Limited, hereinafter called EPI hereinafter called the OWNER 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 Engineering Projects (India) Ltd., of the other part whereby the Contractor inter-alia, understood to render the buildings and structures in the said contract recited, completed, termite proof. And whereas the guarantor agreed to give a guarantee to the effect that the said structure will remain termite proof for TEN YEARS to be so reckoned from the date after the maintenance period prescribed in the contract expires.

During this period of guarantee the guarantor shall make good all defects and for that matter shall replace at his risk and cost such wooden member as may be damaged by termite and in case of any other defect being found, he shall render the building termite proof at his cost to the satisfaction of the Engineer-In-Charge and shall commence the works of such rectification within seven days from date of issuing notice from the Engineer-In-Charge calling upon him to rectify the defects falling which the work shall be got done by EPI/ OWNER by some other Contractor at the guarantor’s cost and risk and in the later case the decision of the Engineer-In-Charge as to the cost recoverable from 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 EPI against all losses damages, cost expenses or otherwise which may be incurred by him by reasons 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 EPI/ OWNER, the decision of the Engineer-In-Charge will be final and binding on the parties.

In witness where of these presents have been executed by the Guarantor_______ and by____________ for and on behalf of EPI on the day of month and year first above written.

Signed sealed and delivered by (Guarantor)

IN THE PRESENCE OF:
1.
2.

Signed for and on behalf of EPI by/ in presence of:
1.
2.
GUARANTEE TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS

The agreement made this ................ day of ................ Two thousand ................ between .................................. (hereinafter called Guarantor of the one part) and EPI (hereinafter called the Execution Agency 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 EPI 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 the Guarantor agreed to give a guarantee to the effect that the said structures will remain water and leak proof for ten years from the date of handing over of the structure 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) Alternation 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 notice from the Engineer-In-Charge calling upon him to rectify the defects failing which the work shall be got done by EPI by some other Contractor at the guarantor's cost and risk. The decision of Engineer-In-Charge as to the cost, payable by the Guarantor shall be final and binding.

That if the Guarantor fails to execute the waterproofing or commits breach thereunder, then the Guarantor will indemnify the principal and his successors against all laws.
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 EPI, the decision of the Engineer-In-Charge will 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 EPI 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 EPI by ________________

In presence of :

1. 

2. 
AGREEMENT FORM

This agreement made this day of (Month) (Year), between THE ENGINEERING PROJECTS (INDIA) LIMITED (EPI), (A Govt. of India enterprise) a company incorporated under the Companies Act, 1956 having its Registered and Corporate Office at Core-3, Scope Complex, 7, Institutional area, Lodhi Road, New Delhi – 110003 (hereinafter referred to as the “EPI” which expression shall include its administrators, successors, executors and assigns) of the one part and M/s (NAME OF CONTRACTOR) (hereinafter referred to as the ‘Contractor’ which expression shall unless the context requires otherwise include its administrators, successors, executors and permitted assigns) of the other part.

WHEREAS, EPI, is desirous of construction of (NAME OF WORK) (hereinafter referred to as the “PROJECT”) on behalf of the (NAME OF OWNER/MINISTRY) (hereinafter referred to as “OWNER”), and had invited Tenders as per Tender Documents vide NIT No. _____.

AND WHEREAS (NAME OF CONTRACTOR) had participated in the above referred Tender vide their tender dated _____ and EPI has accepted their aforesaid Tender and award the contract for (NAME OF PROJECT) on the terms and conditions contained in its Letter of Intent No. ________ dated ________ and the documents referred to therein, which have been unequivocally and unconditionally accepted by (NAME OF CONTRACTOR) vide their Letter of Undertaking dated _______ resulting into a contract.

NOW THEREFORE THIS DEED WITNESSETH AS UNDER:

ARTICLE 1.0 – AWARD OF CONTRACT

1.1 SCOPE OF WORK

EPI has awarded the contract to (NAME OF CONTRACTOR) for the work of (NAME OF WORK) on the terms and conditions in its Letter of intent No. ________ dated ________ and the documents referred to therein. The award of work has taken effect from (DATE) i.e. the date of issue of aforesaid letter of intent. The terms and expressions used in this agreement shall have the same meanings as are assigned to them in the “Contract Documents” referred to in the succeeding Article.

ARTICLE 2.0 – CONTRACT DOCUMENTS

2.1 The contract shall be performed strictly as per the terms and conditions stipulated herein and in the following documents attached herewith (hereinafter referred to as “Contract Documents”).

a) EPI Notice Inviting Tender vide No. ________ date ________and EPI’s Tender Documents consisting of:

   i) Instructions to Tenderers and General Conditions of Contract (GCC) alongwith amendments/errata to GCC (if any) issued (Volume-I).
ii) Additional Conditions of Contract including Appendices & Annexures, Volume-II.

iii) Bill of Quantities alongwith amendments/corrigendum of schedule items, if any (Volume-III).

iv) Technical Specifications

v) Drawings

vi) ______________________________________________

b) (NAME OF CONTRACTOR) letter/proposal no._________________ dated ________ and their subsequent communication:

i) Letter of Undertaking of Tender Conditions dated ______________

ii) _____________________________________________________

iii) _____________________________________________________

2.2 EPI’s detailed Letter of Intent No. __________ dated _____ including Bill of Quantities. Agreed time schedule, Contractor’s Organisation Chart and list of Plant and Equipments submitted by Contractor.

2.3 All the aforesaid contract documents referred to in Para 2.1 and 2.2 above shall form an integral part of this Agreement, in so far as the same or any part thereof conform, to the Tender Documents and what has been specifically agreed to by EPI in its Letter of Intent. Any matter inconsistent therewith, contrary or repugnant thereto or deviations taken by the Contractor in its “TENDER” but not agreed to specifically by EPI in its Letter of Intent, shall be deemed to have been withdrawn by the Contractor without any cost implication to EPI. For the sake of brevity, this Agreement alongwith its aforesaid contract documents and Letter of Intent shall be referred to as the “Contract”.

ARTICLE 3.0 – CONDITIONS & CONVENANTS

3.1 The scope of Contract, Consideration, Terms of Payments, Advance, Retention Moneys, Taxes wherever applicable, Insurance, Agreed Time Schedule, Compensation for delay and all other terms and conditions contained in EPI’s Letter of Intent No. __________ dated _____ are to be read in conjunction with other aforesaid Contract Documents. The contract shall be duly performed by the Contractor strictly and faithfully in accordance with the terms of this contract.

3.2 The scope of work shall also include all such items which are not specifically mentioned in the Contract Documents but which are reasonably implied for the satisfactory completion of the entire scope of work envisaged under this contract unless otherwise specifically excluded from the scope of work in the Letter of Intent.

3.3 Contractor shall adhere to all requirements stipulated in the Contract documents.

3.4 Time is the essence of the Contract and it shall be strictly adhered to. The progress of work shall conform to agreed works schedule/contract documents and Letter of Intent.

3.5 This agreement constitutes full and complete understanding between the parties and terms of the presents. It shall supersede all prior correspondence to the extent of inconsistency or repugnancy to the terms and conditions contained in
Agreement. Any modification of the Agreement shall be effected only by a written instrument signed by the authorized representative of both the parties.

3.6 The total contract price for the entire scope of this contract as detailed in Letter of Intent is Rs. _________________ (Rupees _____________________________ only), which shall be governed by the stipulations of the contract documents.

ARTICLE 4.0 – NO WAIVER OF RIGHTS

4.1 Neither the inspection by EPI or the Engineer-In-Charge or Owner or any of their officials, employees or agents nor order by EPI or the Engineer-In-Charge for payment of money or any payment for or acceptance of, the whole or any part of the work by EPI or the Engineer-In-Charge nor any extension of time nor any possession taken by the Engineer-In-Charge shall operate as waiver of any provisions of the contract, or of any power herein reserved to EPI, or any right to damage herein provided, nor shall any waiver of any breach in the contract be held to be a waiver of any other or subsequent breach.

ARTICLE 5.0 – GOVERNING LAWS AND JURISDICTION

5.1 The Laws applicable to this contract shall be the laws in force in India and as amended from time to time.

Jurisdiction shall be of the Court (s) stated in the 'Memorandum' to the “Form of Tender” only.

5.2 Notice of Default

Notice of default given by either party to the other party under the Agreement shall be in writing and shall be deemed to have been duly and properly served upon the parties hereto, if delivered against acknowledgment due or by FAX or by registered mail duly addressed to the signatories at the address mentioned herein above.

IN WITNESS WHEREOF, the parties through their duly authorized representatives have executed these presents (execution whereof has been approved by the Competent Authorities of both the parties) on the day, month and year first above mentioned at New Delhi.

For and on behalf of: For and on behalf of:

(NAME OF CONTRACTOR) M/s. Engineering Projects (I) Ltd.

WITNESS: WITNESS:

1. 1.

2. 2.
ENGINEERING PROJECTS (INDIA) LIMITED
(A Govt. of India Enterprise)

QUALITY CONTROL FORMATS AND CHECKLISTS
<table>
<thead>
<tr>
<th>LAYOUT</th>
<th>Level of base</th>
<th>Dimensional Check (edges &amp; diagonals)</th>
<th>Stirrups</th>
<th>Location of cutouts &amp; services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment</td>
<td>Checked</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STAGING / SCAFFOLDING</td>
<td>Adequacy &amp; rigidity of Props, stays, bracings, conformity to scheme drgs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORMWORK</td>
<td>Qty. of forms and support</td>
<td>Vertical form surface in alignment &amp; plumb</td>
<td>Even Surface</td>
<td>Gaps b/wn shuttering are properly closed</td>
</tr>
<tr>
<td>Props adequate</td>
<td></td>
<td></td>
<td>Oil sprayed</td>
<td>No space for sagging of Form work</td>
</tr>
<tr>
<td>REINFORCEMENT</td>
<td>Cutting &amp; bending as per Bar bending schedule (Schedules attached)</td>
<td>Adequate taps</td>
<td>Chair / cover blocks</td>
<td>Binding wire not touching shuttering</td>
</tr>
<tr>
<td>Dovels &amp; positioning</td>
<td>Provided as per drg.</td>
<td>Walkway for</td>
<td>Labour provided</td>
<td>Fixtures, inserts Cunclits in position</td>
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<tr>
<td>PRE-CONCRETING</td>
<td>Concreting Arrangements</td>
<td>Approval of Construction joint</td>
<td>Mixer / vibrotor</td>
<td>Top level or Concrete marked</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Condition &amp; mixing</td>
<td>Transporting &amp; Placing arrangement</td>
</tr>
<tr>
<td>POST-CONCRETING</td>
<td>Compaction Checked</td>
<td>Removal of Laitance</td>
<td>Post Concreting Level/Dimensions</td>
<td>No. of Cubes Cast</td>
</tr>
<tr>
<td>DESHUTTERING &amp; CLEARING</td>
<td>Cureing days............</td>
<td>Surface finish</td>
<td>Concrete Test</td>
<td>Results OK</td>
</tr>
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<td></td>
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**CLEARANCE from Elect In-charge**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
<th>SITE ENGR</th>
<th>DATE</th>
<th>SITE INCHARGE</th>
<th>DATE</th>
<th>CONSULTANT</th>
<th>DATE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CONTRACT</th>
<th>CHECK LIST FOR CONCRETING</th>
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<tbody>
<tr>
<td>REF DRAWING No.</td>
<td>Location Block</td>
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<td>CONTRACT No.</td>
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<thead>
<tr>
<th>CONTRACT</th>
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<tr>
<td>CONTRACT No.</td>
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<tr>
<td>LAYOUT</td>
<td>Alignment &amp; wall Thickness Checked</td>
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<tr>
<td>SCAFFOLDING</td>
<td>Adequacy of props, Stays, platform</td>
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<tr>
<td>PRE-LAYING</td>
<td>Working arrangements &amp; service provisions checked</td>
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<td>LAYING</td>
<td>Joint thickness &amp; course Ht. As specified</td>
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<tr>
<td>Raking of joints Done (if applicable)</td>
<td>Bearing plaster for Concrete</td>
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<tr>
<td>CURING AND CLEARING</td>
<td>Proper curing of const. Joint</td>
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<tr>
<td>SIGNATURE</td>
<td>W.O. ITEM</td>
</tr>
<tr>
<td>CONTRACTOR</td>
<td>DATE</td>
</tr>
<tr>
<td>CONTRACT</td>
<td>CHECK LIST FOR PLASTERING WORK</td>
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<tr>
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<td>-------------------------------</td>
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<tr>
<td>CONTRACT No.</td>
<td>REF DRAWING No.</td>
</tr>
<tr>
<td>LOCATION BLOCK</td>
<td>FLOOR</td>
</tr>
<tr>
<td>SCAFFOLDING</td>
<td>Platform</td>
</tr>
<tr>
<td>SERVICE</td>
<td>All chasing work Complete</td>
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<tr>
<td>SURFACE PREPARATION</td>
<td>Clearing &amp; rating of surface</td>
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<tr>
<td>PLASTERING</td>
<td>Mix &amp; VMP compound Checked as per specification</td>
</tr>
<tr>
<td>FINISHING</td>
<td>Texture</td>
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**CLEARANCE from Elect In-charge**

**W.O. ITEM** | **UNIT** | **QTY**
---|---|---
**SIGNATURE** | **DATE** | **SITE ENGR** | **DATE** | **SITE INCHARGE** | **DATE** | **CONSULTANT** | **DATE**

---

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<table>
<thead>
<tr>
<th>EXCAVATION</th>
<th>LAYING/RCC</th>
<th>MANHOLE</th>
<th>BACK FILLING</th>
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<tr>
<td>Layout</td>
<td>Bed concrete as per Specifications</td>
<td>Bricks as per specifications</td>
<td>In layers</td>
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<tr>
<td></td>
<td>RCC pipes as per Requirement</td>
<td>Mortar as per specifications</td>
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</tr>
<tr>
<td></td>
<td>Jointing of Pipes</td>
<td>Plastering</td>
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<tr>
<td></td>
<td>Strata bore Dewatering (wherever required)</td>
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</tbody>
</table>

**Check List for Laying of External Sewer**

**Name of Project**: 

**Contract No.**: 

**Ref Drawing No.**: 

**Location Block**, **Floor**, **Area**: 

**Signature**: 

<table>
<thead>
<tr>
<th>W.O. Item</th>
<th>Unit</th>
<th>QTY</th>
</tr>
</thead>
</table>

**Contractor** | **Date** | **Site Engr** | **Date** | **Site Incharge** | **Date** | **Consultant** | **Date** |
<table>
<thead>
<tr>
<th>SCAFFOLDING</th>
<th>Platform</th>
<th>Stability</th>
<th>Movement space</th>
<th>Approach to Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVICE PROVISIONS</td>
<td></td>
<td>All chasing work</td>
<td>Complete</td>
<td>All door/window frames</td>
</tr>
<tr>
<td>SURFACE PREPARATION</td>
<td>Roughening/hacking of surface done</td>
<td>Fixing metal/lath</td>
<td>Chicken mesh</td>
<td>Mortar level</td>
</tr>
<tr>
<td>BASE PLASTER</td>
<td>Mix &amp; W/P compound</td>
<td>Coating/thickness</td>
<td>As specified</td>
<td>Corners &amp; edges sharp &amp; at right angles lines &amp; levels maintained</td>
</tr>
<tr>
<td>TOP LAYER</td>
<td>Fixing of beading for grooves as per drawing</td>
<td>Lines and levels of grooves maintained</td>
<td>Mix as per specification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Washing of top layer</td>
<td>Washing with acid (light)</td>
<td>Curing day</td>
<td>Texture of final surface</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>W.O. ITEM</th>
<th>UNIT</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTRACTOR</td>
<td>DATE</td>
<td>SITE ENGR</td>
<td>DATE</td>
</tr>
</tbody>
</table>

NAME OF PROJECT ____________________________
<table>
<thead>
<tr>
<th>NAME OF PROJECT</th>
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</table>

**CONTRACT**

<table>
<thead>
<tr>
<th>CONTRACT No.</th>
<th>LOCATION BLOCK</th>
<th>FLOOR</th>
<th>AREA</th>
<th></th>
</tr>
</thead>
</table>

**CHECK LIST FOR WASTE/SOIL/VENT PIPES ETC.**

<table>
<thead>
<tr>
<th>REF DRAWING No.</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>Thickness / class as Specified</th>
<th>Length &amp; dia as specified</th>
<th>No cracks or holes visible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make as specified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LAYOUT</th>
<th>Plumb of vertical line checked</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Space distribution &amp; Alignment as spec.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FIXING PIPE &amp; FITTINGS</th>
<th>Cutting &amp; Jointing as Specified</th>
<th>Fixing of fittings &amp; specials as specified</th>
<th>Connection with corr. internal networks</th>
<th>Temporary Plugging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty available for pipes fittings &amp; jointing material as per size &amp; fixing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SMOKE TEST</th>
<th>Injection of smoke</th>
<th>No leakage of Smoke</th>
<th>Section is Ok</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Open ends plugged</td>
<td>Pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**W.O. ITEM**

**UNIT**

**QTY.**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th></th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>CONTRACTOR</th>
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<th>SITE ENGR</th>
<th>DATE</th>
<th>SITE INCHARGE</th>
<th>DATE</th>
<th>CONSULTANT</th>
<th>DATE</th>
</tr>
</thead>
</table>

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NAME OF PROJECT ____________________________

<table>
<thead>
<tr>
<th>CONTRACT No.</th>
<th>CHECK LIST FOR MOSAIC FLOORING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOCATION BLOCK</td>
</tr>
</tbody>
</table>

**LAYOUT**
- Sub base Prepared
  - Provision of Services checked
  - Paneling (max size separator strips)
  - Level of Sub base checked
- Slope Provision checked

**BASE LAYER**
- Mix As specified
  - Water / cement Slurry applied
  - Cement concrete Thickness checked
  - Ramming / leveling Compaction done
- Evenness Checked
  - Joints treatment if any, provided

**TOP LAYER**
- Mix As specified
  - Proper leveling Done
  - Trowelling finish proper
  - Curing done

**FINISHING**
- Grinding
  - Final grinding
  - Repair applied at grinding stages
  - Polishing

<table>
<thead>
<tr>
<th>W.O. ITEM</th>
<th>UNIT</th>
<th>QTY</th>
<th>SIGNATURE</th>
<th>CONTRACTOR</th>
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<th>SITE ENGR</th>
<th>DATE</th>
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</tr>
</thead>
</table>

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# Check List for Glazed Tile Flooring

<table>
<thead>
<tr>
<th>CONTRACT No.</th>
<th>CHECK LIST FOR GLAZED TILE FLOORING</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCATION BLOCK</td>
<td>FLOOR</td>
</tr>
</tbody>
</table>

## Layout
- Service provisions
- Sanitary, electric
- Fixing pattern
- Level of base & dark height marked
- Finish level guide
- Door & window frames in position

## Base
- Mix
- Thickness
- Watering / cement slurry
- Evenness
- Vertically, corners at right angle

## Laying
- Moistening of tiles
- Plan position of cut pieces at corner
- Cut to size
- Smooth edge
- Chamfering of edges & edge matching proper
- Raking / jointing
- Cement slurry adhesive
- Level & plumb checked
- No hollow sound on tapping

## Finishing
- Grouting of joints
- Curing of joints

<table>
<thead>
<tr>
<th>W.O. ITEM</th>
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</tr>
</thead>
</table>

### Signature
- Contractor
- Date
- Site Engr
- Date
- Site Incharge
- Date
- Consultant
- Date
# NAME OF PROJECT

<table>
<thead>
<tr>
<th>MATERIAL AGGREGATE</th>
<th>CHECK LIST FOR WATER BOUND MACADAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradation as specified</td>
<td>Crushing strength as specified</td>
</tr>
<tr>
<td></td>
<td>No of layers</td>
</tr>
<tr>
<td></td>
<td>Thickness of layers starting from subgrade</td>
</tr>
<tr>
<td>SCREENINGS</td>
<td>Crushing strength as specified</td>
</tr>
<tr>
<td>Gradation as specified</td>
<td>As specified</td>
</tr>
<tr>
<td></td>
<td>waiting &amp; rolling as specified</td>
</tr>
<tr>
<td>MOORUM</td>
<td>Crushing strength as specified</td>
</tr>
<tr>
<td>Gradation as specified</td>
<td>Silt content as specified</td>
</tr>
<tr>
<td></td>
<td>Fill material</td>
</tr>
<tr>
<td>LAYOUT</td>
<td>Alignment of central line as per drawings and reference points</td>
</tr>
<tr>
<td></td>
<td>Marking of Carriage way edges as per drawings</td>
</tr>
<tr>
<td></td>
<td>Cross section levels of precedent Layer recorded</td>
</tr>
<tr>
<td>WATER BOUND MACADAM</td>
<td>Templates placed of specified thickness</td>
</tr>
<tr>
<td></td>
<td>Placing, leveling of stone aggregate</td>
</tr>
<tr>
<td></td>
<td>Stone Screening spread as specified</td>
</tr>
<tr>
<td>Dry rolling as specified</td>
<td>Application of moorum as specified</td>
</tr>
<tr>
<td>Top cross section lands layer recorded</td>
<td>Wet rolling / compaction as specified</td>
</tr>
</tbody>
</table>

<table>
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</thead>
</table>

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SECTION - 5
TECHNICAL SPECIFICATIONS FOR ROAD AND BUILDING WORKS

PREAMBLE

Clause 5.1 The Technical specifications contained herein shall be read in conjunction with other documents of bid.

Clause 5.2 The technical specification in accordance with which the entire Work described there in after shall be carried out and completed by the contractor, shall comprise of the following

PART I: GENERAL TECHNICAL SPECIFICATIONS.

PART II: SUPPLEMENTARY TECHNICAL SPECIFICATIONS.

Clause 5.2.1 PART I: GENERAL TECHNICAL SPECIFICATIONS

The General Technical Specification shall be the SPECIFICATIONS FOR BUILDING WORKS as per NBC, IS-456, IS-800 and other relevant IS codes.

Clause 5.2.2. PART II SUPPLEMENTARY TECHNICAL SPECIFICATIONS.

The Supplementary Technical Specification shall comprise various Amendments/ modifications/additions to the “Specifications for Building Works” referred to in Part-I above and Additional Specifications for particular item of work not already covered in Part-I.

Clause 5.2.2.1 A particular clause or a part there of in “Specifications for Building works” referred in Part-I above, where Amended/ Modified / Added upon, and incorporated under Part -II referred to above, such Amendments/ Modified/ additions/ supersede the relevant clause or part of the clause in part I referred to above.

Clause 5.2.2.2 The additional specifications comprise of specifications for particular item of works not already covered in Part-I.

Clause 5.2.2.3 When an Amended/ Modified/ added clause supersedes a clause or part thereof in the said specifications then any reference to the superseded clause shall be deemed to refer to the Amended/Modified/ Added Clause shall always prevail.

Clause 5.2.2.4 If so far any Amended/ Modified/ added clause may come in conflict or be inconsistent with any of the provisions of the said specifications under reference, the Amended/Modified/ Added Clause/latest edition of corresponding standards till 30 (thirty) days before the final date of submission of the tender shall always prevail.

Clause 5.3 GENERAL TECHNICAL SPECIFICATIONS

The SPECIFICATIONS FOR BUILDING WORKS" as per NBC, IS-456, IS-800 and other relevant IS codes. Shall be deemed to be bound into this document.

Note: In the absence of any definite provisions on any particular issue in the aforesaid specifications, reference may be made to the specifications of BIS Codes, where even the above codes are silent, the specifications of ODISHA P.W.D., IRRIGATION DEPARTMENT OR RURAL DEVELOPMENT Departmental specification approved from time to time by the concerned Chief Engineers shall apply. If none of the foregoing applies, the construction and completion of works shall conform to sound Engineering practice as approved by the Engineer in charge. In case of any dispute arising out of the interpretations of the above, the decision of the Engineer in charge shall be final and binding on the bidder.
TECHNICAL SPECIFICATION OF CIVIL PORTION OF WORK

Materials of following specification are to be used in work. The Tenderers are expected to possess and be well conversant with the following IS standard and code of practice.

1. Cement  Will be as per I.S. 269/255 (However the grade of cement to be selected by the Engineer-in-Charge of work and compressive cube test before commencement of work in each batch).
2. Steel  I.S. 432 (Rain) and 1786 (Tor)
3. Vibrator  I.S. 7246
4. Aggregate  I.S. 383, I.S. 515
5. Water for mixing and curing  Shall be clean, free from injurious amount of oil, salt, acid, vegetable materials and other substances and harmful to concrete in conformity to I.S. 456 and I.S. 2025.
7. Binding wire  I.S. 280 (galvanised minimum 1 mm)
8. Rain water pipe  I.S. 2527
9. Construction joints  I.S. 3414
10. Steel Window Frame  I.S. 1038/83
11. Steel Door Frame  I.S. 4351/75
12. Fitting & Fixtures for joinery works  Conforming to I.S. 7452/82 strictly conform to I.S. specification and as per direction of Engineer-in-Charge.

Note: For road work (Approach Road) specification as per road and bridges (latest edition) published by I.R.C & M.O.S.T. shall be followed. In case of any doubt and absence of provision, regarding specification I.S. shall be referred (Indian standard).

ITEM OF WORK

1. Concrete shall be with conformity to I.S.456.
2. Foundation shall be with conformity to I.S.1080.
3. Stone masonry (R.R.) shall be with conformity to I.S.1597 (Part-I)
4. C.R. Masonry shall be with conformity to I.S.1597.
5. Brick masonry shall be with conformity to I.S.2212.
6. Cement plastering shall be with conformity to I.S.9103 & 6925.
7. Mortar shall be with conformity to I.S.2250
8. White and colour washing shall be with conformity to I.S.6278.
9. CC in foundation shall be with conformity to I.S.2571.
10. Anti-Termite Treatment shall be with conformity to I.S.6813. (Part – I & Part – II)
11. Painting to all surfaces shall be with conformity to I.S.2395 (Part – I & Part – II)
12. DPC shall be with conformity to I.S.3067
13. Tarfelt treatment shall be with conformity to I.S.1346
14. Mosaic flooring with conformity to I.S.2114
15. Steel painting shall be with conformity to I.S.1477 (Part – I & Part – II) I.S.1661
**Fenesta 1000 Series Window (UPVC)**

Supply and fixing of Un-plasticized Poly Vinyl Chloride (UPVC) sliding windows of FENESTA - only two glass shutters sliding duly manufactured using UPVC reinforced profiles of 80mm x 52mm x 2.25mm or equivalent for outer frames, 54mm x 38mm x 2.25mm or equivalent for sliding shutter frames capable of mounting single glazing system, structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.2mm prefabricated & welded through fusion welding the window sash shall be fitted with 5mm thick clear float glass (toughened) of reputed make duly fixed with EPDM weathering seal resistant accessories like clipping locking system made of aluminium 1 no., per set of sashes and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing / deglazing at site with 10 years manufactures warranty for discoloration, wrapping, mechanical failures, shrinkages, rotting, corrosion etc. with a quality certificate from relevant department of Govt. of India, including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site with templates for casement sizing complete for finished item of work (structural requirements profiles are to be got approved by the Engineer-in-Charge of the work before fabrication of the shutter) as per specification and direction of the Engineer-in-Charge.

**Vitrified Fully Charged Tile**

Supplying, fitting and fixing Vitrified (Fully) Stain free, Sandmist, Tropicana, Double charged Tile of make Carolina, Johnson, Somany or equivalent of colour White / Pink in floors of size 1000mm x 1000mm / 600mm x 600mm having thickness not less than 12mm conforming to IS : 15622 -2006 laid on 20 mm thick cement mortar (1:4) and filling joints with white cement of approved quality including cost of all materials, labour T&P etc. required for the work all complete as per specification and direction of the Engineer-in-Charge.

**Germ Free Wall Tile**

Providing, Fitting and Fixing of Germ free Wall Tile (size 600mm x 300mm) of Johnson or equivalent make in dados /skirting and risers of steps on 12mm thick cement plaster (1:3) jointed with neat cement slurry mixed with pigments to match the shade of the tiles including cost, carriage, cost of all labour etc. complete as per specification and direction of the Engineer-in-Charge.

**Ultra Eurocon Tile in Floor**

Providing, Fixing of prepolished cement concrete tiles (floor) confirm to IS:1237:1980 (Reaffirmed in 1996) for heavy duty tiles (Exterior Grade) of 22-25mm thick of make Ultra Eurocon or Duracrete, Abrasion and wear resistant, as per parten, size and colour as specified or as approved by Engineer-in-Charge to be used in floor laid over cement mortar (1:4) 20mm thick required neat cement jointing curing and cleaning complete. Item is based on product sample and specification of Ultra, Eurocon or Duracrete Tile as per specification and direction of the Engineer-in-Charge.

**Ultra Eurocon Tile in Dado**

Providing, Fixing of prepolished cement concrete tiles (floor) confirm to IS:1237:1980 (Reaffirmed in 1996) for heavy duty tiles (Exterior Grade) of 22-25mm thick of make Ultra Eurocon or Duracrete, Abrasion and wear resistant, as per parten, size and colour or equivalent make in dados /skirting and risers of steps on 12mm thick cement plaster (1:3) jointed with neat cement slurry mixed with pigments to match the shade of the tiles including cost, carriage, cost of all labour etc. complete as per specification and direction of the Engineer-in-Charge.

**Structural Glazing / ACP Combination**

Providing and fixing of Structural Glazing approved make to be fabricated from rolled formed sections made of pre-painted steel(base steel as per IS-513 of 0.6mm thick 'D' quality galvanized as per IS-277 with zinc of 120gm per sqm.) with primer of 5 - 75.7microns thick and finished paint with po-yster paint ( Black / Pearl white / Chocolate brown) of12-16microns along with the alkylbacker at the back of 5-7 microns and the sizes of outer frame being 46 x 52mm and with all vertical & horizontal mullions are of46 x 70mm and fixed beading are of 18 x 25mm. Sections for internal top and bottom frames in the louvered area should be 18 x40mm. Top hung shutter should be 46x46mm. Accessories/ed beading are of 18x25mm. Accessories/ gaskets are to be used as per the manufacturer's supply and specification like handle
being made of high grade aluminum powder coated and with nylon receiver and gasket will be made of EPDM. All corner brackets are to be made of CRCA with zinc phosphating. The mullion caps and louvered-clips should be glass filled nylon. The sections are to be cut to length jointed and assembled by means of corner bracket and frames are fixed to the concrete / masonry walls by means of self expanding screws and glass to be used with safety laminated glass of 12.38 mm thick with 0.76 mm inter layer Poly Vinyl Butyral (PVB) lamination between two glass with outer being 6 mm thick toughened reflective of Reflectsol series of Saint Gobain & inner glass being of 6mm thick toughened clear of Saint Gobain make with all taxes.

| Panel | Aluminum Ceiling
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gypsum Board</td>
</tr>
</tbody>
</table>

Providing and fixing of Aluminum composite panel of Alvcobond Durabuild or equivalent make coated with polyvinylidence flourie (PVDF) resin cold coating on top and autocorrosive primer on the black aluminum panel with cost, conveyances, royalties, taxes of all materials and cost of all labour with T&P required for the work etc. complete as per specification & direction of Engineer-in-charge.

| Gypsum Board | Providing & fixing Plain Gypsum board ceiling suspended from roof by adjustable G.I. ceiling angle with spread at a distance not more than 600mm fixed to roof by Row plug & stiff cleat , Gypsum board 12.5mm thick held by G.I perimeter channel MF-3 & intermediate channel MF-7 framing, boarding, jointing & finishing with special type of gypsum compound etc including cost, conveyance & taxes of all materials, labour with T & P etc. complete in all respects directed by the Engineer in charge.

| Armstrong Ceiling | Providing false ceiling made out of Armstrong acoustical fine fissured RH-99 board NRC 0.55 sound attention 34 db fixed with frame made of G.I. perimeter channel runners (GYP steel make or equivalent boarded company) etc. and hanged from R.C. roof slab on 600mm x 600mm grid including cost, conveyance, taxes of all materials with cost of labour and T&P required for the work complete as per direction of Engineer-in-Charge.

| Cornice for Gypsum Board | Providing fixing and fitting of cornice for gypsum board ceiling 4" wide of approved quality and approved make conferring to I.S with necessary bend etc. complete fixed to wall with screw etc as per the direction of E.I.C including cost of all material with taxes labour T&P etc. complete.

| Sikadur | Providing fitting and fixing Sikadur combiflex treatment SG 20P 200 and sealed by Sikadur 31C @ 1.4kg. Per meter over the expansion joint after cleaning the joints and applying of Sikadur 32 @ 200gms per meter epoxibonding agent and leveled by Sikagrount 214 @ 8kg, pr meter and covered with 300 mm wide, 16 gauge Aluminum Sheet complete including cost conveyance, taxes of all materials, labour, transportation charges etc. as per the specification and direction of the Engineer-in-charge.

| Anti Termite Treatment | Providing anti-termite treatment using approved quality of chemical emulsion, spraying the mixture uniformly by sprayer as pre-constructional anti termite treatment and creating a chemical barrier under and around the column pits, wall trenches, top surface of plinth filling, junction of walls & floors along with external perimeter of the building, expansion joints, surrounding the pipes and conduits etc. complete at the rate as directed by the manufacturer confirming to IS:6313 (Part-II) and as per direction of Engineer-in-Charge including cost of all materials, labour, sundries, T&P etc. complete. (The payments shall be made on the basis of actual plinth area of the building at Ground floor & vertical faces will not be measured for payment.) Note:- The Contractor shall have to furnish 10years Guarantee to maintain the anti-termite treated area / structures free from termite.

| Flush Door | Suppling, fitting and fixing Factory made 32mm thick B.W.P. I.S.I, marked flush door / window of Century / Mayur make or similar type with seven years guarantee against termite and borer etc. by using 25mm thick BWP ply with vinior laminated with two sides complete with wooden hinged cleats including cost of Stainless Steel fittings like Tower Bolt, Handel, Aldrop, Hinges, Screw etc., with conveyance and taxes of all materials complete in all respect as per direction of Engineer-in-charge.

| Fixed Glazing with part top hung | Providing and fixing of Fixed Glazing with part Top hung of approved make to be fabricated from roll formed sections made of pre-painted steel (base steel as per IS-513 of 0.6 mm thick “D” quality, galvanized as per IS-277 with zinc of 120 Gm/Sq.mtr) with paint specification being with primer of 5-7 microns and finished paint with polyester
Providing and fixing of Swing Door of approved make to be fabricated from roll formed sections made of pre-painted steel (base steel as per IS-513 of 0.6 mm thick “D” quality, galvanized as per IS-277 with zinc of 120 Gm/Sq.mtr) with paint specification being with primer of 5-7 microns and finished paint with polyester paint (Black /Pearl white/ Chocolate Brown) of 12-16 microns along with the alkyd backer at the back of 5-7 microns and the sizes of outer frame being of 46x52 mm and with all vertical and horizontal mullions are of 46x70 mm and fixed beadings are of 18x25 mm. Top hung shutter should be of 46 x 46 mm. Accessories / gaskets are to be used as per the manufacturer’s supply and specification like handle being made of high grade aluminum powder coated and with nylon receiver and gasket will be made of EPDM. All corner brackets are to be made of CRCA with zinc phosphating. The mullion caps and louvered-clips should be of glass filled nylon. The sections are to be cut to length, miter joined with corner bracket and frames are fixed to the concrete/masonry walls by means of self expanding screws and glass to be used of 5 mm reflective with all taxes complete.

Providing of Swing Door of approved make to be fabricated from roll formed sections made of pre-painted steel (base steel as per IS-513 of 0.6 mm thick “D” quality, galvanized as per IS-277 with zinc of 120 Gm/Sq.mtr) with paint specification being with primer of 5-7 microns and finished paint with polyester paint (Black /Pearl white/ Chocolate Brown) of 12-16 microns along with the alkyd backer at the back of 5-7 microns and the sizes of outer frame being of 46x52 mm and with all vertical and horizontal mullions are of 46x70 mm and fixed beadings are of 18x25 mm. Top hung shutter should be of 46 x 46 mm. Accessories / gaskets are to be used as per the manufacturer’s supply and specification like handle being made of high grade aluminum powder coated and with nylon receiver and gasket will be made of EPDM. All corner brackets are to be made of CRCA with zinc phosphating. The mullion caps and louvered-clips should be of glass filled nylon. The sections are to be cut to length, miter joined with corner bracket and frames are fixed to the concrete/masonry walls by means of self expanding screws and glass to be used of 5 mm reflective with all taxes complete.

Providing of Swing Door of approved make to be fabricated from roll formed sections made of pre-painted steel (base steel as per IS-513 of 0.6 mm thick “D” quality, galvanized as per IS-277 with zinc of 120 Gm/Sq.mtr) with paint specification being with primer of 5-7 microns and finished paint with polyester paint (Black /Pearl white/ Chocolate Brown) of 12-16 microns along with the alkyd backer at the back of 5-7 microns and the sizes of outer frame being of 46x52 mm and shutter being of 46 x 46 mm and lock rail should be of 23 x 130mm. Accessories / gaskets are to be used as per the manufacturer’s supply and specification like handle, lock and floor spring of approved quality. Gasket will be made of EPDM. All corner brackets are to be made of CRCA with zinc phosphating. The sections are to be cut to length, miter joined with corner bracket and frames are fixed to the concrete/masonry walls by means of self expanding screws and glass to be used of 5 mm reflective with all taxes complete including cost of all materials all taxes labour, labour cess, T&P etc. complete as per direction of Engineer-in-Charge.
| Anti Skid Vetriified Floor Tiles | Fixing of Anti skid Vetriified floor tiles of premium grade having thickness 8mm to 10mm confirming to IS 13756 of size 60cm x 60cm coloured / printed series in floors, Trades of steps & Landing over 20mm thick bed of cement mortar 1:4 jointed with cement slurry mixed with pigments to match the shade of the tiles, including rubbing & polishing etc. complete including cost, conveyance, taxes & royalties of all materials, labour with T&P complete in all respect. |
| Chequered Floor Tile | Fixing of Chequered tiles of premium grade having thickness 7mm to 8mm confirming to IS 13755 of size 30cm x 30cm special plain / printed series in floors over 20mm thick bed of cement mortar 1:4 jointed with cement slurry mixed with pigments to match the shade of the tiles, including rubbing & polishing etc. complete including cost, conveyance, taxes & royalties of all materials, labour with T&P complete in all respects as per direction of Engineer-in-Charge. |
| Ceramic Wall Tile | Fixing of Ceramic wall tiles of premium grade having thickness 6.5mm to 6.7mm confirming to IS 13753 of size 30cm x 20cm special plain / printed series in dados skirting & riser of steps on 12mm thick cement plaster 1:3 joined with neat cement slurry mixed with pigments to match the shade of the tiles, including rubbing & polishing etc. complete including cost, conveyance, taxes & royalties of all materials, labour with T&P complete in all respects as per direction of Engineer-in-Charge. |
| Stainless Steel Ceiling | Providing & Fixing of Clip-in Swing Down plain (Mirror/Brush )finish Stainless Steel (SS)ceiling System consisting of 600x600 mm clip in tiles of stainless steel in 0.5 mm thickness with bevel edge in white colour (RAL 9010) with Light Reflectance > 60% and suitable for Green Building application with Recycled content of 25%. The product must be conforming EN13964:2004 standard. The Clip-in Tile & Grid system used together should carry a 15 year warrante. Comprising of Double Frame System , consisting of 3000mm long 'C' channels spaced at 1200mm C/C securely fixed to the structural soffit by support damp & approved hangers. The last hanger at the end of each "C" channel should not be greater than 600mm from the adjacent wall, using "C"-channel connector for splicing two pieces of "C"-channels. 4000mm Dp-12 Main carriers (spring tee bars) shall be spaced at 600mm C/C in a direction perpendicular to the "C"-channels and shall be secured at every intersection with C channel using a dp-12 hanger. Tiles should be clipped in between two Dp-12 carriers (spring tee bars) from bottom. Perimeter trims to be of SS wall angles of secured to walls at maximum 450mm C/C. Cut tiles to be secured to the wall angles using a spring damp ,complete in all respect with all cost, labour, T & P, Taxes etc as per direction of the Engineer- in-charge.(To be used only in Operation Theaters) |
1.1 : GENERAL INSTRUCTIONS:  The detailed specifications given hereinafter are for the items of works described in the schedule of quantities attached herein, and shall be guidance for proper execution of work to the required standards. It may also be noted that the specifications are of generalized nature and these shall be read in conjunction with the description of item in schedule of quantities and drawings. The work also includes all minor details of construction which are obviously and fairly intended and which may not have been referred to in these documents but are essential for the entire completion in accordance with standard Engineering practice.

Unless specifically otherwise mentioned, all the applicable latest codes and standards published by the Indian Standard Institution and all other standards shall govern in all respects of design, workmanship, quality and properties of materials and methods of testing, method of measurements etc. Wherever any reference to any Indian Standard Specification occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued their to or revisions thereof, if any. In case there is no I.S.I. specification for the particular work, such work shall be carried out in accordance with the instructions in all respects, and requirements of the Engineer-in-Charge. The work shall be carried out in a manner complying in all respects with the requirements of relevant bye-laws of the Municipal Committee/Municipal Corporation/Development Authority/Improvement Trust etc. under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-Charge and, unless otherwise mentioned, nothing extra shall be paid on this account.

Samples of various materials, fittings etc. proposed to be incorporated in the work shall be submitted by the contractor for approval of the Engineer-in-charge before order for bulk supply is placed.

The contractor shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials in any place. No excavated earth or building materials shall be stacked on areas where other buildings, roads, services, compound walls etc. are to be constructed.

The contractor shall maintain in perfect condition all works executed till the completion of the entire work allotted to him. Where phased delivery is contemplated, this provision shall apply to each phase.

The contractor shall give a performance test of the entire installation(s) as per standard specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.

The contractor shall clear the site thoroughly of all debris, surplus excavated materials and rubbish etc. left out of his work and dress the site around the building to the satisfaction of the Engineer-in-Charge before the work is considered as complete.

The Chief Engineer, Buildings shall be the sole deciding authority as to the meaning, interpretations and implications for various provisions of the specifications and his decision in writing shall be final and binding on all concerned.

In case any difference or discrepancy between the specifications and the description in the schedule of quantities, the schedule of quantities shall take precedence. In case of any difference or discrepancy between specifications and drawing, the specifications shall take precedence. In case any difference or discrepancy between the specifications for Civil works and specification for Public Health Engg. works, specifications for Civil works shall take precedence.

1.2 LIST OF INDIAN STANDARDS

The following IS codes shall be referred in execution of PH Engineering works.

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<td>7834-1987 (Pt. II)</td>
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<td>Specific requirements for 45 elbows 0</td>
</tr>
<tr>
<td>7834-1987 (Pt. III)</td>
<td>Reaffirmed 2003</td>
<td>Specific requirements for 90 elbows 0</td>
</tr>
<tr>
<td>7834-1987 (Pt. IV)</td>
<td>Reaffirmed 2003</td>
<td>Specific requirements for 90 tees 0</td>
</tr>
<tr>
<td>7834-1987 (Pt. V)</td>
<td>Reaffirmed 2003</td>
<td>Specific requirements for 45 tees 0</td>
</tr>
<tr>
<td>7834-1987 (Pt. VI)</td>
<td>Reaffirmed 2003</td>
<td>Specific requirements for sockets</td>
</tr>
<tr>
<td>7834-1987 (Pt. VII)</td>
<td>Reaffirmed 2003</td>
<td>Specific requirements for unions</td>
</tr>
<tr>
<td>7834-1987 (Pt. VIII)</td>
<td>Reaffirmed 03</td>
<td>Specific requirements for caps</td>
</tr>
<tr>
<td>8008 (Pt. I to VII)</td>
<td>Reaffirmed 2003</td>
<td>Injection moulded HDPE fittings for potable water supplies</td>
</tr>
<tr>
<td>8008-2003 (Pt. I)</td>
<td>Reaffirmed 1997</td>
<td>General requirements for fittings</td>
</tr>
<tr>
<td>8008-1976 (Pt. II)</td>
<td>Reaffirmed 1997</td>
<td>Specific requirements for 90 bends 0</td>
</tr>
<tr>
<td>8008-2003 (Pt. III)</td>
<td>Reaffirmed 1997</td>
<td>Specific requirements for 90 tees 0</td>
</tr>
<tr>
<td>8008-2003 (Pt. IV)</td>
<td>--</td>
<td>Specific requirements for reducers</td>
</tr>
<tr>
<td>8008-2003 (Pt. V)</td>
<td>--</td>
<td>Specific requirements for ferrule reducers</td>
</tr>
<tr>
<td>8008-2003 (Pt. VI)</td>
<td>--</td>
<td>Specific requirements for pipe ends</td>
</tr>
<tr>
<td>8008-2003 (Pt. VII)</td>
<td>--</td>
<td>Specific requirements for sandwich flanges</td>
</tr>
<tr>
<td>8090 - 1976</td>
<td>Reaffirmed 2000</td>
<td>Coupling, branch pipe, nozzle used in hose reel tubing for fire fighting</td>
</tr>
<tr>
<td>8329-2000</td>
<td>--</td>
<td>Centrefugally cast (spun) ductile iron pressure pipes and fittings for water, gas &amp; sewage</td>
</tr>
<tr>
<td>8413 (Pt. I)</td>
<td>Reaffirmed 2001</td>
<td>Requirements for biological treatment equipment</td>
</tr>
<tr>
<td>8413-1977 (Pt. I)</td>
<td>Reaffirmed 2001</td>
<td>Trickling Filter</td>
</tr>
<tr>
<td>8718-1978</td>
<td>Reaffirmed 2000</td>
<td>Specifications for vitreous enameled steel kitchen sinks</td>
</tr>
<tr>
<td>8727-1978</td>
<td>Reaffirmed 2000</td>
<td>Specifications for vitreous enameled steel wash basin</td>
</tr>
<tr>
<td>8835-1978</td>
<td>Reaffirmed 1999</td>
<td>Guideline for planning and design of surface drains.</td>
</tr>
<tr>
<td>8931-1993</td>
<td>Reaffirmed 2003</td>
<td>Specifications for copper alloys Fancy single taps, combination tap assembly &amp; stop valves for water services</td>
</tr>
<tr>
<td>9140-1996</td>
<td>Reaffirmed 2002</td>
<td>Method of sampling of vitreous &amp; fire day sanitary appliances</td>
</tr>
<tr>
<td>Year</td>
<td>Reaffirmed Year</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>9293-1991</td>
<td>Reaffirmed 1996</td>
<td>Specifications for flax canvas</td>
</tr>
<tr>
<td>9338-1984</td>
<td>Reaffirmed 2000</td>
<td>Specifications for Cast Iron screw down stop valves and stop &amp; check valves for water works purposes</td>
</tr>
<tr>
<td>9758-1981</td>
<td>Reaffirmed 2003</td>
<td>Flush valves and Fittings for water dosets and urnials</td>
</tr>
<tr>
<td>9762-1994</td>
<td>Reaffirmed 2004</td>
<td>Specifications for polyethylene floats for float valves</td>
</tr>
<tr>
<td>9763-2000</td>
<td>--</td>
<td>Specifications for Plastic Bib taps, pillar taps, angle valves and stop valves for hot &amp; cold water service.</td>
</tr>
<tr>
<td>10221-1982</td>
<td>Reaffirmed 1997</td>
<td>Code of practice for coating and wrapping of underground M.S. steel pipeline,</td>
</tr>
<tr>
<td>12183-1987 (Pl.1)</td>
<td>Reaffirmed 2004</td>
<td>Code of practice for Plumbing in multi-storied buildings (for water supply)</td>
</tr>
<tr>
<td>12235-1986</td>
<td>Reaffirmed 1998</td>
<td>Method of test for UPVC pipe for potable water supply</td>
</tr>
<tr>
<td>12469-1988</td>
<td>Reaffirmed 2002</td>
<td>Specifications for pumps</td>
</tr>
<tr>
<td>12592-2002</td>
<td>--</td>
<td>Precast concrete frame &amp; cover (SFRC frame &amp; cover)</td>
</tr>
<tr>
<td>12701-1996</td>
<td>Reaffirmed 2002</td>
<td>Specifications for rotational moulded polyethylene water storage tanks</td>
</tr>
<tr>
<td>13095-1991</td>
<td>Reaffirmed 2003</td>
<td>Butterfly valves for general purposes</td>
</tr>
<tr>
<td>13382-2004</td>
<td>--</td>
<td>Cast Iron specials for mechanical &amp; push-on flexible joints for pressure pipelines for water, gas &amp; sewage.</td>
</tr>
<tr>
<td>13592-1992</td>
<td>Reaffirmed 2002</td>
<td>Specifications for PVC soil, waste &amp; rain water (SWR) including ventilation pipes</td>
</tr>
<tr>
<td>13983-1994</td>
<td>Reaffirmed 2004</td>
<td>Specifications for stainless steel kitchen sinks &amp; drain boards for domestic purpose</td>
</tr>
<tr>
<td>14845-2000</td>
<td>Reaffirmed 2004</td>
<td>Resilient seated cast iron air relief valves for water works purposes – Spn</td>
</tr>
<tr>
<td>14846-2000</td>
<td>--</td>
<td>Specifications for sluice valve for water works purposes (50 to 1200 mm size)</td>
</tr>
<tr>
<td>15285-2003</td>
<td>--</td>
<td>Specifications for flexible PVC pipes or polymer reinforcement thermoplastic hoses for suction and delivery lines for Agricultural pumps.</td>
</tr>
<tr>
<td>15328-2003</td>
<td>--</td>
<td>UPVC non pressure pipes for use in underground drainage and sewerage system – Specifications.</td>
</tr>
</tbody>
</table>
1.3 MINIMUM WEIGHT OF MOST COMMONLY USED SANITARY APPLIANCES & WATER FITTINGS:

The minimum unit weight of each fitting shall not be less than as given in the following table and tolerance for weight shall be as per relevant IS code.

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Description of items</th>
<th>Nominal size/thickness</th>
<th>IS code</th>
<th>Minimum Unit Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brass non-fancy type Bib Tap Please see Table under relevant item for other sizes.</td>
<td>15mm</td>
<td>781-1984</td>
<td>400 Grams</td>
</tr>
<tr>
<td>2</td>
<td>C.P. brass fancy type Bib Tap</td>
<td>15mm</td>
<td>8931-1993</td>
<td>550 Grams</td>
</tr>
<tr>
<td>3a</td>
<td>Brass non-fancy types Stop cock- Internally threaded</td>
<td>15mm</td>
<td>781-1984</td>
<td>330 Grams</td>
</tr>
<tr>
<td>3b</td>
<td>Brass non-fancy types Stop cock- Externally threaded</td>
<td>15mm</td>
<td>781-1984</td>
<td>400 Grams</td>
</tr>
<tr>
<td>4</td>
<td>C.P. brass fancy types Stop cock</td>
<td>15mm</td>
<td>8931-1993</td>
<td>550 Grams</td>
</tr>
<tr>
<td>5</td>
<td>C.P. brass concealed typed Stop cock</td>
<td>15mm</td>
<td>8931-1993</td>
<td>750 Grams</td>
</tr>
<tr>
<td>6</td>
<td>C.P. brass fancy Pillar Tap</td>
<td>15mm</td>
<td>1795-1982</td>
<td>650 Grams</td>
</tr>
<tr>
<td>7</td>
<td>C.P. brass waste coupling</td>
<td>32mm</td>
<td>3311-1979</td>
<td>200 Grams</td>
</tr>
<tr>
<td>8</td>
<td>C.P. brass waste coupling</td>
<td>40mm</td>
<td>3311-1979</td>
<td>250 Grams</td>
</tr>
<tr>
<td>9a</td>
<td>C.I. Nahani Trap 165mm inlet</td>
<td>75mm (outlet)</td>
<td>1729-2002 / 3989-1984</td>
<td>6.50 Kg. dia.</td>
</tr>
<tr>
<td>9b</td>
<td>C.I. Roor Trap 100 mm inlet dia.</td>
<td>75mm (outlet)</td>
<td>1729-2002 / 3989-1984</td>
<td>4.80 Kg.</td>
</tr>
<tr>
<td>9c</td>
<td>C.I. Nahani Trap with 20 mm water seal</td>
<td>65mm (outlet)</td>
<td>non ISI</td>
<td>4.50 Kg.</td>
</tr>
<tr>
<td>10</td>
<td>Cast iron surface box for sluice valve (rectangular shape)</td>
<td></td>
<td>3950-1979</td>
<td>33 kg.</td>
</tr>
</tbody>
</table>

The minimum unit weight of each fitting shall not be less than as given in the following table, which are used in General practice.

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Description of items</th>
<th>Nominal size / thickness</th>
<th>Minimum Unit Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C.P. brass fancy Shower rose</td>
<td>15mm</td>
<td>125 Grams</td>
</tr>
<tr>
<td>2</td>
<td>C.P. brass bottle trap</td>
<td>32mm.</td>
<td>500 Grams</td>
</tr>
<tr>
<td>3</td>
<td>C.P. brass bottle trap</td>
<td>40mm</td>
<td>550 Grams</td>
</tr>
<tr>
<td>4</td>
<td>C.P. brass Liquid soap dispenser</td>
<td></td>
<td>250 Grams</td>
</tr>
<tr>
<td>5</td>
<td>C.P. brass coat and hat hook</td>
<td></td>
<td>150 Grams</td>
</tr>
<tr>
<td>6</td>
<td>C.P. brass Towel rod bracket [pair]</td>
<td></td>
<td>100 Grams</td>
</tr>
<tr>
<td>7</td>
<td>C.P. brass Towel rod [600 mm long]</td>
<td>20mm</td>
<td>150 Grams</td>
</tr>
<tr>
<td>8</td>
<td>G.I. Clamps thickness for GI piping</td>
<td>2 MM</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>MS Clamps thickness for CI piping</td>
<td>3 MM</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Rain water lead sheet flashing</td>
<td></td>
<td>38.00 kg/sqm</td>
</tr>
<tr>
<td>11</td>
<td>C.I. frame and cover for Gully Trap</td>
<td></td>
<td>7.50 kg.</td>
</tr>
<tr>
<td>12</td>
<td>S.S. grating for Nahani Trap</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.4 MANDATORY TESTS / OPTIONAL TESTS :-

1. The following mandatory tests shall be carried out when the qty. of materials to be incorporated in the work exceeds the minimum qty. specified in col.5 of the table below irrespective of whether the materials are with I.S. mark, or otherwise.

2. Optional tests specified or any other tests shall be carried out in case of specialized work/important structure at Department’s discretion.

3. Testing charges including incidental charge and cost of sample for testing shall be borne by the contractors for all mandatory tests.

4. Testing charges for optional tests shall be paid by the Dept. However, the incidental charges and cost of sample for testing shall be borne by the contractor.

5. In case of non-I.S. materials, it shall be the responsibility of the contractor to establish the conformity of material with relevant I.S. specification by carrying out necessary tests. Testing charges including incidental charge and cost of sample for testing shall be borne by the contractors for such tests.

1.4.1 Mandatory tests for P.H.E. works:

<table>
<thead>
<tr>
<th>Material</th>
<th>Test</th>
<th>Field/lab test</th>
<th>Test Procedure</th>
<th>Minimum quantity of material / work for carrying out the test</th>
<th>Frequency of sampling</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| GI pipes | Physical  
Dimensional unit weight | Field/lab | IS 4736  
Field/lab  
Lab | IS 228  
Lab | 5 tubes  
>20 tubes  
>20 tubes  
>100 / 500  
upto 25 mm  
bore > 25 mm  
respectively.  
Up to bore 25mm tube / 1000 or part thereof > 25mm bore 1 tube / 500 tube | Sampling & criteria for conformity as per 4711 |
|          | Nominal unit wt. Tensile,  
Elongation | Field/lab | Lab | Lab | | |
|          | Chemical  
Mass of inc coating | Field/lab | IS 228  
Lab | IS 228 | | |
|          | sulphur, phosphorus | Field/lab | Lab | Lab | | |
| C.I. pipes | Water Quality  
“LA/A/B” class | Field/lab  
Hammer test | Field/lab  
Hydrostatic test | Field/lab  
Hardness & grade | Field/lab | > 20 copies  
> 20 copies  
> 20 copies  
> 20 copies  
> 20 copies  
> 20 copies | Sampling & conformity as per IS 1536 / 2001  
IS1500  
Hardness & grade shall be optional |
|          | Soil Quality | Field/lab  
Hammer test | Field/lab  
Hydrostatic test | Field/lab  
Hardness & grade | Field/lab | > 20 copies  
> 20 copies  
> 20 copies  
> 20 copies  
> 20 copies  
> 20 copies | Sampling & conformity as per IS 3981, IS 1729, IS 1500  
Hardness & grade shall be optional |
<table>
<thead>
<tr>
<th>Pig lead</th>
<th>Chemical Analysis</th>
<th>Lab</th>
<th>IS 1817</th>
<th>Lot &gt; 1000 Kg, if less Mfr. Test report to be furnished</th>
<th>Each lot &gt; 1000 Kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Store ware pipes</td>
<td>Hydraulic Test, Absorption Test, Test for Acid Resistance, Test for Alkali Resistance, Crushing strength Test For Alkali Resistance crushing strength test</td>
<td>Lab</td>
<td>IS 651</td>
<td>3 no. for lot of 150 5 no. for 151 to 1200 8 nos. for 1201 to 10000</td>
<td></td>
</tr>
<tr>
<td>Cement Bricks</td>
<td>As per Civil specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precast concrete man hole frame &amp; covers / gratings</td>
<td>Dimension Load test</td>
<td>Lab</td>
<td>IS 12592 (Part I)</td>
<td>&gt; 20 frame &amp; covers / gratings</td>
<td>Sampling as per IS 12592 (Part-I)</td>
</tr>
<tr>
<td>CI man hole frame &amp; covers</td>
<td>Dimension Load test</td>
<td>Lab</td>
<td>IS 1726</td>
<td>&gt;50 frame &amp; covers / gratings</td>
<td>Sampling as per IS 1726</td>
</tr>
<tr>
<td>Hume pipe NP class</td>
<td>Dimension Hydrostatic test Three-edge bearing Absorption test</td>
<td>Lab/field Lab Lab Lab</td>
<td>IS 458 IS 3597 IS 3597 IS 3597</td>
<td>&gt;50 pipes As per IS 458</td>
<td></td>
</tr>
<tr>
<td>Sanitary fittings</td>
<td>Manufacturer's Test certificate to be produced IS mark materials.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CP brass fittings Bib taps / stop cocks</td>
<td>Manufacturer's Test certificate to be produced IS mark materials.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.0 SANITARY INSTALLATIONS

3.1 INDIAN WATER CLOSET

3.1.01 GENERAL: The item pertains for providing white or colour glazed vitreous china ware Indian water closet of size and colour as specified in the schedule including fixing.

3.1.02 MATERIAL: Squatting Pan (Orissa Pattern) is of white or colour glazed vitreous China conforming IS 2556 Part III. Pan shall have flushing rim and are inlet of self draining type. It shall have weep hole at the following inlet to the Pan. The flushing inlet shall be in front unless otherwise specified. The inside of the bottom of the pan shall have sufficient slope from the front to the outlet and surface shall be uniform and smooth to enable easy and quick disposal while flushing. The exterior surface of the outlet below the flange shall be an unglazed surface which shall have groove at right angle to the axis of the outlet. In all the cases pan shall have be provided with 100 mm Glazed Vitreous China ‘P’ or ‘S’ trap with 50 mm water seal and 40 mm size vent ham.

3.1.03 FIXING: The water closet pan shall be placed in position as shown in the drawing. The IWC shall be supported on brick masonry in CM 1:4 or as directed by the Engineer-in-charge. The pan shall be fixed slightly lower than the floor level. If the pan or trap is damaged during handling of fixing, it shall be
replaced by the contractor at his own cost. The pan, trap and C.I. pipe shall be jointed in 1:1 Cement Mortar with hemp yarn caulked. The gap between W.C. and floor shall be finished with white/matching cement as directed.

3.1.04 PROTECTION AND FINAL CLEANING: The IWC shall be covered with husk and sand till all the civil and electrical works are completed and shall be removed and cleaned on completion of civil and electrical works prior to testing and handing over. However the contractor should ensure that the outlet is plugged with gunny bags or similar materials to avoid the pipe getting blocked.

3.2 EUROPEAN/ ANGLO INDIA WATER CLOSET:

3.2.01 GENERAL: The item pertains for providing white or colour glazed vitreous china ware European or Anglo Indian water closet with seat and cover of size and colour as specified in the schedule including fixing.

3.2.02 MATERIAL: European type water closet shall be wash down pattern unless otherwise specified. Water closet shall be vitreous china conforming to IS 2556 (Part-I & II). The closet shall be of one piece construction and shall have minimum two hole of 6.5 mm diameter for fixing closet to floor. Closet shall have an integral flushing rims of self draining type. Each water closet shall have an integral trap with either 'S' or 'P' outlet with and trap shall be uniform and smooth in order to enable an efficient flush. Plastic seat and cover shall be of black colour or as specified, they shall have conformity to IS2548 Part 1 & II.

3.2.03 FIXING: The water closet pan shall be placed in position as shown in the drawing. If the pan trap is damaged during handling or fixing, it shall be replaced by the contractor at his own cost. The pan, soil pipe shall be jointed in 1:1 Cement Mortar with hemp yarn caulked. The gap between W.C. and floor shall be finished with white/matching cement and sand as directed. Seat and cover shall be fixed to the Pan by two corrosion resistance hinge with 65 mm shank and threaded to within 25 mm from flange. Seat shall be fixed in level by providing the washers of rubber with non ferrous or stainless steel washer to bolt.

3.3 WASH BASIN:

3.3.01 GENERAL: The item pertains for providing colour or white glazed vitreous china ware wash basin with or without pedestal of size and colour as specified in the schedule including fixing.

3.3.02 MATERIAL: Wash basins shall be of vitreous china conforming to IS : 2556(Part-IV) of flat back or angle back as specified shall be of one piece construction including combined over flow, basin shall be provided with single or double tap holes of size 28 mm square or 30 mm rounded. Each basin shall have circular waste hole, or 5 sq.cm slot type over flow. Pedestals for wash basin shall be exactly same glazing that of basin. Pedestal shall be capable of supporting the basin and completely recessed at the back to accommodate supply and waste pipes and fittings. The basin shall be supported on pan of C.I cantilever brackets conforming to IS 775. Use of MS angle or Tee Section as bracket is not permitted.

3.3.03 FIXING: The wash basin shall be fixed in position as indicated in the drawing. Basin shall be supported on a pair of C.I brackets which is embedded in cement concrete (1:2:4) block 100 x 75 x 150 mm. Oval shape or round shape wash basins are required to be fixed in RCC platform with stone tapping either fully sunk in stone top or flush with stone topping. The wall plaster on seat shall be cut to rest over the top edge of the basin so as not to leave any gap for water seepage through between wall plaster & skirting of basin. The gap between basin and wall shall be finished with white matching cement.

3.4 URINAL:

3.4.01 GENERAL: The item pertains for providing colour or white glazed vitreous china ware urinal in single or range (1,2 & 3) and size as specified in the schedule with necessary fittings and appliances including fixing.

3.4.02 MATERIAL:

3.4.02.1 BOWL TYPE (WITH FLUSHING RIM): Urinal basin shall be flat back or corner wall type lipped in front. The vitreous china conforming to IS 2556 (Part VI). Urinal shall have and integral flushing rim and inlet or supply horn for connecting flush pipe. Flushing rim and inlet shall be of the self draining type. At bottom of basin and outlet horn for connecting outlet shall be provided. The inside surface of the urinal shall be uniform and smooth throughout to ensure efficient flushing.

3.4.02.2 BOWL TYPE FLAT BACK WITHOUT FLUSHING RIM: They shall be of vitreous china conforming to IS:2556 (Part-VI) constructed in one piece with providing slot or alternative fixing arrangement at flat back and where the integral flushing rim is not provided, they shall be provided with ridges inside the bowl to divert towards the front line of the urinal.

3.4.02.3 STALL URINALS: The stall urinal and its screen shall be glazed fire day conforming IS :771 (Part-III, Sec-2). The inside surface of stall and screen shall be regular and smooth throughout to ensure efficient flushing.
3.4.02.4 CP BRASS FLUSH PIPE: The flushing arrangement to urinals for single or in range shall be of CP brass with CP brass spreader of 15 mm dia conforming to IS: 407. The capacity of flush pipe for urinal in a range shall be as follows:

<table>
<thead>
<tr>
<th>Nos. of urinals in range</th>
<th>Capacity of flush tank</th>
<th>Size of C.P. brass Flush pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Main</td>
</tr>
<tr>
<td>One</td>
<td>5 litres</td>
<td>15mm</td>
</tr>
<tr>
<td>Two</td>
<td>10 litres</td>
<td>20 mm</td>
</tr>
<tr>
<td>Three</td>
<td>10 litres</td>
<td>25 mm</td>
</tr>
</tbody>
</table>

3.4.03 FIXING:

3.4.03.1 BOAL TYPE FLAT BACK URINAL WITHOUT FLUSHING RIM (Single or Range): Urinal shall be fixed in position by using rawl plug, wooden plug, C.P screws etc. It shall be fixed at height of 65 cm from the standing level to the top of the lip of urinal or as directed by the Engineer-in-charge. Each urinal shall be connected with 32 mm size waste pipe which shall discharge into channel or a floor trap.

3.4.03.2 STALL URINALS: The lip of the stall urinal shall be flush with the finished floor level. The stall urinal shall be laid over a fine sand cushion on average 25 mm thickness. The gap between wall surface, finished floor level and urinals shall not be more than 3mm and filled with water proofing plastic compound.

3.4.03.3 CP BRASS FLUSHING ARRANGEMENT: The flushing arrangement to urinal in single or range shall be of CP brass from 25 mm dia to 15 mm dia and CP brass spreader of 15 mm size to each urinal including the cost of CP brass elbows, tees, coupling, crosses, clamps, clips, union CP brass check nut and screws etc. CP brass

3.5 URINAL SQUATTING PLATE:

3.5.01 Material: The squatting plates shall be of white vitreous china conforming to IS: 2556 (Part-I), IS: 2556 (Part-VI) with internal flushing rim with front or side inlet. Each squatting plat shall have integral longitudinal flush pipe. There shall be of 100 mm dia white glaze vitreous china channel with slope and outlet piece in front.

3.5.02 Fixing: The plate shall be fixed in position. The top edge of squatting plate shall be flush with the finished floor level adjacent to it. It shall be embedded on a layer of 25 mm thick cement mortar 1:6 laid over a bed of cement concrete 1:3:6. Gap between wall, floor etc. shall be finished with white/matching cement.

3.6 MARBLE/GRANITE PARTITION:

3.6.01 General: The item pertains for providing marble/granite partition of size and colour as specified in the schedule including fixing.

3.6.02 Material: The partition shall be of marble/granite slab of size & thickness as specified in the schedule. It shall be polished on both sides with exposed to proper shape the exposed edges of Marble/granite shall be made smooth corners rounded. Cracked or damaged marble/granite slab shall not be used in the work and shall be replaced if any by the contractor at his own cost and charges +/- 3mm tolerance shall be permissible for thickness of slab.

3.6.03 Fixing: Partition shall be fixed vertically in position as indicated in the drawing at proper height. 100 mm wide chases shall be cut in the wall and the partition shall embedded at least 50 mm in the wall using 1:2:4 cement concrete. After fixing the partition slab, the chases cut in the wall shall be made good to original condition.

3.7 DIVISION PLATE / PARTITION PLATE:

3.7.01 General: The item pertains for providing white or colour glazed vitreous chinaware division plate of size and colour as specified in the schedule including fixing.

3.7.02 Material: Division plate shall be white or colour glazed of size as specified in the schedule, and shall conform to IS: 2556 PART VI.

3.7.03 Fixing: Division plate shall be fixed vertically in position at proper height with expandable anchor fasteners, CP brass screws, wooden plugs etc.

3.8 HALF ROUND CHANNEL:

3.8.01 General: The item pertains for providing colour or white glazed vitreous chinaware half round
channel of size and colour as specified in the schedule including laying and fixing.

3.8.02 MATERIAL: The half round channel shall be of white or colour glazed vitreous chinaware of size as mentioned in the schedule with or without dead end and shall conform to IS 2556 part VII.

3.8.03 FIXING: The channel shall be laid to the correct alignment to required slope. It shall be fixed on 80 mm thick bed of 1:2:4 cement concrete. The channel shall be used in standard length. Pieces are not allow except where it is necessary to make up exact length. The joint and gap shall be finished with white / matching colour cement.

3.9 GLAZED FLOOR TRAP WITH DOME SHAPED GRATING:

3.9.01 GENERAL: The item pertains for providing white glazed vitreous chinaware floor trap with dome shaped C.P. Brass grating of size as specified in the schedule including fixing.

3.9.02 MATERIAL: The trap shape be of white vitreous chinaware of 100 mm dia. or as specified in the schedule with hinged type dome shaped grating of chromium plated brass or stainless steel as specified.

3.9.03 FIXING: The trap shall be laid to the correct alignment and to required slope. The trap shall be fixed on 80 mm thick bed or 1:2:4 cement concrete. The caulking shall be done using 1:1 cement concrete. The caulking shall be done using 1:1 cement mortar and hemp yarn.

3.10 TOILET PAPER ROLL HOLDER:

3.10.01 GENERAL: The item includes providing white or colour glazed vitreous chinaware toilet roll holder of size as mentioned in the schedule including fixing.

3.10.02 MATERIAL: The toilet paper roll holder shall be of CP brass or vitreous china on specified and of size and design as approved by the Engineer-in-charge. Toilet paper roll holder shall conform as per IS standard and should have ISI mark.

3.10.03 FIXING: Toilet paper roll holder shall be fixed in position by means of C.P brass covers and rawl plug embedded in the wall. Vitreous china toilet paper roll holder shall fixed into the wall with 1:2 cement mortar. The pocket shall be cut in wall for toilet paper roll holder if not left finishing the gap with white/matching cement.

3.11 PVC WATER INLET CONNECTION:

3.11.01 GENERAL: The item pertains to providing colour or white PVC water inlet connection for cistern and wash basins.

3.11.02 MATERIAL: PVC water inlet connection shall conform to IS specifications and shall be of standard pattern with nylon insulation of minimum 450 mm long with CP brass check nut at both the end and shall be able to withstand the testing pressure of 1 MPa (10 kg/sq.cm.)

3.11.03 FIXING: The PVC water inlet connection shall be fixed in position as indicated in the drawing or as directed by the Engineer-in-charge for flushing cistern and wash basins.

3.12 GLAZED FIRE-CLAY/VITREOUS CHINA SINK:

3.12.01 GENERAL: Item includes providing white or colour glazed -fire day sink for kitchen or vitreous china sink for lab as specified in the schedule of quantities including fixing.

3.12.02 MATERIAL: Laboratory sink shall be of vitreous china confirming to IS 2556 (PART-V) and kitchen sink shall be of glazed fire-clay conforming to IS 771 (Part-II) and shall have combined over flow of the weir type and invert shall be 30 mm below the top edge. These shall be of one piece construction and floor of sink shall gently slope towards the outlet. The outlet of sink should be suitable for waste fitting having flanges 88 mm diameter and waste hole of 65 mm diameter. The water hole shall be either rebated or beveled having the depth of 10 mm. C.I brackets for supporting sink shall confirm to IS: 775.

3.12.03 FIXING: The sink shall be supported on C.I cantilever brackets, embedded in cement concrete 1:2:4 block of size 100 x 75 x 150 mm. Bracket shall be fixed in the position before dado work is done. The height of front edge of sink from floor level shall be 80 cm or as directed by the Engineer-in-charge. The gap between floor/wall and sink shall finish with white cement.

3.13 STAINLESS STEEL SINK:

3.13.01 GENERAL: Item includes providing the stainless steel sink with or without drain board of size as specified in the schedule including fixing.

3.13.02 MATERIAL: The sink shall be manufactured from stainless steel of Salem or equivalent steel conforming to IS: 13983. Stainless steel sink shall be of one piece construction moulded out of 19 SWG (1mm) stainless steel sheet of grade AISI 304 (18/8) with stainless steel choke – stop strainer (waste
3.13.03 **FIXING**: The sink shall be fixed in position as indicated in the drawing. The sink shall be placed over the brackets or on the platform. Gap between sink and platform / wall shall be finished with white / matching cement.

3.14 **SINK DRAIN BOARD**:
3.14.01 **GENERAL**: The item includes providing white or colour glazed / fire clay drain board of size mentioned in the schedule fixing.
3.14.02 **MATERIAL**: The drain board shall be manufactured from stainless steel of Salem or equivalent steel conforming to IS: 13983. Stainless steel sink shall be of one piece construction and its thickness not less than 1 mm.
3.14.03 **FIXING**: The drain board shall be fixed in the position as indicated in the drawing. It shall be place over the brackets or on the platform. Gap between board and platform / wall shall be finished with white / matching cement.

3.15 **SOAP DISH**:
3.15.01 **GENERAL**: The item includes providing white or colour glazed chinaware type soap dish of size as mentioned in the schedule including fixing.
3.15.02 **MATERIAL**: Soap Dish shall be of C.P brass or vitreous China on specified and of size, design an approved by the Engineer-in-charge. Soap Dish shall conform to relevant IS standard and should have ISI certification mark.
3.15.03 **FIXING**: Soap Dish shall be fixed in position by means of C.P brass covers and rawl plug embedded in the wall. Vitreous china Soap Dish shall fixed into the wall with 1:2 cement mortar. The pocket shall be cut in wall, if not left, finishing the gap with white/matching cement.

3.16 **GLASS MIRROR**:
3.16.01 **GENERAL**: The item providing beveled or plain edges mirror with or without frame of size as mentioned in the schedule including fixing.
3.16.02 **MATERIAL**: The mirror shall be of superior sheet glass with edges rounded off or beveled, size 600 x 450 mm unless specified in the schedule. It shall be free from flaws, specks or bubbles and thickness plated and should not be less than 5.0 mm. The back of mirror shall be uniformly silver plated and should be free from silkening defects. Silkening shall now have a protective uniform covering of red lid paint, where beveled edge mirror are not available. Fancy looking mirrors with PVC edging/marble or aluminum beading on stainless steel beading/border based on manufacturer’s specification, provided nothing extra shall be paid on this account. The backing of mirror shall be provided with 6mm thick marine plywood or environmentally friendly material other than asbestos cement sheet.
3.16.03 **FIXING**: Mirror shall be fixed in position with 6mm thick marine ply wood backing. It shall be fixed by means of 4 nos. of CP brass screws & caps over rubber washers and rawl plug or as per the manufacturer’s specification unless specified otherwise the longer side shall be fixed horizontally.

3.17 **GLASS SHELF**:
3.17.01 **GENERAL**: The item includes providing glass shelf of size as mentioned in the schedule including fixing.
3.17.02 **MATERIAL**: Glass shelf shall consist of an assembly of glass shelf frame of size 600 x 125 mm or as specified in the schedule. It shall be with a pair of CP Brass brackets fixed to the wall with CP screws and CP brass rails around with guard bar of 6 mm diameter fixed to the glass shelf frame with five numbers CP brass brackets. The glass shall not be less than 5 mm thick. PVC stainless steel shelf or as per manufacturer’s specification and size as specified in the schedule of work shall be provided.
3.17.03 **FIXING**: The complete accessories shall be fixed to proper line and level as indicated in drawing with 40 mm long CP brass screws, wooden rawl plug, drilling hole and making good the wall to original condition after fixing the glass shelf.

3.18 **LIQUID SOAP DISPENSER**:
3.18.01 **GENERAL**: The item includes prdg. CP liquid soap dispenser of shape as mentioned in the schedule including fixing.
3.18.02 **MATERIAL**: Liquid Soap Dispenser shall be of C.P brass of heavy quality and from list of
approved make.

3.18.03 FIXING: The liquid soap dispenser shall be fixed to proper height and level as indicated in drawing with 40 mm long CP brass screws, wooden rawl plug, drilling hole etc. and making good the wall to original condition after fixing.

3.19 TOWEL ROD/TOWEL RING:
3.19.01 GENERAL: The item includes providing Towel rod / towel ring of size as mentioned in the schedule including fixing.
3.19.02 MATERIAL: Towel ring shall be of C.P brass with two CP brass bracket coated with chromium plating of thickness not less than grade No.2 of IS 4827. The size of rail shall be 600 mm x 20 mm dia unless otherwise specified in the schedule. Towel ring of CP brass with one CP brass bracket with thickness not less than Grade No.2 of IS 4827. The diameter of the ring shall be 175 mm unless otherwise specified in the schedule. The diameter of ring rod shall not be less than 8 mm.
3.19.03 FIXING: The towel rod/ ring shall be fixed to proper line and level as indicated in drawing with CP brass screws, wooden rawl plug, drilling hole etc. and making good the wall to original condition after fixing the towel rod.

3.20 SHOWER ROSE:
3.20.01 GENERAL: The item pertains to provide chromium plated brass shower rose of specified diameter with accessories including fixing.
3.20.02 MATERIAL: The shower rose shall be CP brass of approved and heavy quality. It's accessories shall conform to IS 1239 Part II.
3.20.03 FIXING: Shower rose shall be fixed to be water supply pipe line with necessary G.I fittings etc. as required by the Engineer-in-charge. Jointing shall be done with the zinc, spun yarn etc. A few turns of fine hemp yarn dipped in linseed oil shall be taken over the threaded ends to obtain complete water tightness. Leaky joint shall be remade to make it leak proof at his risk & cost.

3.21 BIB TAP, STOP COCK & ANGLE STOP COCKS:
3.21.01 GENERAL: The item pertains to provide chromium plated brass bib tap and stop cock and angle stop cocks, free flanges (if joined to concealed pipe) including fixing.
3.21.02 MATERIAL: Bib cock (Bib tap) is drawn off tap with a horizontal inlet and free outlet and a stop cock is a valve with a suitable means of connections for insertion in a pipe line for controlling or stopping the flow. These shall be of size 15 mm size or as specified and shall be of screw down type. The closing device shall work by means of disc, carrying a renewable non-metallic washer with shuts against the water pressure on a seating tight angles to the axis of the threaded spindle which operates it. The handle shall be crutch, butterfly or fancy design type securely fixed to the spindle. The tap shall open anti clockwise direction. Brass bib taps and stop cocks and angle stop cocks shall conform to IS 781, they shall be polished bright. The minimum finished weight of different sizes of bib tap weight of 15 mm size bib tap and stop cock shall be as per table given below. They shall be sound and free from taps, blow hole and fitting. Internal & External surface shall be clean, smooth and free from sand and neatly dressed. Taps shall be nickel chromium plated and thickness of coating shall not be less than service grade No.2 of IS 4827 and plating shall be capable of taking high polish which shall not be easily tarnished.

| MINIMUM FINISHED MASS OF BIB TAPS AND STOP VALVES AS PER IS 781:1984 (Reaffirmed 2001) |
|---|---|---|---|---|
| Size | Minimum Finished Mass |
|---|---|---|---|---|
| bib taps | Stop Valves |
| Internally threaded | Externally threaded | Mixed end |
| Mm | Kg | Kg | Kg | Kg |
| 8 | 0.250 | 0.220 | 0.250 | 0.225 |
| 10 | 0.330 | 0.330 | 0.350 | 0.325 |
| 15 | 0.400 | 0.330 | 0.400 | 0.365 |
| 20 | 0.750 | 0.675 | 0.750 | 0.710 |
| 25 | 1.250 | 1.180 | 1.300 | 1.250 |
| 32 | - | 1.680 | 1.800 | 1.750 |
Every tap complete with its component shall withstand an internally applied hydraulic pressure of 2 MPa (20 kg/sq.cm) maintained for a period of 2 minutes during which period it shall neither leak nor sweat. Leaky joint shall be remade to make it leak proof without any extra cost from contractor.

### 3.21.04 FIXING

Bib tap stop cock shall be fixed to the pipe line with C.P. brass or G.I. specials, if required or as ordered by Engineer-in-charge. Jointing shall be done with white zinc, spun yarn etc. A few turns of fine hemp yam dipped in linseed oil shall be taken over the threaded ends to obtain complete water tightness.

### 3.21 COMBINATION TAP ASSEMBLY (WALL / PILLAR MOUNTED):

#### 3.21.01 GENERAL

The item pertains to provide chromium plated brass combination tap assembly, wall mounted hot & cold mixing for bath, pillar mounted hot & cold mixing for sink, basin, tub etc. including free flanges and fixing.

#### 3.21.02 MATERIAL

The combination tap assembly shall be 15 mm nominal size or as specified in the schedule. It shall be of C.P. brass approved and heavy quality, and shall conform to I.S. 8931. Combination tap assembly shall be chromium plated-brass and shall conform to IS 8931. The nominal size of combination tap assembly shall be 15 mm nominal size or as specified. Casting of combination tap assembly shall be sound and free from laps, blow hole and pitting. External and internal surface shall be clean, smooth and free from sand and be neatly dressed. All the parts fitted to pillar tap shall be axial, parallel and cylindrical with surfaces smoothly finished. Thickness of C.P coating shall not be less than service grade no.2 of IS 4827 and plating should be capable of taking high polish which shall not easily tarnish or scale.

#### 3.21.03 TESTING

Combination tap assembly shall withstand and internally applied hydraulic pressure of 1.6 Mpa (16 kg/ sq.cm) for period of 1 minutes during which, it shall neither leak nor sweat. Leaky joint shall be remade to make it leak proof.

#### 3.21.04 FIXING

Combination tap assembly shall be fixed to the pipe line as indicated in the drawing with necessary special as required or as ordered by Engineer-in-charge. Jointing shall be done with white zinc, spun yarn etc. A few turns of fine hemp yam dipped in linseed oil shall be taken over the threaded ends to obtain complete water tightness.

### 3.22 PILLAR TAP: (Non fancy & Fancy Type)

#### 3.22.01 GENERAL

The item pertains to provide chromium plated brass pillar tap including fixing.

#### 3.22.02 MATERIAL

The pillar tap shall be 15 mm nominal size or as specified in the schedule. Fancy type pillar tap shall be of C.P. brass approved quality and shall conform to I.S. 8931. Non fancy pillar tap shall be chromium plated-brass and shall conform to IS 1795. The nominal size of Pillar tap shall be 15 mm or as specified.

Casting of Pillar tap shall be sound and free from laps, blow hole and pitting. External and internal surface shall be clean, smooth and free from sand and be neatly dressed. All the parts fitted to pillar tap shall be axial, parallel and cylindrical with surfaces smoothly finished. The minimum of finish weight of Pillar tap shall not be less than 650 grams (body weight 250 gms, washer plate loose valve 150 gms and back nut 40 gms). Thickness of C.P coating shall not be less than service grade no.2 of IS 4827 and plating should be capable of taking high polish which shall not easily tarnish or scale.

#### 3.22.03 TESTING

Pillar tap shall withstand and internally applied hydraulic pressure of 2 MPa (20 kg/sq.cm) for period of 2 minutes during which period, it shall neither leak nor sweat. Leaky joint shall be remade to make it leak proof without any extra cost from the contractor.

#### 3.22.04 FIXING

Pillar tap shall be fixed to the pipe line as indicated in the drawing with necessary special as required or as ordered by Engineer-in-charge. Jointing shall be done with white zinc, spun yarn etc. A few turns of fine hemp yam dipped in linseed oil shall be taken over the threaded ends to obtain complete water tightness.

### 3.23 FLUSH VALVE:

#### 3.23.01 GENERAL

The items pertains to provide chromium plated brass flush valve or brass concealed type flush valve with necessary accessories including fixing. (Free flanges if joined to concealed pipes)

#### 3.23.02 MATERIAL

The fresh valve shall be nominal diameter as specified in the schedule of quantities. It shall be of C.P. brass approved and heavy quality, and shall conform to I.S. 9758. The fresh valve shall have working pressure of 0.15 to 0.5 MPa. The valve shall be tested to a Hydraulic pressure of
3.24.03 FIXING: Flush value shall be fixed to the pipe line as indicated in the drawing with necessary special as required or as ordered by Engineer-in-charge. Jointing shall be done with white zinc, sun yarn etc. A few turns of fine hemp yeast dipped in linseed oil shall be taken over the threaded ends to obtain complete water tightness. Leaky joint shall be remade to make it leak proof.

3.25 BATH TUB (Enamelled steel sheet):
3.25.1 GENERAL: Item includes providing sheet steel bath tub of size and without side panel as specified in the schedule of quantities including fixing or placing.

3.25.2 MATERIAL: The bath tub shall conform to IS 3489. The bath tub shall be constructed of the fewest practicable number of sections which shall be such as to ensure a suitable finished surface for the reception of the enamel coating. Any welded surface shall be adequately cleaned off inside and outside the bath tub. The necessary surface shall be free from undulations, drawing line and other defects deleterious to the provision of a satisfactory enamel coating.

The interiors of the bath tub shall be adequately and evenly coated with vitreous enamel. The enamelling shall conform to IS : 772. Thickness of the enamel shall not be less than 0.2 mm and not more than 0.5 mm. External surface of the bath tub shall be given one ground or primer enamel coating. Gloss, colour & opacity shall be uniform and visually satisfactory. The finish shall be free from crazing, dimples, rundown sagging fillers not more than two in number on the interior surface, pinholes not more than two in number for coloured bath tubs and not more than four for white enamelled bath tubs, specks shall be less than one mm in size and max. five in number and there shall be no grouping of pinholes and specks. Warpage of edges set against wall or floor and edges of roll rims shall not exceed 5 mm/m., warpage of all other edges shall not exceed 7.5 mm/m.

In forming the roll the outer edges shall be flanged or rolled back underneath sufficiently to prevent exposure of sharp edges. The vertical height of the flanged or rolled edges shall be not more than 30 mm. At the tap end of the roll, there shall be a level area within a radius of at least 25 mm from the centre of each tap hole.

3.25.3 FIXING: The bath tubs shall be as flat bottomed as practicable. The fall (slope) long the bottom head end to outlet shall be adequate for complete emptying. The waste hole shall be so formed as to be suitable for receiving 40 mm waste fitting. The bath tubs shall be provided at the tap end, with effective means of attaching an earth continuity conductor. With each bath tub, two spacing washers of suitable thickness to take up the difference between the thickness of the metal of the bath tub and the depth of the seating on pillar taps shall be supplied. In addition, two fibre or lead washers for each tap shall be supplied for fitting above and below the tap roll to prevent the enamel from erasing when the taps are tightened in position.

3.26 BATH TUB: (Gel coated G.R.P. resin)
3.26.1 GENERAL: Item includes providing gel coated glass fibre reinforced polyester resin bath tub of size and with or without panel as specified in the schedule of quantities including fixing or placing.

3.26.2 MATERIAL: The bath tub shall conform to IS 6411. The fibre glass used in the manufacture of bath tubs shall be non alkaline conforming to 'E' type or 'A' type Grade. The proportion of the glass fibre shall not be less than 25% of the glass fibre reinforced polyester layer including gel coated layer. Unsaturated polyester resin used in the manufacture of bath tubs shall be resistant to not water and weathering. When filler and colouring materials are used, their quality and proportion should be compatible to the polyester and the materials shall not have any harmful effect on the quality and performance of bath tubs. The bath tub shall possess a uniform gel-coat on the working surface. The resin used in the gel-coat shall be isophthalic grade of polyester or epoxy resin or any equally suitable chemical resistant grade of resin. The gel-coat shall not be less than 0.25 mm thickness nor more than 1.00 mm thickness.

In forming the roll, the outer edges shall be flanged or rolled back underneath sufficiently to prevent exposure of sharp edges. The vertical height of the flanged or rolled edges shall be not more than 30 mm. At the tap end of the roll, there shall be a level area within a radius of at least 25 mm from the centre of each tap hole.

3.26.3 FIXING: The bath tub shall be one piece unit with an opening for waste outlet with floor sloping towards the outlet. An overflow shall normally be provided on the side near the waste outlet. An apron (side panel) may be provided, integrally or separately with the bath tub as specified in schedule of quantities. The waste opening shall be suitable for the proper installation of waste fittings which are ordinarily used for the purpose. The bath tub shall be provided with a supporting structure integral to the unit in between the space between the bottom of the bath tub and the floor of the building on which the bath tub rests unless otherwise specified. The materials of the supporting structure shall be at least equal to the material of the bath tub in resistance to deterioration with age and shall meet the requirement of fungus and vermin.
3.27 WASTE COUPLING:
3.27.01 GENERAL: The item pertains to provide chromium plated brass waste coupling including fixing.
3.27.02 MATERIAL: Waste Coupling shall confirm to IS 3311. Waste fittings shall be of CP with thickness of CP coating not less than service Grade No.2 of IS 4827 which is capable of receiving polish and will not easily scale off. The fitting shall conform in all respect to IS 2963 and shall sound, free from laps below, holes and fittings and other manufacturing defects. External and internal surface shall be clean and smooth. They shall be neatly dressed. The waste fitting for wash basin shall be of nominal size of 32 mm and for sink shall be nominal size 50 mm.
3.27.03 FIXING: Waste coupling shall be fixed to wash basin, sink or urinal as ordered with necessary specials. Jointing shall be done with white zinc, yarn etc. A few turns of fine hemp yarn dipped in linsseed oil shall be taken over the threaded ends to obtain complete water tightness. Leaky joint shall be remade to make it leak proof.

3.28 BOTTLE TRAP:
3.28.01 GENERAL: The item pertains to provide chromium plated brass bottle trap including fixing.
3.28.02 MATERIAL: Bottle trap shall be of CP with thickness of CP coating not less than service grade No.2 of IS 4827 which is capable of receiving polish and will not easily scale off. The fitting shall conform in all respect of IS 2963 and shall sound, free from laps below, holes and fittings and other manufacturing defects. External and internal surface shall be clean and smooth. They shall be neatly dressed and be truly machined so that nut smoothly moves on the body. The Bottle trap for wash basin shall be of nominal size of 32 mm and for sink shall be nominal size 50 mm.
3.28.03 FIXING: Bottle trap shall be fixed to wash basin, sink or urinal as indicated in the drawing with necessary specials or as ordered by the Engineer-in-charge. Jointing shall be done with white zinc, spun yarn etc. A few turns of fine hemp yarn dipped in linsseed oil shall be taken over the threaded ends to obtain complete water tightness. Leaky joint shall be remade to make it leak proof.

3.29 COAT AND HAT HOOK:
3.29.01 GENERAL: The item pertains to provide chromium plated brass coat and hat hook including fixing.
3.29.02 MATERIAL: Coat & Hook shall be of three way type of approved and heavy quality. Coat & Hat Hook shall be CP brass and three way hook type or minimum six way pattie type of 125 mm x 30 mm x 6 mm size. CP coating shall not be less than service grade No.2 of IS 4827.
3.29.03 FIXING: The Coat and hat hook shall be fixed to proper line & level as indicated in drawing with CP brass screws.

3.30 FLUSHING CISTERN:
3.30.01 GENERAL: The item pertains to provide white or colour glazed chinaware / PVC / Cast Iron flushing cistern with all inside syphonic fitting including fixing.
3.30.02 MATERIAL: The flushing cistern shall be automatic or manually of rates high level or low level as specified for water dosets and urinals.
Cisterns shall be of cast iron, vitreous china, enameled pressed steel conforming to IS 774 for Flushing Type and IS 2326 for Automatic flushing cistern and Plastic (IS 7231). Cistern shall be mosquito proof. All working parts shall be designed to operate smoothly and efficiently. the cistern shall have removable covers which shall fit closely on it and be screwed against top displacement where operating mechanism is attached to the cover. This may be made in two section, but the section supporting the mechanism shall be securely fitted or screwed to the body. The outlet fitting of the cistern shall be securely connected to the cistern. The nominal internal diameter of the cistern outlet shall not be less than 32 mm and 38 mm for high level and low level respectively. Length of outlet cistern shall be 37 +/ - 2 mm. Ball valve shall be screwed type 15 mm in diameter and shall confirm of IS 1703. The flat shall be made of polyethylene as specified in IS 9762. A high level cistern is intended to operate with minimum height of 125 cm and a low level cistern with maximum height of 30 cm between the top of the pan and under side of the cistern. A G.I chain strong enough to sustain a sudden applied pull of 10 kg or a dead load of 50 kg without any apparent or permanent deformation of the chain rings shall be attached to the ring or hook of the level manually operated high level C.I cistern. In case of low level cistern handle shall be of CP brass. In case of Plastic cistern, operation of cistern shall be through Push Button at the top for dual system and beyond plastic handle.
The discharge rate of the cistern as per IS 774 shall be 10 +/- .5 litres 6 second and 5 +/- .5 litres in 3 second for cistern capacity 10 ltrs. and 5 ltrs. respectively. Flush pipe shall be of class 'B' G.I pipe of 32 +/- mm diameter for high level. Polyethylene flush pipe shall be low density conforming to IS 3076 or high density conforming to IS 4984 or UPVC pipe conforming to IS 4965 of 40 mm outer diameter.

Over flow pipe shall not be less than +/- 5mm 'B' diameter. It shall be of G.I valve with mosquito proof jalli of 1.25 mm dia.

3.3.03 FIXING: The chinaware flushing cistern shall be placed over a pair of C.I. brackets. C.P. brass flush pipe shall be fixed to cistern and W.C. pan using check nut, spun yarn, cement mortar etc.

The cast iron flushing cistern shall be placed over a pair of C.I. or G.I. or PVC flush pipe of specified diameter shall be fixed to cistern and W.C. pan by using check nut, white zinc, spun yarn, cement mortar etc.

The PVC flushing cistern shall be placed or fixed as recommended by the manufacturer, PVC flush pipe of specified diameter shall be fixed to cistern and W.C. pan by using check nut, white zinc, spun yarn, cement mortar etc.

3.31 BRACKET:
3.31.01 GENERAL: The item pertains to provide a pair of bracket for wash basin, sink, Flushing, cistern etc. including fixing.
3.31.02 GENERAL: The item pertains to provide a pair of bracket for wash basin, sink, cistern etc, including fixing.
3.31.03 FIXING: Brackets shall be embedded into or fixed to the wall with plugs, screws, nails etc. Hole shall be made in the wall, if they are not left for fixing the brackets and shall be made good after fixing. The gap shall be filled with 1:2 cement mortar and finishing shall be done with white / matching colour cement.

4.0 : WATER SUPPLY SYSTEM:
4.1 G.I. PIPING WORK (Exposed):
4.1.01 GENERAL: The item includes provision of G.I. pipes with G.I. fitting of specified nom. bore and class as mentioned in the schedule including laying, fixing. The G.I. pipes and fittings shall run on the surface of the walls or ceilings unless otherwise specified.
4.1.02 MATERIAL: The pipes and fittings shall be of M.S. galvanised as specified in the schedule. They shall conform to IS 1239 (P-I). All the pipes and fitting shall have ISI certification mark. The specified nominal bore of the pipe shall refer to inside approximate bore according to the thickness corresponding to outside fixed diameter. The pipe and fittings shall be smooth, sound, free from any imperfections and neatly dressed. The pipe and fitting shall be able to withstand a hydrostatic test pressure of 5 MPa (50 Kg/cm2) maintained for at least 3 seconds at manufacturing works (lab test). The table showing the dimensions and different bores of pipes are given below.

WEIGHT OF GALVANISED & BLACK (BOTH) M.S. TUBES FOR ORDINARY USES IN WATER

<table>
<thead>
<tr>
<th>Nominal Bore</th>
<th>Class</th>
<th>Outside Diameter Maximum</th>
<th>Minimum Wall thickness in mm</th>
<th>Nominal Weight (Kg/M)</th>
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<tr>
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<td></td>
<td>Mm</td>
<td>Mm</td>
<td>Nominal Weight (Kg/M)</td>
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<td>27.3</td>
<td>26.5</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>27.3</td>
<td>26.5</td>
<td>3.2</td>
</tr>
<tr>
<td>25</td>
<td>L</td>
<td>33.8</td>
<td>33.2</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>34.2</td>
<td>33.3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>34.2</td>
<td>33.3</td>
<td>4.0</td>
</tr>
<tr>
<td>32</td>
<td>L</td>
<td>42.5</td>
<td>41.9</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>42.9</td>
<td>42.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Mark</td>
<td>Class</td>
<td>Colour Code</td>
<td>THICKNESS</td>
<td>Weight</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>-------------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>For Single Tube</td>
<td>For 10 tones load</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(+)</td>
<td>(-)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(+)</td>
<td>(-)</td>
</tr>
<tr>
<td>L</td>
<td>“Light” class</td>
<td>Yellow Band</td>
<td>Not limited</td>
<td>8.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.0%</td>
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<td>8.0%</td>
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<td></td>
<td>7.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.0%</td>
</tr>
<tr>
<td>M</td>
<td>“Medium” class</td>
<td>Blue Band</td>
<td>Not limited</td>
<td>10.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.0%</td>
</tr>
<tr>
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<td>10.0%</td>
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<td></td>
<td>7.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td>H</td>
<td>“Heavy” class</td>
<td>Red Band</td>
<td>Not limited</td>
<td>10.0%</td>
</tr>
<tr>
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<td>10.0%</td>
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<td></td>
<td></td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Random length of tube:- unless otherwise specified 4.0 to 7.0 m includes one socket for screwed & socketed tubes

COATING:- Zinc coating as per IS 4736 (latest revision)

4.1.03 LAYING : The plumbing contractor shall set the layout of the plumbing approved by the Engineer-in-charge as may be required by the bye-laws. Pipes shall be laid in plumb and in straight and parallel lines. When unavoidable, pipes may be buried for short distances provided additional protection is given against damage and where so required joints are not buried. Where directed by the Engineer-in-charge, A M.S. tube sleeve shall be fixed at a place the pipe is passing through a wall or floor for reception of the pipe and to allow freedom for expansion, contraction and other movements. In case the pipe is embedded in walls or floors the pipes shall be painted with anticorrosive bituminous paints of approved quality. The pipe shall not come in contact with mortar or lime concrete as the pipe is affected by lime. Under the floors the pipe shall be laid in layer of sand filling as done under concrete floors.

4.1.04 FIXING : The entire pipe line shall be fixed in position as shown in the drawing or as directed by the Engineer-in-charge. All pipes shall be fixed truly vertical and horizontal unless unavoidable. The pipe line shall be supported with “U” type G.I. clamps not less than 2 mm thick and G.I. nails not less than 40 mm long, wooden gutties etc keeping the pipe about 15 mm clear of the wall.

Spacing between clamps for fixing internal piping shall be as per IS 2065 – 1983 as given below:

<table>
<thead>
<tr>
<th>Nom. bore of pipe</th>
<th>For Horizontal Runs</th>
<th>For Vertical Runs</th>
</tr>
</thead>
<tbody>
<tr>
<td>15mm</td>
<td>2.0 M</td>
<td>2.5 M</td>
</tr>
<tr>
<td>20 mm to 32 mm</td>
<td>2.5 M</td>
<td>3.0 M</td>
</tr>
<tr>
<td>40 mm to 50 mm</td>
<td>3.0 M</td>
<td>3.5 M</td>
</tr>
<tr>
<td>65 mm to 80 mm</td>
<td>3.5 M</td>
<td>5.0 M</td>
</tr>
</tbody>
</table>
No joints shall be located inside the wall. If the pipe is required to be cut and the end threaded, the hums of the cut end shall be filed smooth and any obstruction in bore shall be entirely eliminated, downtake line shall be provided with union of every floor for easy maintenance. This shall be made of line threaded pipe ends and coupler with check nut to avoid leakage. Die cast union shall not be permitted in the shaft.

4.1.05 JOINTING : While fixing the pipe line the joints shall be made by applying a few turns of hemp yarn dipped in linseed oil shall be taken over the threaded end of the pipe and socket screwed home using the pipe wrench, pipe connected shall touch each other and the socket covering each end about equally. The branch connection shall not protrude in the bore of parent pipe.

4.1.06 PAINTING : G.I. pipes and fittings running exposed shall be painted with two coats of oil paint of approved make and shade over a coat of approved primer.

4.1.07 TESTING : The pipes and fittings after they are laid and jointed shall be tested to hydraulic pressure of 1 MPa (10 Kg/sq.cm). The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw off taps and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually. Pressure gauge must be accurate and preferably should have been recalibrated before the test. The test pump having been stopped, the test pressure should be maintained without loss for at least 2 (two) hours. The pipes and fittings shall be tested in sections as the work of paying proceeds, having the joints exposed for inspection during the testing. Pipes or fittings which are found leaking shall be replaced and joints found leaking shall be redone, without extra payment.

4.2 G.I. PIPING WORK (Concealed):

4.2.01 GENERAL : The item includes provision of G.I. pipes with concealed type fittings of specified nom. bore and class mentioned in the schedule including laying, fixing, wrapping with hessian cloth, painting and testing.

4.2.02 MATERIAL : Please refer clause 4.1.02

4.2.03 CHASES : Chases of size 75 mm x 75 mm shall be cut in the wall, floor, slab wherever required or as directed by chases cutting machine. After testing the pipe line the chases shall be filled with cement mortar 1:3 and surface made good to its original condition.

4.2.04 LAYING : The plumbing contractor shall set the layout of the plumbing approved by the Engineer-in-charge as may be required by the bye-laws. Pipes shall be laid in plumb and in straight and parallel lines. No lime plaster or composition containing lime shall be allowed to come in direct contact with the pipe, which are to be concealed as the pipe is affected by lime.

4.2.05 FIXING : The entire pipe line shall be fixed in position as shown in the drawing or as directed by the Engineer-in-charge. All pipes and fittings, which are to be concealed, shall be properly embedded in the wall, flooring etc. after being treated. No moulding or plaster design or any ornamental plaster work shall be done over the walls or flooring or ceiling where concealed pipes have been laid.

If the pipe is required to be cut and the end threaded, the burns of the cut end shall be filed smooth and any obstruction in bore shall be entirely eliminated.

4.2.06 JOINTING : Please refer Clause No. 4.1.05

4.2.07 PAINTING : All the concealed piping work shall be thoroughly painted with two coats of anti-corrosive black bitumastic paint of approved quality shade over a coat of approved primer before concealing and filling the mortar.

4.2.08 INSULATION : The hot water pipe line concealed on the wall, floor etc. after painting shall be insulated with 2.5 mm thick 95% asbestos magnesia compound of approved make all round the pipe and fittings.

4.2.09 WRAPPING : After painting the cold water pipe line, it shall be wrapped with two layers of hessian doth of approved quality.

4.2.10 TESTING : Please refer clause No.4.1.07

4.3 UNDER GROUND G.I. PIPING WORK :

4.3.01 GENERAL : The item includes supplying G.I. pipes and fittings of specified nom. bore and class as mentioned in the schedule including laying, jointing and painting.

4.3.02 MATERIAL : Please refer clause 4.1.02

4.3.03 TRENCHES : The galvanized iron pipes and fittings are to be laid in trenches. The widths and depths of the trenches for different diameter of the pipes shall be as given below:
### Diameter of pipe (mm)  
<table>
<thead>
<tr>
<th>Min. Width of trench (mm)</th>
<th>Min. Depth of trench (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 to 50</td>
<td>300</td>
</tr>
<tr>
<td>65 to 100</td>
<td>450</td>
</tr>
</tbody>
</table>

When excavation is done in rock, it shall be cut deep enough to permit the pipes to be laid on a cushion of sand of min. 7.5 cm. At joints the trench width shall be widened where necessary. The work of excavation and refilling shall be done true to line and gradient in accordance with general specifications for earth work in trenches as per clause 2.0.

### 4.3.04 LAYING

Where a pipe is to be laid under ground, the particular length of pipe should be protected by first painting before laying and then wrapping around the pipe a layer of jute or hessian cloth in the form of bandage, so that this cloth in the form of bandage, stick to the composition which has been freshly applied.

The pipe shall be laid into the trench and screwed with sockets, elbows, tees, bends etc. as necessary. The pipe line laid near electric train lines, power transmission lines, electric railway, power houses etc. should be provided with insulating joints at frequent intervals to guard against electrolysis. Pipes shall be so laid as not to expose to sun or be subjected to any injury or risk to the pipe. As far as possible pipes shall be laid in straight and parallel lines. They shall be used in standard length pipe pieces being used only where necessary to make up the exact length.

### 4.3.05 JOINTING

Refer clause No. 4.1.05

### 4.3.06 DEWATERING

The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

### 4.3.07 TESTING

Same as clause 4.1.07

### 4.3.08 PAINTING

G.I. pipes and fittings shall be painted with two coat of anticorrosive paint before pipe line is laid and wrapping the pipe and fitting with jute or hessian cloth in the form of bandage.

### 4.4 HIGH DENSITY POLYETHYLENE PIPING WORK FOR WATER SUPPLY

#### 4.4.01 GENERAL

The item includes supplying of HDPE pipes with fittings of specified diameter including laying, fixing, cutting, jointing.

#### 4.4.02 MATERIAL

The pipes and fittings shall conform to series IV of IS 4984. HDPE pipes and fittings shall be free from cracks, flaws and defects and shall be able to withstand a pressure as mentioned in the schedule.

#### 4.4.03 EXAMINING

Before laying the pipe line, if shall be first examined for damages and cracks, No cracked or damaged pipe and fittings shall be used in the work and they shall be removed from the site by the contractor at his own cost and charge.

#### 4.4.04 LAYING

The pipes shall be carefully laid straight to the correct alignment in gradients as indicated in the drawing. All the pipe shall be used in standard length as far as possible. Cut length may be used only where it is necessary to make up exact length.

The entire length of pipe shall be evenly supported on bed of the trench throughout. Care shall be taken to prevent any sand, earth or other materials from entering into the pipes during laying. At the end of day’s work the open end shall be suitably plugged.

#### 4.4.05 FIXING

The pipe line shall be fixed in position as shown in the drawing or as directed by the Engineer-in-charge. The pipe shall be fixed with G.I. clamps not less than 2 mm thick or with suitable diameter HDPE clamps. The clamps shall be fixed into the wall with M.S. nails not less than 40 mm long/Wooden gutties etc. chromium plated screws with wooden gutties fixing the pipe line on internal wall surface.

#### 4.4.06 MAKING JOINT

The joining of pipes and fittings generally shall be done by Butt weld with heat mirror jointing. The pipe shall be cut to desired length, Care shall be taken that profile of cut surfaces is not changed and the fibrous material shall be removed with scraper or knife. The butt weld jointing shall be made with electrical heated plated at the required temperature around 205, + or - 5 degree Centigrade. While jointing, care shall be taken that formation of the rim at end of pipe after heating by hot plate should be made uniform and complete on both the ends. Holding and pressing of pipe is done manually or mechanically to give the leak proof joint.

#### 4.4.07 DETACHABLE JOINT

Detachable joints shall be made where pipes of different materials have to be jointed or as specified in the schedule. The flanges are first pushed over the pipe ends and a rim is made by heating the pipe end in a suitable device to 70-180 Centigrade and welding pre-heated rim of the pipe.

#### 4.4.08 DEWATERING

In case of underground pipes, the contract rate shall include bailing or pumping out all the water till completion of work if accumulated during the progress of work either from seepage,
4.4.09 TESTING: Solvent welded pipe shall not be pressure tested until at least 24 hours after the last solvent cemented joint has been done. All control valves shall be positioned open for the duration of the test and open end closed with water tight fittings. The testing pressure on completion of the work shall not be less than 1.5 times the working pressure of the pipes.

Pressure shall be applied either by hand pump or power driven pump. Pressure guages shall be correctly positioned and closely observed to ensure that at no time are the test pressure exceeded. The systems shall be slowly and carefully filled with water to avoid surge pressure or water hammer. Air vents shall be open at all high points so that air may be expelled from the system during filling.

When the system has been fully charged with water and air displaced from the line air vent shall be closed and the line initially inspected for seepage at joints and firmness of supports under load. Pressure is reached. Without any additional requirement of make-up-water the test pressure should not fall more than 0.02 MPa (0.2 kg./sq.cm) at the end of one hour test duration.

4.5 PVC PIPING WORK FOR WATER SUPPLY:
4.5.01 GENERAL: The item includes supplying of PVC pipes with fittings of specified diameter including laying, fixing, cutting, joining, painting etc. for vent, over flow, waste water pipe line etc.

4.5.02 MATERIAL: The pipes and fittings shall conform to series IV of IS 4985-1978, PVC pipes and fittings shall be free from cracks, flaws and defects and shall be able to withstand a pressure as mentioned in the schedule of quantities.

4.5.03 EXAMINING: Before laying the pipe line, it shall be first examined for damages and cracks, No cracked or damaged pipe and fittings shall be used in the work and they shall be removed from the site by the contractor at his own cost and charge.

4.5.04 CLEANING: All the pipes and fittings shall be thoroughly cleaned with brush and washed if necessary to remove any accumulated stone, soil or dirt inside and outside surfaces.

4.5.05 TRENCHES: The trench bottom shall be carefully examined for the presence of hard objects such as flints, rock projection or tree roots etc. Pipe shall be embedded in sand or soft soil, free from rock & gravel, back fill 150mm above the pipe shall also be of fine sand or soft soil. Pipe shall not be painted. The width of trench shall not be less than outside diameter of pipe plus 300 mm in case of gravel soils. Pipe shall be laid at least 900 mm below the ground level (measured from the surface of the ground to the top of pipe).

4.5.06 LAYING: The pipes shall be carefully laid straight to the correct alignment in gradients as indicated in the drawing. All the pipe shall be used in standard length as far as possible. Cut length may be used only where it is necessary to make up exact length. The entire length of pipe shall be evenly supported on bed of the trench through out. Care shall be taken to prevent any sand, earth or other materials from entering into the pipes during laying. At the end of day's work the open end shall be suitably plugged.

4.5.07 FIXING: The pipe line shall be fixed in position as shown in the drawing or as directed by the Engineer-in-charge. The pipe shall be fixed with G.I. clamps not less than 2 mm thick or with suitable PVC clamps. The clamps shall be fixed into the wall with G.I. nails not less than 40 mm long and wooden gutties.

Spacing between clamps for fixing internal piping shall be as given below:

<table>
<thead>
<tr>
<th>Pipe dia</th>
<th>For Horizontal Runs</th>
<th>For Vertical Runs</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mm</td>
<td>700 mm</td>
<td>1050 mm</td>
</tr>
<tr>
<td>25 mm</td>
<td>750 mm</td>
<td>1125 mm</td>
</tr>
<tr>
<td>32 mm</td>
<td>825 mm</td>
<td>1240 mm</td>
</tr>
<tr>
<td>40 mm</td>
<td>975 mm</td>
<td>1460 mm</td>
</tr>
<tr>
<td>50 mm</td>
<td>975 mm</td>
<td>1460 mm</td>
</tr>
</tbody>
</table>

4.5.08 MAKING JOINT: The jointing of pipes and fittings generally shall be done with approved make cement solvent inducing making surface rough. The pipe shall be cut to desired length. Care shall be taken that that profile or cut surfaces shall not be changed and the fibrous material shall be removed with scraper or knife.

4.5.09 DETACHABLE JOINT: Detachable joints shall be made where pipes of different materials have to be jointed or as specified in the schedule. The flanges are first pushed over the pipe ends and jointing shall be made by cement solvent.

4.5.10 PAINTING: If mentioned in schedule of work, the exposed pipe line shall be painted with two coats of approved oil paint of matching colour over a coat of primer. Underground pipe line shall not be

4.5.11 DEWATERING: In case of underground pipes, the contract rate shall include bailing or pumping out all the water till completion or work if accumulated during the progress of work either from seepage, springs, rain or any other cause.

4.5.12 TESTING: Please refer clause No.4.4.09

4.6 GUN METAL/BRASS FULL WAY VALVE:

4.6.01 GENERAL: The item includes provision of full way (gate or globe) valve of specified diameter as mentioned in the schedule including fixing. Full way valve is a valve suitable for controlling or stopping the flow in water supply lines.

4.6.02 MATERIAL:

Full way valve shall be of either Brass fitted with a cast iron hand wheel or Gun metal fitted with a C.I. hand wheel as the case may be and shall be of Gate valve type opening full way and of the size as specified conforming to IS 778. The weight of the full way gate valve shall be as per the table given below with a tolerance of 5 percent.

<table>
<thead>
<tr>
<th>Diameter in mm</th>
<th>Flanged arch (Kg)</th>
<th>Screwed arch (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1.021</td>
<td>0.567</td>
</tr>
<tr>
<td>20</td>
<td>1.503</td>
<td>0.680</td>
</tr>
<tr>
<td>25</td>
<td>2.495</td>
<td>1.077</td>
</tr>
<tr>
<td>32</td>
<td>3.232</td>
<td>1.559</td>
</tr>
<tr>
<td>40</td>
<td>4.082</td>
<td>2.268</td>
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<tr>
<td>50</td>
<td>6.691</td>
<td>3.232</td>
</tr>
<tr>
<td>65</td>
<td>10.149</td>
<td>6.804</td>
</tr>
<tr>
<td>80</td>
<td>13.381</td>
<td>8.845</td>
</tr>
</tbody>
</table>

4.6.03 FIXING: The valves shall be fixed in position in the pipeline as shown in the drawing or as directed with necessary socket or union, nuts etc. The screwed, flanged joint shall be made with few turns of fine hemp yarn dipped in linseed oil taken over the threaded ends to obtain complete water tightness.

4.6.04 TESTING: The joints shall be tested to a hydraulic pressure of 1 MPa (10 kg/cm)² along with the testing of pipe line.

4.7 WATER METER:

4.7.01 GENERAL: The item includes provision of Water meter with or without end flanges or non-return valve of specified diameter as mentioned in the schedule with strainer, sockets, flange, union, nuts etc. including fixing and testing.

4.7.02 MATERIAL: Water Meter shall conform to IS 779 and should have ISI certification mark. Non-return valve and strainer shall be of the same diameter as that of water meter. Strainer, sockets, flange, union, union nuts, rubber packing etc. shall be as per the description of item.

4.7.03 FIXING: Water meter shall be fixed in position on the inlet pipe line and the joints shall be made either screwed or flanged with necessary sockets, flanges and union nuts as required or as directed by the Engineer-in-charge.

4.7.04 SCREWED JOINT: A few turns of fine hemp yarn dipped in linseed oil shall be taken over the threaded ends to obtain complete water tight joint.

4.7.05 FLANGED JOINT: The flange joint shall be made for flange type water meter and the joint shall be as per the specification of flanged joint.

4.7.06 TESTING: The joints shall be tested to a hydraulic pressure of 1 MPa (10 kg/cm)² along with testing of pipe line for a minimum duration of two hours.

4.8 PRESSURE REDUCING VALVE:

4.8.01 GENERAL: The item includes provision of pressure reducing valve of specified diameter as mentioned in the schedule including fixing.

4.8.02 MATERIAL: Pressure reducing valve is a device with suitable means of connection for insertion in a vertical pipe line for controlling the water pressure. Valve shall be of brass and shall be vertical flow type, conforming to IS 9739-1981.

4.8.03 FIXING: The valve shall be fixed in position on the pipe line as shown in the drawing or as
4.8.04 **TESTING** : The joints shall be tested to a hydraulic pressure of 1MPa (10 kg/cm²) along with testing of pipeline for a minimum duration of 2 hrs.

4.9 **CAST IRON WATER QUALITY PIPING WORK**:

4.9.01 **GENERAL** : The item includes the provision of supplying water quality cast iron pipe of specified diameter including cutting, laying, fixing, and painting the pipe line.

4.9.02 **MATERIAL** : The pipes shall be centrifugally cast (spun) Iron Pressure pipe conforming to IS 1536 and shall be of class “LA”, “A” or “B”. These shall be of socket and spigot or double flanged. All the pipes shall be cylindrical reasonably true with inner and outer surfaces and nearly concentric as practicable. The outer surface shall be smooth, sound, free from pin holes, cracks and other imperfections. The pipes shall be treated with solution of Dr. Angus Smith’s solution. The coated surface shall give glossy finish. The table showing the dimensions & weight of different diameter of pipes is given below:

**CENTRIFUGALLY CAST (SPUN) IRON ‘WATER QUALITY’ PIPES**

Tolerances : a) Length ± 25 mm  (b) weight 5%  (c) Thickness ± (1+0.05e)mm Value of ‘e’ for

(i) LA class pipe  \( e = 10/12 (7 + 0.02 DN) \)

(ii) A class pipe  \( e = 11/12 (7 + .02 DN) \)

(iii) B class pipe  \( e = (7 + 0.02 DN) \)

---

**CENTRIFUGALLY CAST (SPUN) IRON ‘WATER QUALITY’ PIPES WEIGHT FOR SOCKET & SPIGOT PIPES (IS 1536-2001)**

<table>
<thead>
<tr>
<th>Nom. Dia (DN mm)</th>
<th>Class</th>
<th>Barrel</th>
<th>Pushon Joint</th>
<th>Thickness</th>
<th>Mass for 1 Mt</th>
<th>Total weight for one working length ‘L’ in meter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DE mm</td>
<td>DE mm</td>
<td>3.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E mm</td>
<td>Kg.</td>
<td>Kg.</td>
</tr>
<tr>
<td>80</td>
<td>LA</td>
<td>98</td>
<td>95</td>
<td>7.2</td>
<td>14.7</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>98</td>
<td>95</td>
<td>7.9</td>
<td>16.0</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>98</td>
<td>95</td>
<td>8.6</td>
<td>17.3</td>
<td>5.5</td>
</tr>
<tr>
<td>100</td>
<td>LA</td>
<td>118</td>
<td>115</td>
<td>7.5</td>
<td>18.6</td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>118</td>
<td>115</td>
<td>8.3</td>
<td>20.5</td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>118</td>
<td>115</td>
<td>9.0</td>
<td>22.0</td>
<td>7.1</td>
</tr>
<tr>
<td>125</td>
<td>LA</td>
<td>144</td>
<td>141</td>
<td>7.9</td>
<td>24.2</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>144</td>
<td>141</td>
<td>8.7</td>
<td>26.4</td>
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4.9.03 UNLOADING: The pipe shall be unloaded where they are required. Where mechanical handling facility are not available, pipes weighing up to 60 kg shall be handled by two persons by hand passing and heavier pipes shall be unloaded from the lorry or wagon by holding them in loops, formed with ropes and sliding over plank set not steeper than 45 degrees. Two ropes always shall be used and only one pipe shall be unloaded at a time. Under no circumstances shall pipes be thrown down from the carriers or be dragged or rolled along hard surfaces. The pipes shall be checked for any visible damage while unloading and shall be sorted out for redamation.

4.9.04 STORING: The pipes shall be lined upon on one side of the alignment of the trench, socket facing upgrade when line runs uphill and up stream when line runs on level ground. Each stack shall contain pipes of same class and size. Storage shall be done on firm, level and clean ground. Wedges shall be provided at the bottom layer to keep the stack stable.

4.9.05 CLEANING: The pipes shall be thoroughly cleaned with brush and washed if necessary to remove any accumulated stone, soil or dirt inside and inside of socket and outside of the spigot shall also be cleaned in similar way.

4.9.06 EXAMINATION: Before pipe is laid it shall be first examined for damage and cracks. No cracked or damaged pipe shall be used. The pipe shall be tested with a hammer to prove its soundness

4.9.07 DAMAGED MATERIAL: If any material found damaged or cracked, the same shall not be used in the work. The contractor has to replace the same at his own cost and charges.

4.9.08 TRENCHES: The depth of the trenches shall not be less than 1000 mm measured from the top of the pipe to the surface of the ground under roads and not less than 750 mm elsewhere. The width of the trench shall be the nominal diameter of the pipeline plus 400 mm, but it shall not less than 550 mm in case of all kind of soil, excluding rock and not less than 1000 mm in case of rock.

Trench shall be so deep that the pipes may be laid to the required alignment and at required depth. The width of trench at bottom between face of sheeting shall be such as to provide not less than 200 mm clearance on either side of the pipe. Trenches shall be of such extra width, when required as will permit the convenient placing of timber supports strutting and planking handling of specials etc. The bed of trench, in soft or made up earth, shall be well watered and rammed before laying the pipes and depression,
if any, shall be properly filled with earth and consolidated in 20 cm layers.

If the trench bottom is extremely hard or rocky or loose stoney soil, the trench shall be excavated 150mm below the trench grade. Rocks, stones or other hard substances from the bottom of the trench shall be removed & trench brought back to the required grade by filling with selected fine earth or sand or fine murrum & compact so as to provide a smooth bedding for pipe.

After the excavation of the trench is completed, hollows shall be cut at the required position to receive the socket of the pipe. The barrels of the pipes shall rest through their entire length on the solid ground that sufficient space left for joining the under side of the pipe joints. These socket holes shall be refilled with sand after jointing the pipe.

The trench shall be kept free from water shoring and timbering shall be provided wherever required. Excavation below water table shall be done after dewatering the trenches. The road crossing shall be excavated half at a time and where the pipe line/drain crosses on existing road after the pipe have been laid in the first half and the trench refilled. Care shall be taken not to disturb the electrical & communication cable net with during the course of excavation.

4.9.09 LOWERING : The pipe shall then be placed in trenches by means of proper sheer legs, chains and other tacts and shall be properly driven home. In no case pipe shall be rolled or dropped into the trench. One end of rope may be tied to a wooden or steel Pag or driven into ground and other end hold by men which when slowly released till lower the pipe into trench.

4.9.10 LAYING : The pipes shall be carefully laid straight to correct alignment in raising or falling gradients. The socket end of the pipe shall face uphill. All the pipe shall be used in standard length as far as possible. Cut length may be used only where it is necessary to make up exact length. While jointing the spigot it should be neatly placed into the socket for full length and properly supported. The pipe shall be carefully packed underneath so that they shall bear loads arising from traffic evenly through out their whole length. The entire length of pipe shall be supported on bed of the trench evenly through out. Care shall be taken to prevent any sand, earth or other materials from entering into the pipes during laying. At the end of the day’s work the open end shall be suitably plugged.

No pipe shall be laid until the trench has been excavated to its required depth for a distance of about 5 M in front of the pipe to be laid. No pipe shall be covered until it has been passed by the Engineer-in-charge.

In unstable soils, such as soft soil and dry lumpy soil it shall be checked whether the soil can support the pipe and if required, suitable special foundation shall be provided.

Where the soils are drastically affected by extremes of saturation and dryness, those soils are subjected to extraordinary shrinkage which from wide and deep cracks in the earth surface may result in damage to underground pipe because of tight gripping bond between pipe and day, subjecting to it excessive stresses as the day shrinks. In such case an envelope of minimum 100 mm of tamped sand shall be made around the pipe line to avoid any bonding.

In places where rock is encountered, cushion of fine earth or sand shall be provided for a depth of 150mm by excavating extra depth of the trench where the gradient of the bad slopes is more than 30 depths, it may necessary do and or fine pipe against sliding downwards.

4.9.11 FIXING : The contractor shall first get the layout for pipe line approved by the Engineer-in-charge as may be required by the bye-laws. The pipe line shall be so fixed / laid as not to expose to the heat or subject to any injury or risk to the pipe. The socket end of the pipe shall be facing up. All the pipes shall be used in standard length as far as possible. Cut length may be used only where it is necessary to make up exact length

4.9.12 THRUST BLOCK : Thrust blocks are required to transfer the resulting hydraulic thrust from the fittings of pipe on to a larger load bearing soil section. Thrust blocks shall be installed wherever there is a change in the direction/size of the pipe line or the pressure line diagram, or the pipe line ends at a dead end. If necessary, thrust blocks may be constructed at valves also. Thrust block shall be constructed taking into account the pipe size, water pressure, type of filling, gravity component when laid on slopes and the type of soil. In case of pipe line laid in soft soil, joints/couplings are to be anchored on each side by providing side thrust blocks without restricting the coupling.

Pipes on slopes need be anchored only when there is a possibility of the backfill around the pipe sloping down the hill and carrying the pipe with it. Generally for slopes upto 30 degrees, good, well drained soil carefully damped in layers of 100mm under and over the pipe, right up to the top of trench will not require anchoring.

For steeper slopes, one out of every three pipes shall be held by straps fastened to vertical supports anchored in concrete.

4.9.13 BACK FILLING: Back filling shall follow the pipe installation as closely as possible to protect pipe from falling boulders, eliminating possibility of lifting of the pipe due to flooding of open trench and shifting pipe out of line by caved in soil.

The soil under the pipe and coupling shall be solidly tamped. The initial backfill material shall be free of
large stones and dry lumps.

In bags and Monschers gravel or crushed stone may be used for this purpose. The initial backfill shall be placed evenly in a layer of 100 mm thick and consolidated up to a cushion of at least 300 mm cover over the pipe. Joints shall be taken care to resist the movement of the pipe due to pressure while testing.

4.9.14 TESTING: After a new pipe has been laid, jointed and backfilled (or any valved section thereof), it shall be subjected to the following two tests:

a) Pressure test at a pressure of at least double the maximum working pressure-pipe and joints shall be absolutely water tight under the test.

b) Leakage test (to be conducted after the satisfactory completion of the pressure test) at a pressure to be specified by the authority for a duration of two hours.

Hydrostatic Tests:

Portions of the line shall be tested by subjecting to pressure test as the laying progresses before the entire line is completed. In this way any error of workmanship will be found immediately and can be corrected at a minimum cost. Usually the length of the section to be tested shall not exceed 500 m.

Where any section of a main is provided with concrete thrust blocks or anchorages, test shall not be made until at least two days have elapsed.

Prior to testing, enough backfill as described in 4.9.12 shall be placed over the pipe line to resist upward thrust. All thrust blocks forming part of the finished line shall have been sufficiently cured and no temporary bracing shall be used.

The open end of the section shall be sealed temporarily with an end cap having an outlet which can serve as an air relief vent or for filling the line, as may be required. The blind face of the end cap shall be properly braced during testing by screw jacks and wooden planks or steel plate. The section of the line to be tested shall be filled with water manually or by a low pressure pump. Air shall be vented from all high spots in the pipe line before making the pressure strength test because entrapped air gets compressed and causes difficulty in raising the required pressure for the pressure strength test.

The test pressure shall be gradually raised at the rate of approximately one kg/sqcm/mm. The duration of the test period if not specified shall be sufficient to make a careful check on the pipe line section.

Procedure for pressure test:

Each valved section of the pipe shall be slowly filled with water and all air shall be expelled from the pipe through hydrants and blow offs. If these are not available at high places, necessary tapping may be made at points of highest elevation before the test is made and plugs inserted after the tests have been completed.

If the trench has been partially back-filled the specified pressure based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer-in-Charge. The duration of the test shall not be less than 5 minutes.

Examination under Pressure: All exposed pipes, fittings, valves, hydrants and joints should be carefully examined during the open-trench test. When the joints are made with lead, all such joints showing visible leaks shall be recaulked until tight. When the joints are made with cement and show seepage or slight leakage, such joints shall be cut out and replaced as directed by the authority. Any cracked or defective pipes, fittings, valves or hydrants discovered in consequence of this pressure test shall be removed and replaced by sound material and the test shall be repeated until satisfactory to the Engineer-in-Charge.

If the trench has been back-filled to the top, the section shall be first subjected to water pressure normal to the area and the exposed parts shall be carefully examined. If any defects are found, they shall be repaired and the pressure test repeated until no defects are found. The duration of the final pressure tests shall be at least one hour.

Procedure for Leakage Test:

Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

No pipe installation shall be accepted until the leakage is less than the number of cm3/h determined by the formula:

\[ q_l = \frac{ND\sqrt{P}}{3.3} \]

Where \( q_l \) = the allowable leakage in cm3/h
\( N \) = number of joints in the length of the pipe line.
D = diameter in mm, and
P = the average test pressure during the leakage testing kg/cm$^2$.

**Variation from Permissible Leakage**: Should any test of pipe laid in position discloses leakage greater than that specified in above para., the defective joints shall be repaired until the leakage is within the specified allowance.

4.9.15 **DEWATERING**: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

4.10 **SPECIALS FOR C.I. WATER SUPPLY PIPE LINE**:

4.10.01 **GENERAL**: The item includes supplying cast iron water quality or M.S. specials of specified diameter for C.I. water supply pipe including laying, fixing and painting the specials.

4.10.02 **MATERIALS**: The specials for cast iron water quality pipe shall be conforming to IS 1538 & 13382 with socket and spigot or monolithic double flanged. All the fittings shall be cylindrical, reasonably true with inner and outer surfaces and nearly concentric as practicable. The outer surface shall be smooth, sound, free from pin holes, cracks and other imperfections. M.S. specials shall be made out of M.S. plate of thickness of 6 mm for pipes upto 100mm and 8 mm thick for pipes above 100 mm to 300. 10 mm thick for pipe above 300 mm.

4.10.02 A: M.S. specials shall be treated with Anticorrosive coating of Bituminous based coro coat.

4.10.03 **CLEANING**: The specials and fittings shall be thoroughly cleaned with brush and washed if necessary to remove any accumulated stone, soil or dirt inside the socket and outside of the spigot.

4.10.04 **EXAMINING**: Before special is laid, it shall be first examined for damage and cracks. No cracked or damaged pipe shall be used. The pipe shall be tested with a hammer to prove its soundness.

4.10.05 **DAMAGED MATERIAL**: If any material found damaged or cracked, the same shall not be used in the work. The contractor has to replace the same at his own cost and charges.

4.10.06 **LOWERING**: The specials shall then be placed in trenches by means of proper sheer legs, chains and other tacts and shall be properly driven home.

4.10.07 **FIXING**: The specials shall be fixed by means of lead or flanged joint on C.I. Pipe line wherever required and as shown in the drawing or as directed by the Engineer-in-charge.

4.10.08 **TESTING**: Joints shall be tested to a hydraulic pressure of 10 kg/cm$^2$ alongwith testing of pipe line and shall be maintained for minimum two hours. All leakages, defects etc. shall be rectified.

4.10.09 **DEWATERING**: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause till the completion of work.

4.11 **LEAD JOINT**:

4.11.01 **GENERAL**: The item includes making lead joints for C.I. water quality pipes and fittings/specials including testing etc.

4.11.02 **MATERIAL**: Lead shall be conforming to IS 782 and of good quality manufactured by Hindustan zinc or equivalent. Fine hemp yam shall be the best available in the market.

4.11.03 **PREPARATION**: Outside of the spigot and inside of the socket shall be thoroughly cleaned with brush. The spigot shall be carefully centred in the socket by one or more laps of spun hemp yam twisted into ropes of uniform thickness thoroughly soaked in hot coal-tar or bitumen and cooled before use.

4.11.04 **POURING**: Pouring of lead shall be done by means of ropes covered with clay or by using special leading rings. The lead shall be melted rendering it thoroughly fluid and each joint shall be filled in one pouring.

4.11.05 **CAULKING**: The caulking shall be carried out with molten lead. Hemp yam shall be driven into the bottom of the socket and leave the space required. The molten lead shall then be run in sufficient quantity so that after being caulked solid, the lead may project 3 mm beyond the face of the socket against the outside of the spigot, but must be flushed with the outside edge of the socket.

The lead taken from the pot shall be run hot into the joint and the joint filled in one running. The joint shall be caulked well, by a suitable caulking tool and 2 kg hammer and the joint left neat and smooth. In case C.I. fittings are also conforming to the same specification that of pipes, the consumption of lead will be worked out on the basis of actual consumption for each joints.

The following table shows consumption of the weight of lead & yarn per joint as per IS 3114 : 1994
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<th>Nominal Internal Dia in mm</th>
<th>Spun Yarn Mass in Kg.</th>
<th>Lead Mass in kg.</th>
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**NOTE:**

i) The quantities of lead given are on average basis and a variation of 10 percent is permissible.

ii) Before pipe are jointed on large scale, three or four sample joints shall be made and the average consumption of lead per joint shall be got approved by the Engineer-in-charge.

**4.11.06 TESTING:** The pipe line after being laid and jointed shall be tested under the supervision of the Engineer-in-Charge. The testing shall be carried out by the contractor at his own cost and charges. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost.

The length of pipes to be tested shall be first filled with water from a higher section of pipe and the test pressure is applied. The test pressure shall be 10 kg per square centimeters and shall be maintained for two hours continuously.

**4.11.07 DEWATERING:** The contract rate shall include bailing out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause till the completion of work.

**4.12 G M GATE VALVE CHAMBER:**

**4.12.01 GENERAL:** The item includes construction of brick masonry valve chamber of size as specified in this schedule including providing M.S./G.I. frame and cover over R.C.C pre-cast cover with or without surface box.

**4.12.02 MATERIAL:** Brick work, plastering, concreting etc. shall be as per general specification. Pre-cast RCC cover slab, surface box, C.I/M.S frame and cover etc. shall be size and weight as specified in the schedule.

**4.12.03 CONSTRUCTION:**

a) Foundation concrete of mix 1:4:8 shall be of 150 mm thick with 150 mm offset around or as specified in the schedule.

b) Brick masonry in cement mortar 1:4 as specified.

c) Plastering inside and outside surfaces of walls in two courses using cement mortar 1:3 of thickness as specified mixed with water proofing compound of specified Quality including inner surfaces finished smooth with neat cement punning.

**4.12.04 RCC PRECAST/CAST IRON COVERS**

**4.12.04.1 RCC PRECAST COVER (for chambers of size upto 600 x 600 mm):** Chamber cover shall be casted as shown in the drawing having minimum 75 mm thick in cement concrete 1:2:4 or as specified in the schedule by using nominal reinforcement 100 kg/Cum of concrete including shuttering, finishing, curing, plading in position etc.

**4.12.04.2 CAST IRON/ M.S COVER:** Cast iron/M.S cover of specified size and weight shall be supplied
and placed over the chamber as directed. The cover shall be painted with 3 coats of black bitumastic paint.

4.12.05 DEWATERING: The water accumulated in the pit due to rain, seepage, springs or any other cause during the progress of work shall be pumped/bailed out till the completion of work.

4.13 C.I. SLUICE VALVE CHAMBER:

4.13.01 GENERAL: The item includes construction of brick masonry valve chamber of size as specified in this schedule including providing M.S./G.I. frame and cover over R.C.C pre-cast cover with or without surface box.

4.13.02 MATERIAL: Brick work, plastering, concreting etc. shall be as per general specification. Precast RCC cover slab, surface box, C.I/M.S frame and cover etc. shall be size and weight as specified in the schedule.

4.13.03 CONSTRUCTION:

a) Foundation concrete of mix 1:4:8 shall be of 150 mm thick with 150 mm offset around or as specified in the schedule.

b) Brick masonry in cement mortar 1:4 as specified.

c) Plastering inside and outside surfaces of walls in two courses using cement mortar 1:3 of thickness as specified mixed with water proofing compound of specified Quality including inner surfaces finished smooth with neat cement punning.

4.13.04 RCC PRECAST/CAST IRON COVERS

4.13.04.01 RCC PRECAST COVER (for chambers of size above 1000 x 1000 mm) Chamber cover shall be coated in minimum three equal parts or more as directed with lifting hooks as shown in the drawing. RCC slab shall be cast along with galvanized M.S. angle iron frame with stiffness and anchors made out of the sizes as specified in the schedule. The exposed portion of the angle frame shall be painted with the coats of silver paint over a coat of primer.

RCC pre-cast slab shall be of 100 mm thick (unless otherwise specified) in cement concrete 1:2:4 of size as specified in the drawing schedule by using nominal reinforcement 100 kg/Cum of concrete including shuttering, curing etc. and shall be placed in position as directed. Cast iron road surface of prescribed weight shall be fixed to the cover slab during casting the slab for key rod operation.

Road surface box shall be of size 100x125x150 mm conforming to IS 3950 having hinged and weighing not less than 14 kg. The surface box shall be fixed on top of the RCC cover slab during the casting of slab for key rod operation. The surface box shall be painted with 3 coats of black bitumastic paint.

4.13.04.2 CAST IRON/ M.S COVER: Cast iron/M.S cover of specified size and weight shall be supplied and placed over the chamber as directed. The cover shall be painted with 3 coats of black bitumastic paint.

4.13.05 DEWATERING: The water accumulated in the pit due to rain, seepage, springs or any other cause during the progress of work shall be pumped/bailed out till the completion of work.

4.14 FLANGES & FLANGED JOINT: (Screwed or welded Flanges)

4.14.01 GENERAL: The item includes supplying flanges and providing flanged joint for G.I./M.S./C.I pipes, fittings and specials including testing.

4.14.02 MATERIAL: The CI flanges shall be conforming to IS 3516 or IS 1536. The heavy quality G.I./M.S. flanges shall be conforming to I.S.6392 having thickness not less than 20 mm for pipes having diameter beyond 80 mm and 12 mm for pipes having diameter below 80 mm including drilling holes in new flanges, jointing with the pipe by means of welding or screwed joint. Rubber insertion shall be of three ply not less than 3 mm thick of approved make or fiber board impregnated with chemically neutral mineral oil having smooth & hard surface weighing not less than 112 gm/mm thickness. Bolts, nuts and washers used shall be of good quality.

4.14.03 MAKING JOINT: Flanged joints shall be made by joining the facing of the flange with the packing of rubber insertion and boiling up evenly on all sides. A thin layer of lead wool shall be provided for making the joints water tight where facing of the pipe is not true. The packing shall be of rubber insertion of three ply and of approved make and thickness. The packing should be of full diameter of the flange with proper pipe hole and bolt hole; cut even at both the inner and outer edges.

4.14.04 DEWATERING: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause till the completion of work.

4.14.05 TESTING: The joints shall be tested along with pipe line after the pipe line is laid and jointed.
4.15 FLEXIBLE PUSH-ON JOINT (TYTON/ RING JOINT)

4.15.1 GENERAL: The item includes push-on joint with rubber ring for C.I. pipes, fittings and including testing.

4.15.2 MATERIAL: Rubber ring shall be moulded or tubular natural or synthetic rubber gasket conforming IS 12820.

4.15.3 JOINTING: The groove and the socket shall be thoroughly cleaned before inserting the rubber gasket while inserting the gasket it shall be made sure that it faces the proper direction and that it is correctly seated in the groove. After deaning dirt or foreign materials from the plain end, non petroleum lubricant shall be applied in accordance with the pipe manufacturer’s recommendations. The plain end of the pipe is pushed into the socket of the pipe and while pushing, the pipe shall be kept straight. If any deflections are to be made in the alignment, it may be made after the joint is assembled. The permissible ° deflection shall not be exceeded as per IS 3114 for socket and spigot rubber joint is 5 for 80 to 300 mm nom. bore, 4 ° for 350 to 400 mm nom bore and 3 ° for 450 to 750 mm nom bore pipe. A timber header shall be used between the pipe and crowbar or jack to avoid damage to the pipe while the plain end of the pipe is pushed into the socket either with a crowbar or jack or lever pull.

4.15.4 TESTING: The joints shall be tested along with pipe line after the pipe line is laid and jointed. The testing shall be as per the clause of testing of the pipe line.

4.15.5 Dewatering: The contract rate shall include bailing out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause till the completion of work.

4.16 C.I. SLUICE VALVE:

4.16.01 GENERAL: The item includes supplying of C.I. Sluice Valve of specified diameter as mentioned in the schedule including fixing.

4.16.02 MATERIAL: The Sluice valve shall be of Class or pressure rating as specified in the schedule of quantities and conforming to I.S. 14846. The valve shall be of cast iron and / or spheroidal iron having non-rising spindle with hand wheel & spindle of stainless steel.

4.16.03 FIXING: The C.I. sluice valve shall be fixed in position as indicated in the drawing or as directed. They shall be fitted with the tail pieces on both sides by means of flange joints.

4.16.04 Dewatering: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause till completion of the work.

4.16.05 TESTING: The Sluice Valve and the joints shall be tested as per the clause of testing of the pipe line. The testing shall be done along with the pipe line testing.

4.17 C.I. NON RETURN VALVE:

4.17.01 GENERAL: The item includes supplying of C.I. Non-Return Valve of specified size in the schedule of quantities including fixing.

4.17.02 MATERIAL: Non-return valve shall be conforming to IS 9338 or IS 5312 as specified in schedule of quantities. The body, domes, covers, stuffing box, thrust plates, hand wheel, wedges, gland and cap shall be of cast iron not less than of grade FG200 and all in side working parts should be of any non ferrous or ferrous materials such as gun metal. Valve of single door pattern swing type shall have test pressure of PN1.6(50 to 125 mm size), PN1.0 (150 to 300mm size), PN0.6 (350 to 600 mm size) as per IS 5312 (part 1). Valve of multi door pattern swing type shall have test pressure of PN0.6(400 to 1200 mm size), PN1.0 (400 to 1200mm size) as per IS 5312 (part 2). Valve shall be tested for the body and seat and the defective valve shall be replaced by the contractor at his own cost.

4.17.03 FIXING: The C.I. Non-Return valve shall be fixed in position as indicated in the drawing or as directed. They shall be fitted with the tail pieces on both sides by means of flange joints.

4.17.04 Dewatering: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

4.17.05 TESTING: The C.I. Non-Return valve shall be fixed in position shall be tested hydraulically to a minimum pressure as per testing clause of piping work. The testing shall be done along with the testing of pipe line.

4.18 FOOT-VALVE:
4.18.01 GENERAL: The item includes supplying of C.I. body. Foot-Valve of specified diameter as mentioned in the schedule including fixing.

4.18.02 MATERIAL: Foot-Valve shall be conforming to IS 4038 and with C.I. body not less than of grade FG200 and strainer with internal gun metal working parts. The valve shall be screwed end (25 to 150 mm size), flanged end (50 to 450 mm size), single disc type (up to 150 mm size), two disc type (exceeding 150 mm size), lift type (up to 100 mm size). The valve shall be tested for housing 0.6 MPa (6 kg/cm²) and for seat 0.2 MPa (2 kg/cm²) for 2 minutes as per IS 4038. The ball type foot valve with nitrile rubber ball and with bronze seat may be used as specified in the schedule of quantities. The defective Foot-Valve shall be replaced by the contractor at his own cost.

4.18.03 FIXING: Foot-Valve shall be fixed in position as shown in the drawing or as directed. They shall be fitted by means of flange joints.

4.18.04 TESTING: The C.I. Foot-Valve and the joints shall be tested hydraulically to a minimum pressure as per testing clause of piping work. The testing shall be done along with the testing of pipeline.

4.19 AIR VALVE:

4.19.01 GENERAL: The item includes supplying of single, double action or kinetic air Valve of specified diameter as mentioned in the schedule including fixing.

4.19.02 MATERIAL: The Air Valve shall be of heavy quality conforming to IS 14845 with IS certification mark and isolation valve. The body, domes, covers, stuffing box, thrust plates, wedges, gland and cap shall be of cast iron not less than of grade 20 and inside working parts should be of any non-ferrous or ferrous materials.

4.19.03 FIXING: The Air Valve shall be fixed in position as indicated in the drawing and as directed by the Engineer-In-Charge.

4.19.04 TESTING: The Air Valve and the joints shall be tested hydraulically to a minimum pressure as per testing clause of piping work. The testing shall be done along with the testing of pipe line.

4.20 BUTTERFLY VALVE:

4.20.01 GENERAL: The item includes supplying and fixing of butterfly valve of specified diameter as mentioned in the schedule.

4.20.02 MATERIAL: The butterfly valve shall be flanged type or as specified conforming to IS 13095 & BS - 5155. The valve shall be bubble tight, resilient sealed suitable for flow in either direction with accompanying flanges and steel handle.

4.20.03 FIXING: The butterfly valve shall be fixed to the pipe line in position as indicated in the drawing and as directed by the Engineer-In-Charge.

4.20.04 TESTING: The valve and the joints shall be tested to a minimum hydraulically pressure of 10 kg/sqcm for a duration of two hours or as per testing clause of piping work. The testing shall be done along with the testing of pipe line. The leaky joints shall be rectified to the satisfaction of the Engineer-In-Charge.

5.0 DRAINAGE SYSTEM

5.1 CAST IRON SOIL QUALITY PIPING WORK:

5.1.01 GENERAL: The item includes supplying of soil quality CAST IRON pipe of specified diameter with fittings and fixtures including laying, fixing, cutting, jointing and painting the pipe line.

5.1.02 MATERIAL: Cast Iron soil quality pipes and fittings shall have ISI certification mark. Sand-Cast, Cast Iron Soil quality or rain water pipes and fittings shall confirm to IS 1729 and centrifugally cast (Spun Cast) cast iron soil quality pipe shall confirm to IS 3989. All the pipes and fittings shall be cylindrical reasonably true with inner and outer surfaces and nearly concentric as practicable. The outer surface of the pipe and fitting shall be finished well, sound, free from pin hole, cracks and other imperfections. The pipes & fittings shall be treated with solution of Dr. Angus Smith’s solution.

The dimensions, weight of Sand-Cast Iron/Ductile Iron pipes and fittings shall be as per following table of IS 1729 – 2002 or its latest revision.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Nominal Dia.</th>
<th>Thickness of wall</th>
<th>Nominal weight for pipes of overall length (L) (Exclusive of ears)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.0 m</td>
</tr>
</tbody>
</table>

Tolerance: Mass (-) 5%, thickness (-) -2mm, pipe length (+/-) 20 mm, fitting length (+/-) 10 mm.
The Dimensions, weight of Spun cast pipes and fittings shall be as per following table of IS 3989 - 1984 or its latest revision.

**Tolerances:**
(a) Thickness (-)15%  
(b) Weight (-) 10%  
(c) Length (+ / -) 20 mm  
shall as per IS 3989

<table>
<thead>
<tr>
<th>SN</th>
<th>Nominal Dia.</th>
<th>Thickness</th>
<th>Approximate weight for pipes of overall length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.0m</td>
</tr>
<tr>
<td>1.</td>
<td>50 mm</td>
<td>3.5 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13.4</td>
</tr>
<tr>
<td>2.</td>
<td>75 mm</td>
<td>3.5 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20.0</td>
</tr>
<tr>
<td>3.</td>
<td>100 mm</td>
<td>4 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30.0</td>
</tr>
<tr>
<td>4.</td>
<td>150 mm</td>
<td>5 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>56.0</td>
</tr>
</tbody>
</table>

5.1.03 **EXAMINING**: Before laying the pipe line, it shall be first examined for damages and cracks. No cracked or damaged pipe and fittings shall be used in the work and they shall remove from the site by the contractor at his own cost & charge.

5.1.04 **CLEANING**: All pipes and fittings shall thoroughly cleaned with brush and washed if necessary to remove any accumulated stone, soil or dirt inside and out side of piping material.

5.1.05 **FIXING**: The pipe shall be fixed as shown in the drawing. If the holes are not left in parapet, wall, beam, slab, floor, etc., they shall be cut and cavity surrounding the pipe made good property after fixing the pipe. The pipe shall be fixed with nails and M.S. clamps having thickness not less than 3 mm, 20 mm wide or as specified in the schedule with socket facing up.

Spacing between clamps for fixing internal piping shall be as per IS 2065 – 1983 as given below:

<table>
<thead>
<tr>
<th>Nom. dia of pipe</th>
<th>Horizontal Runs</th>
<th>Vertical Runs</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mm</td>
<td>2 M</td>
<td>2 M</td>
</tr>
<tr>
<td>80 &amp; 100 mm</td>
<td>2.5 M</td>
<td>2.5 M</td>
</tr>
</tbody>
</table>

The pipe and fitting shall be kept 50 mm away from the wall face to facilitate cleaning and painting etc. For rain water pipe the inlet end shall be carefully fixed to admit water from roof and shoe shall be fixed at outlet. Cowl shall be fixed at top end of the vent pipe.

5.1.06 **LAYING**: The pipes shall be carefully laid straight to correct alignment in gradients as indicated in the drawing or as directed by the Engineer-in-charge. The socket end of the pipe shall be uphill. All the pipes shall be used in standard length as far as possible. Cut length may be used only where it is necessary to make up exact length. While joining, the spigot shall be neatly placed into the socket for full length and properly supported. The entire length of pipe shall be evenly supported on the trench bed through out. Care shall be taken to prevent any sand, earth or other materials from entering into the pipes during laying. At the end of day's work the open end shall suitably plugged.

No pipe shall be laid until the trench has been excavated to its required depth for a distance of about 5 M in front of the pipe to be laid. No pipe shall be covered until it has been passed by the Engineer-in-charge.

5.1.07 **MAKING LEAD JOINT**: The spigot shall be carefully centered in the socket by one or more laps of spun hemp yarn twisted into ropes of uniform thickness thoroughly soaked in hot coal-tar or bitumen and cooled before use. The joints shall be made with molten lead and hemp yarn. The lead shall be melted rendering it thoroughly fluid and each joint shall be filled in one pouring. The lead may project 3 mm beyond the face of the socket against the outside of spigot, but must be flushed with the outside edge of the socket.

After the lead has been run into the joint, the lead shall be thoroughly caulked by a suitable caulking tool and 2 Kg hammer and the joint left neat and smooth. The consumption of lead will be worked out on the basis of actual observation at site. The following table shows consumption of lead and yarn per joint.
### DIAMETER OF PIPE (MM) | YARN (in kg.) | LEAD (in kg.)
---|---|---
50 | 0.06 | 0.77
80 | 0.09 | 0.88
100 | 0.11 | 0.98
150 | 0.18 | 1.20

5.1.08 TESTING : The pipe line which is laid on the ground or below the ground level, the joints shall be tested with two meter head of water from a higher section of pipeline.

The pipe line fixed vertically on the wall shall be tested by the smoke test. The Greasy cotton waste shall be burnt in a smoke machine consisting of bellows and a burner. If any lead joint is found to be sweating or leaking, the contractor shall rectify the same till water tightness is attained to the full satisfaction of the Engineer-in-charge.

5.1.09 DEWATERING : In case of underground piping, the contract rate shall include bailing or pumping out all the water till completion of work if accumulated during the progress of work either from seepage, springs, rain or any other cause.

5.2 UPVC- SWR PIPING WORK :

5.2.01 GENERAL : The item includes supplying of UPVC soil, waste and rain water (SWR) and ventilation pipes with fittings of specified diameter including laying, fixing, cutting, joining, painting if required etc.

5.2.02 MATERIAL : The pipes shall conforming to IS 13592, UPVC - SWR and fittings conforming to IS 13591 shall be free from cracks, flaws and defects and shall be able to withstand a pressure as mentioned in the schedule of work. Rubber sealing rings conforming to IS 5382 with lubricant for sliding socket joints as mentioned in the schedule of work.

5.2.03 EXAMINING : Before laying the pipe line, it shall be first examined for damages and cracks. No cracked or damaged pipe and fittings shall be used in the work and they shall be removed from the site by the contractor at his own cost and charge.

5.2.04 CLEANING : All the pipes and fittings shall be thoroughly cleaned with brush and washed if necessary to remove any accumulated stone, soil or dirt inside and out side surfaces.

5.2.05 LAYING : The pipes shall be carefully laid straight to the correct alignment in gradients as indicated in the drawing. All the pipe shall be used in standard length as far as possible. Cut length may be used only where it is necessary to make up exact length. The entire length of pipe shall be evenly supported on bed of the trench through out. Care shall be taken to prevent any sand, earth or other materials from entering into the pipes during laying. At the end of day's work the open end shall be suitably plugged.

5.2.06 FIXING : The pipe line shall be fixed in position as shown in the drawing or as directed by the Engineer-in-charge. The pipe shall be fixed with G.I. clamps not less than 2.0 mm thick of with suitable UPVC clamps/dips. The clamps/dips shall be fixed into the wall with G.I. nails not less than 40 mm long and wooden gutties keeping the pipe about 15 mm clear of the wall.

5.2.07 MAKING JOINT : The jointing of pipes and fittings generally shall be done with approved make cement solvent including making surface rough or rubber sealing rings with lubricant for sliding socket joints. The pipe shall be cut to desired length. Care shall be taken that that profile or cut surfaces shall not be changed and the fibrous material shall be removed with scraper or knife.

5.2.08 DETACHABLE JOINT : Detachable joints shall be made where pipes of different materials have to be jointed or as specified in the schedule. The flanges are first pushed over the pipe ends and jointing shall be made by cement solvent.

5.2.09 PAINTING : In case of underground piping, the pipe line shall be painted with two coats of approved oil paint of matching colour over a coat of primer.

5.2.10 DEWATERING : In case of underground pipes, the contract rate shall include bailing or pumping out all the water till completion of work if accumulated during the progress of work either from seepage, springs, rain or any other cause.

5.2.11 TESTING : Please see clause no.5.3.10

5.3 HIGH DENSITY POLYETHYLENE PIPING WORK FOR DRAINAGE:

5.3.01 GENERAL : The item includes supplying of HDPE pipes with fittings of specified diameter
including laying, fixing, cutting, jointing.

5.3.02 MATERIAL: The pipes and fittings shall conform to IS 14333. HDPE pipes and fittings shall be free from cracks, flaws and defects and shall be able to withstand a pressure as mentioned in the schedule.

5.3.03 EXAMINING: Before laying the pipe line, if shall be first examined for damages and cracks, No cracked or damaged pipe and fittings shall be used in the work and they shall be removed from the site by the contractor at his own cost and charge.

5.3.04 LAYING: Please refer clause 4.4.03
5.3.05 FIXING: Please refer clause 4.4.05
5.3.06 MAKING JOINT: Please refer clause 4.4.06
5.3.07 DETACHABLE JOINT: Please refer clause 4.4.07
5.3.08 ANTISYPHONAGE: The HDPE pipes shall be used for anti-syphonage including provision, cutting, wastage, bending, dressing, jointing with cement solution, necessary plugs, brass fittings such a brass thimbles, brass union, brass cleaning caps and other brass fittings as required.

5.3.09 DEWATERING: In case of under ground piping works, the contract rate shall include bailing or pumping out all the water till completion of work if accumulated during the progress of work either from seepage, springs, rain or any other cause.

5.3.10 TESTING: The joints shall be tested by either smoke test for vertical stacks or 2.5 m head of water at the highest point of the section under test for horizontal drainage pipes. Smoke shall be pumped into the pipes at the lowest end from a smoke machine which consists of a below burner. The material usually burnt is greasy cotton waste which gives out a dear pungent smoke which is easily detectable by sight as well as by smell, if there is leak at any point of the drain. The water head test shall be carried out by suitably plugging the lower end of the drain and the ends of the connection if any and filling the system with water. A knuckle bend shall be temporarily jointed to it so as to provide required test head, or the top may be plugged with a connection to a hose ending in a funnel which could be raised or lowered till the required head is obtained and fixed suitable for observation. The leaky joints shall be remade and section re-tested at no extra cost.

5.4 PVC PIPING WORK:

5.4.01 GENERAL: The item includes supplying of PVC pipes with fittings of specified diameter including laying, fixing, cutting, jointing, painting etc. for vent, overflow, waste water pipe line etc.

5.4.02 MATERIAL: The pipes and fittings shall conform to series IV of IS 4985, PVC pipes and fittings shall be free from cracks, flaws and defects and shall be able to withstand a pressure as specified in the schedule.

5.4.03 EXAMINING: Before laying the pipe line, it shall be first examined for damages and cracks, No cracked or damaged pipe and fittings shall be used in the work and they shall be removed from the site by the contractor at his own cost and charge.

5.4.04 CLEANING: All the pipes and fittings shall be thoroughly cleaned with brush and washed if necessary to remove any accumulated stone, soil or dirt inside and outside surfaces.

5.4.05 LAYING Please refer clause 4.5.05
5.4.06 FIXING: Please refer clause 4.5.06
5.4.07 MAKING JOINT: Please refer clause 4.5.07
5.4.08 DETACHABLE JOINT: Detachable joints shall be made where pipes of different materials have to be jointed or as specified in the schedule. The flanges are first pushed over the pipe ends and jointing shall be made by cement solvent.

5.4.09 PAINTING: If mentioned in schedule of work, the pipe line shall be painted with two coats of approved oil paint of matching colour over a coat of primer.

5.4.10 DEWATERING: In case of underground pipes, the contract rate shall include bailing or pumping out all the water till completion of work if accumulated during the progress of work either from seepage, springs, rain or any other cause.

5.4.11 TESTING: The joints shall be tested hydraulically to a pressure as specified in the schedule. The leaky joints shall be remade and section re-tested at no extra cost. The period of test shall be for maximum 2 (two) hours.

5.5 GULLY TRAP:

5.5.01 GENERAL: The item includes provision of S.W. Gully trap with C.I. frame including construction
5.5.02 MATERIAL: The Gully Trap shall be of salt glazed stoneware with 150 mm nominal square inlet or as specified in the schedule with 100 mm diameter outlet. Brick work, plastering, concreting shall be as per general specifications under section-II.

5.5.03 CONSTRUCTION:
1. Internal dimension of the Gully trap chamber shall be as specified in the schedule.
2. Foundation of 1:4:8 concrete shall be 150 mm thick, and shall have 100 mm offset.
3. Brick masonry shall be of 230 mm thick in cement mortar 1:6 and masonry shall be plastered with 15 mm thick plaster in 1:3 cement mortars inside and outside surface with smooth finish.

5.5.04 C.I. FRAME AND COVER: C.I. frame and cover shall be fixed with the cement concrete 1:2:4 at the top of Gully trap chamber, the weight of frame and cover shall not be less than 7.5 kg. and they shall be painted with two coats of black bitumastic paint.

5.5.05 DEWATERING: The contract rate shall include bailing or pumping out all the water till completion or work if accumulated during the progress of work either from seepage, springs, rain or any other cause.

5.6 C.I. NAHANI / FLOOR TRAP:
5.6.01 GENERAL: The item includes supplying of cast iron nahani/floor trap with CP brass/stainless steel grating of specified diameter with fittings and fixtures including fixing and jointing with the pipe line.

5.6.02 MATERIAL: 65 mm nominal outlet dia C I Nahani trap weighing not less than 4.5 kg with an effective water seal of 20 mm or 75 mm nom. outlet dia. floor trap (100 mm inlet dia.)/nahani trap (165 mm inlet dia.) conforming to IS 3989 or IS1729 shall be provided as specified in the schedule of quantities. Top grating shall be of CP brass or stainless steel of heavy quality of size and shape to suit the trap.

5.6.03 FIXING: C.I. nahani/floor trap with the bend and pipe piece shall be fixed in position over the bed of 1:2:4 cement concrete. The jointing trap and pipe shall be caulked with 1:1 cement mortar. The grating shall be fixed over the nahani/floor trap flush with the floor level and the gap finished with matching cement.

5.7 RAIN WATER GRATING:
5.7.01 GENERAL: The item includes supplying of cast iron grating of specified diameter including fixing and painting.

5.7.02 MATERIAL: The rain water grating shall be Cast Iron with closed grained without any casting defects. The thickness should be uniform throughout, one shaped C.I. grating.

5.7.03 FIXING: C.I. rain water grating shall be fixed in position with 1:1 cement mortar.

5.8 LEAD SHEET FLASHING:
5.8.01 GENERAL: The item includes supplying lead sheet flashing of specified size including laying, fixing, cutting, jointing and laying.

5.8.02 MATERIAL: Lead sheet flashing shall not be less than 3 mm thick & weight should not be less than 38 Kg. per sqm.

5.8.03 FIXING: The lead sheet shall be fixed all around the rain water pipe. The sheet shall project one diameter of socket all-round beyond the outer face of the socket & shall project inside the socket at least half the diameter of the rain water pipe socket. It shall be fixed by bending & breaking the sheet to shape, placing, tucking below waterproofing courses etc.

5.9 RAIN WATER G.I. SPOUT:
5.9.01 GENERAL: The item includes supplying of G.I. rain water spouts of specified diameter with or without fitting at outlet including fixing. Cutting and painting.

5.9.02 MATERIAL: The rain water spout shall be of heavy quality G.I. pipe of approximate 400 mm length or as specified in the schedule of work. The ‘T’ of same diameter shall be fixed at the outlet of spout. G.I. Pipe and fitting shall be as per specifications under section IV.

5.9.03 FIXING: G.I. rain water spout shall be fixed in the position as shown in the drawing including breaking, cutting RCC parti, brick wall, RCC floor etc. It shall be fixed with 1:1 cement mortar and 1:2:4 cement concrete.

5.9.04 PAINTING: The exposed part of spout shall be painted with two coats of approved flat oil paint.
over a coat of primer.

5.10 RAIN WATER C.I. SPOUT:

5.10.01 GENERAL: The item include supplying of C.I. spouts of specified diameter including fixing, cutting, and painting.

5.10.02 MATERIAL: The spout shall be of heavy quality C.I. pipe of approximate 600 mm long or as specified in the schedule of work. Pipe shall be as per specifications of C.I. piping work under Section-V.

5.10.03 FIXING: C.I. rain water spout shall be fixed in the position including breaking, cutting RCC/ brick structure etc. It shall be fixed with 1:1 cement mortar and 1:2:4 cement concrete.

5.10.04 PAINTING: The exposed part of spout shall be painted with two coats of anticorrosive black bituminastic paint over a coat of primer.

5.12 INSPECTION CHAMBER:

5.12.01 GENERAL: The item includes provision of brick masonry Inspection Chamber of internal size as specified in the schedule.

5.12.02 MATERIAL: Concreting, Brick work, plastering etc. shall be as per specification as given in general specification.

5.12.03 CONSTRUCTION:
1. Internal dimensions and initial depth shall be as specified in the schedule or as shown in the drawing.
2. Foundation of 1:2:4 concrete shall be 150 mm thick and shall have 150 mm offset.
3. The concrete 1:2:4 shall be laid to necessary shapes to form the channel for the pipe being received in the channel. It shall be of appropriate diameter and shall be half round. The sides shall be kept sloping towards the channel.
4. Brick masonry shall be 230 mm thick in cement mortar 1:2 or as specified in the schedule of work, making brick tapering for longitudinal wall 450 mm from top of cover of the chamber.
5. Brick masonry shall be rendered with 20 mm thick plaster in cement mortar 1:1 or as specified in the schedule of work inside and outside surfaces in two courses and inside surface finished smooth with neat cement punning.

5.12.04 DEWATERING: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.13 CIRCULAR MANHOLE:

5.13.01 GENERAL: The item includes provision of brick masonry Circular manhole of internal size as specified in the schedule.

5.13.02 MATERIAL: Concreting, Brick work, plastering etc. shall be as per specification as given in general specification.

5.13.03 CONSTRUCTION:
1. Internal dimensions and initial depth shall be as specified in the schedule of work or as shown in the drawing.
2. Foundation of 1:2:4 concrete shall be 300 mm thick and shall have 300 mm offset.
3. The concrete 1:2:4 shall be laid to necessary shapes to form the channel for the pipe being received in the channel. It shall be of appropriate diameter and shall be half round. The sides shall be kept sloping towards the channel.
4. Brick masonry shall be in cement mortar 1:2 or as specified in the schedule of work. One meter height from top shall be conical in shape and shall be constructed in 230 mm thick brick masonry and remaining height shall be 345mm thick in cylindrical shape.
5. Brick masonry shall be rendered with 20 mm thick plaster in cement mortar 1:1 or as specified in the schedule of work inside and outside surfaces in two courses and inside surface finished smooth with neat cement punning.

5.13.04 DEWATERING: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.15 DROP CONNECTION:
5.15.01 GENERAL: The item includes provision of drop connection of salt glazed of nominal diameters as specified in schedule of quantities including 1:2:4 cement concrete encased to pipe all round.

5.15.02 MATERIAL: Concreting, mortars, for joining the pipes, hemp yarn, salt glazed stoneware pipes and specials like bends, tees, crosses (double tees), plugs caps etc. of specified diameter shall be of grade 'A' or 'AA' conforming to IS 651. All the pipes and fitting shall be free from pin Helen, cracks and other imperfections and should have be free from pin holes, cracks and other imperfections and should have the glossy finish in salt glazing, necessary form work for encasing the pipe.

5.15.03 DAMAGED MATERIAL: Any material found damaged or cracked shall not be used in the work and contractor has to replace the same from the site at his own cost and charges.

5.15.04 LAYING, FIXING, JOINTING, CLEANING, TESTING: Above shall be done as specified in clause 5.18.00 i.e. salt glazed stone ware piping work.

5.15.05 ENCASING THE PIPE LINE: After the joints and pipes have been proved to be water tight then pipe line shall be embedded in cement concrete as specified in the schedule of quantities and as shown in drawings including necessary form work.

5.15.06 DEWATERING: The contractor rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.17 DROP PIPE CLEANING CHAMBER:

5.17.01 GENERAL: The item includes construction of brick masonry valve chamber of size as specified in this schedule including providing M.S./G.I. frame and cover over R.C.C pre-cast cover with or without surface box.

5.17.02 MATERIAL: Brick work, plastering, concreting etc. shall be as per general specification. Precast RCC cover slab, surface box, C.I/M.S frame and cover etc. shall be size and weight as specified in the schedule.

5.17.03 CONSTRUCTION:
   a) Foundation concrete of mix 1:2:4 shall be of 150 mm thick with 150 mm offset around or as specified in the schedule.
   b) Brick masonry in cement mortar 1:2 as specified.
   c) Plastering inside and outside surfaces of walls in two courses using cement mortar 1:1 of thickness as specified mixed with water proofing compound of specified Quality including inner surfaces finished smooth with neat cement punning.

5.17.04 RCC PRECAST/CAST IRON COVERS

5.17.04.1 RCC PRECAST COVER (for chambers of size upto 600 x 600 mm):
   Chamber cover shall be casted as shown in the drawing having minimum 75 mm thick in cement concrete 1:2:4 or as specified in the schedule by using nominal reinforcement @ 100 kg/ Cum. of concrete including shuttering, finishing, curing, placing the cover in position as directed by Engineer-in-charge.

5.17.04.2 CAST IRON/ M.S COVER: Cast iron/M.S cover of specified size and weight shall be supplied and placed over the chamber as directed. The cover shall be painted with 3 coats of black bitumastic paint.

5.17.05 DEWATERING: The water accumulated in the pit due to rain, seepage, springs or any other cause during the progress of work shall be pumped/bailed out till the completion of work.

5.18 C.I. FRAME AND COVER FOR MANHOLES:

5.18.01 GENERAL: The item includes supply LD/MD/HD/EHD/C.I. frame and cover as specified in schedule including fixing and painting.

5.18.02 MATERIAL: C.I. Frame and cover shall conform to IS 1720 and shall have IS certification mark with grade LD/MD/HD/EHD and the weight of frame and cover shall not be less than as specified in the schedule.

5.18.03 FIXING: Frame shall be fixed in the cement concrete 1:2:4 for bearing course and capping on the brick masonry wall of the chamber of manhole and finishing shall be done in 1:2 cement plaster finished smooth with neat cement.

5.18.04 PAINTING: The frame and cover shall be painted with two coats of approved black bitumastic anticorrosive paint over a coat of primer.

5.19 PRECAST CONCRETE FRAME AND COVER FOR MANHOLES:
5.19.01 GENERAL: The item includes supply LD/ MD/ HD/ EHD factory made precast steel fiber reinforced concrete (SFRC) frame and cover as specified in schedule including fixing and placing.

5.19.02 MATERIAL: The precast frame and cover shall be of steel fiber reinforced concrete (SFRC) conforming to IS 12592 and shall be of approved make. The frame and cover shall be of LD/ MD/ HD/ EHD grade, size and thickness as mentioned in the description of the item. The defective Frame and cover shall be replaced by the contractor at his own cost and charges.

5.19.03 FIXING: Frame shall be fixed in cement concrete 1:2:4 for bearing course & capping on the top of masonry wall of chamber or manhole and finishing shall be done in 1:2 cement plaster finished smooth with neat cement.

5.20 CAST IRON STEPS / RUNGS:

5.20.01 GENERAL: The item includes supplying of cast iron steps including fixing and Painting.

5.20.02 MATERIAL: The steps shall be of cast iron and minimum 150 mm wide. The minimum weight of each step shall not be less than 5 kg or as specified in the schedule.

5.20.03 FIXING: The steps shall be fixed in brick masonry wall with 1:2:4 cement concrete with 75 mm cement concrete cover at all around the step. The first step shall be 450 mm below from top surface of structure and next shall be fixed 300 mm centre to centre in two rows at 300 mm distance or as shown in the drawing.

5.20.04 PAINTING: The projected portion of the cast iron step shall be painted with two coats of approved black bitumastic anti corrosive paint over a coat of primer.

5.20.05 DEWATERING: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.21 SALT GLAZED STONE WARE PIPING WORK:

5.21.01 GENERAL: The item includes supplying, laying and fixing the salt glazed Stone ware pipes with necessary fittings of specified diameter including laying, jointing etc.

5.21.02 MATERIAL: Salt glazed stoneware pipes and specials of specified diameter shall be of grade “A” or “AA” conforming to IS 651. All the pipes and fitting shall be free from pin holes, cracks and other imperfections and should have the glossy finish of salt glazing.

5.21.03 DAMAGED MATERIAL: Any material found damaged or cracked shall not be used in the work contractor has to replace the same from the site at his own cost and charge.

5.21.04 TRENCHES: The trench shall be so dug that the pipe can be laid to the required alignment and at the required depth. When the pipe line is under road way, a minimum cover of 900 mm is recommended for adoption, but it may be modified to suit local conditions. Unless otherwise specified by the Engineer-in-Charge, the width at bottom of trenches for different diameters of pipe laid at different depth shall be as given below:–

a) For all diameters, upto an average depth of 1200 mm, width of trench in mm shall be equal to diameter of pipe plus 300 mm.

b) For all diameters for depths above of 1200 mm, width of trench in mm shall be equal to the diameter of pipe plus 400 mm

c) Not withstanding (a) & (b) above, the total width of trench shall not be less than 750 mm for depths exceeding 900 mm.

The width of trench in the upper reaches shall be increased as described in sub head under “Earth Work.”

5.21.05 LAYING AND FIXING: Pipes shall be laid carefully to the correct alignment, levels and gradient and care shall be taken to prevent for entering the sand, earth or other foreign material into the pipes during laying. The pipes between manhole shall be laid truly in straight line, without vertical or horizontal undulations.

All inverts shall be laid from sight rails fixed at the true levels, with proper boning rods, The pipes shall be laid sockets facing up the gradient, alignment at the lower end and with the socket resting in the concrete bed if specified. Each pipes shall be laid singly and no pipe shall be laid until the trench has been excavated up to the required depth for a distance of 5 meter in front of the pipes to be laid.

5.21.06 JOINTING: Spun yarn soaked in cement wash shall be passed round the spigot and spigot inserted in the socket, The spun yarn shall then be caulked with 1:1 cement mortar with a little water, pressed into the joint with hand and finished at 45 degree The mortar shall be cured for seven days.

The following table shows the details of materials used for jointing the S.W. pipe.
<table>
<thead>
<tr>
<th>Internal dia of pipe (mm)</th>
<th>Depth of socket in mm</th>
<th>Depth of yarn in mm</th>
<th>Depth of C.M. paste in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>50</td>
<td>20</td>
<td>33</td>
</tr>
<tr>
<td>150</td>
<td>56</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>230</td>
<td>65</td>
<td>30</td>
<td>35</td>
</tr>
</tbody>
</table>

5.21.07 **CLEANING** : Interior surface of the pipes and fittings shall be cleaned off from all dirt, cement mortar and superfluous materials.

5.21.08 **TESTING** : The joints of S.W. Pipe line shall be tested for a minimum 600 mm water head over the crown of the highest pipe between the two manholes. The lower end shall be plugged water tight. Water shall then be filled in the inspection chamber or manhole at the upper end of the line with 600 mm depth of water over the crown. If it is found the certain pipe joints are leaking, the water shall be drained off and joints shall be reconalked.

5.21.09 **ENCASING THE PIPE LINE** : After the joints and pipes have been proved to be water tight then pipe line shall be embedded in cement concrete if specified to the extent of one half of external diameter of the pipes as directed, the concrete being made to slope away towards the sides of the foundations bed. Refilling shall be done with fine selected materials and shall be done in layers not exceeding 150mm thick, watered, consolidated and rammed properly, as specified.

5.21.10 **DEWATERING** : The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.22 **SEWER TRAP** :

5.22.01 **GENERAL** : The item includes supplying, laying and fixing the Stone ware sewer trap of specified diameter including fixing, jointing and embedding.

5.22.02 **MATERIAL** : Sewer trap shall be salt glazed of stoneware of specified diameter and shall be of grade "A" or "AA" conforming to IS 651. Sewer trap should be free from pin holes, cracks and other imperfections and should have the glossy finish of salt glazing.

5.22.03 **DAMAGED MATERIAL** : Any material found damaged or cracked shall not be used in the work and contractor has to replace the same from the site at his own cost and charge.

5.22.04 **FIXING** : Sewer trap shall be laid carefully to the correct alignment, levels and gradient and care shall be taken to prevent for entering the sand, earth or other free material into the trap during laying. The trap shall be on bedded in CC 1:2:4 including necessary form work.

5.22.05 **TESTING** : The testing shall be done along the testing of sewer line with the same specification.

5.22.06 **DEWATERING** : The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.23 **CONNECTION WITH DOMESTIC SEWER** :

5.23.01 **GENERAL** : The item includes the provisions of connecting sewer line with existing sewer line chamber or manhole including cutting, breaking of masonry, road surface and making good to the original condition of the damages.

5.23.02 **MATERIAL** : Concreting, Brick work, plastering etc. shall be as per specification as given in general specification of section II.

5.23.03 **MAKING CONNECTION** :

1. Breaking or cutting the road surface for sewer connection.
2. Restoring all the excavated items in proper manner as directed by the Engineer-in-charge
3. Cutting the brick masonry wall to required size of existing manhole or inspection chamber.
4. Connecting the sewer line to the chamber or manhole.
5. Making good to the original condition all the damages after completion of sewer connection.
6. Disposing off all the superfluous material as directed.

5.23.04 **DEWATERING** : The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.24 **CONNECTION WITH MUNICIPAL SEWER LINE** :
5.24.01 GENERAL: The item includes the provisions of connecting sewer line with existing municipal sewer line chamber or manhole including cutting, breaking of masonry, road surface and making good to the original condition of the damages.

5.24.02 MATERIAL: Concrete, brick work, plastering etc. shall be as per specification as given in general specification.

5.24.03 MAKING CONNECTION:
1. Breaking or cutting the road surface for sewer connection.
2. Restoring all the excavated items in proper manner as directed by the Engineer-in-charge.
3. Cutting the brick masonry wall to required size of municipal manhole or inspection chamber.
4. Connecting the sewer line to the chamber or manhole of Municipal sewer line.
5. Making good to the original condition all the damages after completion of sewer connection.
6. Disposing off all the superfluous materials as directed.
7. All necessary labour, materials and use of tools.

5.24.04 DEWATERING: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either from rain, seepage, springs or any other cause.

5.24.05 MUNICIPAL CHARGES: The contractor shall obtain the necessary permission for connecting the sewer line to the municipal sewer from the concerned authorities. He shall pay all necessary charges towards the connection given by the municipality.

6.0 WATER TANK, SEPTIC TANK, UPFLOW FILTER & SOAK PIT

6.1 FRAME AND COVER:
6.1.01 GENERAL: The item includes supplying of M.S. or C.I. frame with cover of size as specified in the schedule including fixing and painting. The frame and cover shall be of mosquito proof condition and approved by the Municipality.

6.1.02 MATERIAL: The frame and cover shall be of mild steel or cast iron as specified in the schedule. The weight of frame and cover shall not be less than 50 kilogram’s. They should have locking arrangement.

6.1.03 FIXING: The frame shall be fixed in the roof slab of tank or built with hold fast to R.C.C. slab by chasing or cutting slab and grouting with 1:2 cement mortar.

6.1.04 PAINTING: The frame and cover shall be painted with two coats of approved anti corrosive black bitumastic paint over a coat of approved quality primer.

6.4 BALL VALVE:
6.4.01 GENERAL: The item includes providing horizontal type ball valve with PVC or copper float of size as mentioned in the schedule including fixing.

6.4.02 MATERIAL: Horizontal plunger type ball valve with PVC or copper float shall be conforming to IS 1703. The lever shall be of brass and may be made in one piece and the diameter of the lever rod shall not be less than the diameter of the thread for boss of ball. Float shall be watertight and non-absorbent and shall not contaminate water. Adhesives for joining the part shall not be used. The minimum thickness for copper sheet of copper float shall be 0.45 mm up to 115 mm diameter and 0.55 mm for ball over 115 mm diameter. Valve shall be tested in closed position to the hydraulic pressure of 2 MPa for a minimum period of 2 minutes without leakage and sweating.

6.4.03 MINIMUM MASS: The minimum mass of finished ball valve and float of different size and class shall be as per Table No. 8 of IS 1703.

6.4.04 FIXING: Valve shall be fixed in position as indicated in the drawing with necessary socket, union nuts etc. as per site requirements. A few turns of fine hemp yam dipped in linseed oil shall be taken over the threaded ends to obtain complete water tight joint. Leaking joint if any shall be rectified to make it leak proof.

6.4.05 TESTING: Testing shall be done along with the testing of pipe line. Separate testing if required shall be done as per ISI norms.

6.6 POLYETHYLENE WATER TANK:
6.6.01 GENERAL: The item includes providing polyethylene plastic water tank with cover of capacity as mentioned in the schedule including fixing and making connections such as inlet, outlet, scour, overflow
etc.

6.6.02 MATERIAL: The water tank shall be made out of best moulded Polyethylene plastic. It shall be vertical or horizontal type as specified, water tight and non-absorbent and shall not contaminate water. Adhesives shall not be used in joints. The cover shall be of polyethylene / M.S. / C.I. as approved.

6.6.03 FIXING: The plastic water tank with cover shall be installed and fixed as per the manufacturer's specification. The connections such as inlet, outlets, over flow, scour etc. of specified diameter shall be made as mentioned in the schedule including the cost of fittings, fixtures and pipe of approximate 400 mm long.

6.8 GENERAL SPECIFICATIONS FOR WATER TANK AND SEPTIC TANK:

6.8.01 GENERAL: Construction of water tank, septic tank and up flow filter is required to be done very carefully with good quality materials. Dense, well compacted concrete of required strength has to be achieved in order to make water tight compartment. The slope in the bed of tank, invert levels of insert, and also the levels of partition and baffle walls should be properly maintained for proper flow of liquid.

6.8.02 TESTING OF WATER TANK AND SEPTIC TANK: After construction of tank, it shall be tested for leak proof ness. The tank shall be first filled with water up to the top of wall. The water level should not drop more than 50 mm within 48 hours. If the drop of water level is found more than 50 mm the defective and leakage point shall be rectified to the full satisfaction of the Engineer-in-charge.

6.8.03 COMMISSIONING OF SEPTIC TANK: Before commissioning the septic tank, a little quantity of digested sludge, horse or cow dung may be added as a seed sludge to start functioning of bacterial activity in sewage.

6.8.04 BACK FILLING: The back filling shall be done as per specification after satisfactory testing of the tanks. Back filling shall be done in layers all around the tank and above the roof slab of the tank up to the height / depth as directed by the Engineer-in-charge.

6.8.05 CLEANING OF WATER TANK: The cleaning of the tank shall be done by manually or by Hydro dynamic mechanism with low or high pressure as directed. Potable water, approved disinfectant etc. shall be used for cleaning of water tank before use.

6.8.06 DEWATERING: The contract rate shall include bailing or pumping out all the water if any accumulated during the progress of work either from rain, seepage, springs or any other cause till completion of the work.

6.9 HUME PIPE SEPTIC TANK:

6.9.01 GENERAL: The item pertains to providing Hume pipe septic tank of specified diameter with vent pipe and cap including laying, fixing and making connections.

6.9.02 MATERIAL: The Hume pipe septic tank of specified diameter and capacity with vent pipe and cap. The Hume-pipe septic tank shall be in good condition without any damage and cracks.

6.9.03 LAYING AND FIXING: Hume pipe septic tank shall be fixed in position and level as indicated in the drawing as per the manufacturer’s specifications. The pipe joints for connection shall be made in cement mortar 1:1. The vent pipe with cap shall be fixed to the septic tank. Septic tank shall be completely filled with water just before putting into use.

6.9.04 DEWATERING: The contract rate includes bailing or pumping out all the water if accumulated during the progress of work either from rain, seepage, springs or any other cause till completion of the work.

6.10 SOAK PIT:

6.10.01 GENERAL: The item pertains to providing Soak pit of specified size as mentioned in the schedule of quantities including filling with brick bats and coarse sand filling around the honey comb brick wall.

6.10.02 MATERIAL: The brick bats shall be from properly burnt bricks and not from over burnt bricks. Coarse sand filling. Brick work and plastering shall be as per general specifications.

6.10.03 CONSTRUCTION: Brick masonry shall be in cement mortar and its size and type shall be as specified in the schedule. The pit shall be filled with loosely packed brick bats. The coarse sand shall be filled around the honey comb brick wall of specified thickness.

6.10.04 DEWATERING: The contract rate includes bailing or pumping out all the water. If accumulated during the progress of work either from rain, seepage, springs or any other cause till completion of the work.