वाप्कोस लिमिटेड

WAPCOS LIMITED

(भारत सरकार का उपक्रम – जल शक्ति मंत्रालय)

(A Government of India Undertaking - Ministry of Jal Shakti)

REGIONAL OFFICE: 515, 5TH FLOOR, SHREE UGATI CORPORATE PARK, OPP. PRATIK MALL, KOBA-GANDHINAGAR ROAD, KUDASAN, DIST. GANDHINAGAR, GUJARAT-382421

TENDER DOCUMENT FOR

"CONSTRUCTION FOR GUJARAT NATURAL FARMING SCIENCE UNIVERSITY, AT JAMBUDI VILLAGE, TALUKA HALOL, PANCHMAHAL DISTRICT (GIRLS HOSTEL, KITCHEN & DINNING HALL, GUEST HOUSE, E-2 TYPE QUARTERS, B-TYPE QUARTERS, D-TYPE QUARTERS, B-B1 TYPE QUARTERS, SANITATAION WORK, COMPOUND WALL)"

WAP/ENVT/GNFSU/2023-24/02

Date: 14/02/2024

Volume-I

TECHNICAL PROPOSAL

TABLE OF CONTENT

VOLUME – I

NOTICE INVITING TENDER (NIT)

NOTICE INVITING TENDER (NIT)

NIT No. WAP/ENVT/GNFSU/2023-24/02 **Dated 14/02/2024**

WAPCOS Limited (A Govt. of India Undertaking), for and behalf of GUJARAT NATURAL FARMING SCIENCE UNIVERSITY invites "**Online Electronic Tenders"** on **"Percentage Rate basis"** from experienced and competent bidders, meeting prescribed qualifying criteria as mentioned in tender document.

1.	Name of Work / Project	:	**CONSTRUCTION FOR GUJARAT NATURAL FARMING SCIENCE UNIVERSITY, AT JAMBUDI VILLAGE, TALUKA HALOL, PANCHMAHAL DISTRICT (GIRLS HOSTEL, KITCHEN & DINNING HALL, GUEST HOUSE, E-2 TYPE QUARTERS, B-TYPE QUARTERS, D-TYPE QUARTERS, B-B1 TYPE QUARTERS, SANITATAION WORK, COMPOUND WALL)**
2.	Site / Location	:	**AT GUJARAT NATURAL FARMING SCIENCE UNIVERSITY, AT JAMBUDI VILLAGE, TALUKA HALOL, PANCHMAHAL DISTRICT, GUJARAT**
3.	Website for viewing tender	:	www.wapcos.gov.in and https://tender.nprocure.com
4.	Website for Registration/ Procurement / uploading of Tender and also viewing & procurement of the Corrigendum/ Addendum, if any.	:	https://tender.nprocure.com
5.	Estimated Cost of Work	:	**Rs. 32,49,19,450/- (Including GST)**
6.	Cost of Tender Document	:	**Rs. 24,000/-** (in form of Demand Draft in favor of WAPCOS LIMITED payable at Ahmedabad and it is not refundable)
7.	Amount of Earnest Money Deposit	:	**Rs. 64,98,389/-** (in form of Demand Draft/ FDR/Bank Guarantee (From Nationalized Bank/ Scheduled Commercial Bank, in favor of WAPCOS LIMITED payable at Ahmedabad), format for Bank Guarantee as enclosed as Annexure-XIII and it is refundable)
8.	Project Completion Period	:	**24 Months**, from the Date of Award (including Monsoon Period)
9.	Validity of Bid/Tender		120 Days
10.	Site Visit	:	Mandatory
11.	Pre Bid Meeting	:	20/02/2024, FROM 3:00 PM to onwards at Regional Office WAPCOS Ltd. Gandhinagar.
12.	Last date & time of Procurement / download of tender Document	:	**28/02/2024 up to 18:00 hours** As per the condition of e-Tendering, the bidder must officially procure/ download the tender documents from the (n) Procure Portal (https://tender.nprocure.com) in order to bid before the date and time given for procurement.
13.	Offline Submission of Technical document, Tender Fees, EMD etc. as detail in Tender for bidders**. (Hard Copy)**		**28/02/2024 up to 15:00 hours** in the office of **Sr. Project Manager (W.R.), WAPCOS Limited,** **Regional Office: 515, 5th Floor, Shree Ugati Corporate Park, opp. Pratik Mall, Koba-Gandhinagar Road, Kudasan, dist. Gandhinagar, Gujarat-382421** Email: wrdwapcosgnr@gmail.com, wapcosgandhinagar@yahoo.in,

			wapcosgandhinagar@gmail.com **Contact No. 079-23600292, 079- 23600252, +91-9898637052**
14.	Last date & time for online submission of Technical & Financial Bid	:	**28/02/2024 up to 18:00 hours**
15.	Online opening of Technical Bid	:	**29/02/2024 up to 15:00 hours**
16.	Online opening of Financial Bid	:	Intimated to Technical Qualified Bidders.
17.	WAPCOS Communication address during Tendering and execution of works	:	**Sr. Project Manager (W.R.), WAPCOS Limited**, Regional Office: 515, 5th Floor, Shree Ugati Corporate Park, Opp. Pratik Mall, Koba-Gandhinagar Road, Kudasan, Dist. Gandhinagar, Gujarat-382421 Email: wrdwapcosgnr@yahoo.com, wrdwapcosgnr@gmail.com, wapcosgandhinagar@yahoo.in, **Contact No. 079-23600292, 079- 23600252, +91-9898637052**
18.	Defect Liability Period (DLP)	:	5 Years, after handing over of the site to the University Officials. (The cost of providing the Defect Liability Service stated in the of this clause are to be borne by the contractor and shall be deemed to be included in the percentage rate quoted by the contractor)
19.	Payment Terms	:	Please Refer, **SECTION–IV (SPECIAL CONDITIONS OF CONTRACT) Clause No. 48**
20.	Registration Class		Scanned copy of Bidder's registration certificate of "AA" Class Category Building-1 or above in Govt. of Gujarat (R&B) and for others as mentioned below : CPWD/Railway and other State Governments equivalent to "AA" class Category Building-1 or above of Gujarat State/Other Contractors who are registered in Board, Corporation, and Government Undertaking/Organizations of state & central government including all Public Sector Units equivalent to "AA" Class Category Building-1 or above of Gujarat state having the above stated criteria, such Contractor shall have to apply on or before the last date of submission of Tender documents to get himself registered in "AA" class Category Building-1 or above in Government of Gujarat R&B and obtain registration in "AA" class or above before the date of finalization of work order of Project Contract to be issued, if awarded. The proof of application for Registration in "AA" Class, Category Building-1 or above shall have to be uploaded with the Tender documents
If the office of WAPCOS Limited, Gandhinagar happens to be closed on the last date and time mentioned for any of the event, the said event will take place on the next working day at the same time and venue.			

The tender document has to be downloaded from above specified website. Bidders are advised to visit above specified website regularly for updates/ Amendments/ Corrigendum, if any. The Updates/Corrigendum/Addendum shall be followed up to submission of tender and it will be the part of

tender. The full details about the work, specifications, Drawings, terms and conditions shall be available in the Tender Document. The tender document has to be submitted online on websites https://tender.nprocure.com

The purpose of this NIT is to provide interested parties with information to assist the preparation of their bid. While WAPCOS Limited has taken due care in the preparation of the information contained herein, and believe it to be complete and accurate, neither it nor any of its authorities or agencies nor any of its respective officers, employees, agents or advisors give any warranty or make any representations, expressed or implied as to the completeness or accuracy of the information contained in this document or any information which may be provided in association with it.

Further, WAPCOS Limited does not claim that the information is exhaustive. Respondents to this NIT are required to make their own inquiries/ surveys and will be required to confirm, in writing, that they have done so and they did not rely solely on the information in NIT. WAPCOS Limited is not responsible if no due diligence is performed by the bidders.

IMPORTANT POINTS

1.1 The bidder should be an Indian Registered Company under Companies Act 1956/2013/Registered Proprietorship Firm/ registered Partnership Firm.

1.2 Joint Venture/ consortiums are strictly not allowed.

1.3 All Bidders are hereby cautioned that Bids containing any deviation or reservation as described in Clauses of "Instructions to Bidders" shall be considered as non-responsive and shall be summarily rejected.

1.4 WAPCOS Ltd. reserves the right to accept or reject any or all bids without assigning any reasons. No Bidder shall have any cause of action or claim against the WAPCOS Ltd. For rejection of his Bid and will not be bound to accept the lowest or any other tender.

1.5 No reimbursement of cost of any type or on any account will be paid to persons or entities submitting their Bid.

1.6 All information submitted in response to this NIT shall be the property of WAPCOS Limited and it shall be free to use the concept of the same at its will.

1.7 It is hereby declared that WAPCOS is committed to follow the principle of transparency, equity and competitiveness in public procurement. The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily rejected. This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the WAPCOS.

1.8 After the final selection, The qualify tenderer must has to submit the Tender Document including addenda/ corrigendum to the ***"Additional Chief Engineer", WAPCOS Limited, Regional Office: 515, 5th Floor, Shree Ugati Corporate Park, Opp. Pratik Mall, Koba-Gandhinagar Road,Kudasan, Dist. Gandhinagar, Gujarat-382421***

For and on behalf of WAPCOS LIMITED
Sr. Project Manager (W.R)
WAPCOS Gandhinagar

Project Background

The project (Construction For Gujarat Natural Farming Science University, At Jambudi Village, Taluka Halol, Panchmahal District site located at Jambudi village, Halol Taluka, Panchmahal district comprises 23.00 Ha land near Pavagadh Hills. The work comprises Construction of various building in proposed campus i.e. University Bhavan, P.G. Institute, Modern Organic Farming Training Center, Boys & Girls Hostel, E2 Type Quarters, VC residence, Sport Complex, Museum, Auditorium, Farm Structure, Guest House and other infrastructure facilities.

Out of the above building & infrastructure, the current tender covers, Girls Hostel, Kitchen & Dinning Hall, Guest House, E-2 Type Quarters, B-Type Quarters, D-Type Quarters, B-B1 Type Quarters, Sanitation Work, Compound Wall.

Girls Hostel: This Block has been positioned behind to the Right Side of P.G Institute of the proposed area. There are 1-TV room, 1-Indoor Games Room, 1-Music room, 1-Storeroom, 1-office room, 1-warden room, 2-physically challenge room, 2-pantry, 7-single occupancy room, 27-Double occupancy room.

Kitchen & Dinning Hall:- This Block has been positioned between boys and Girls Hostel. Dining hall, drinking water area, Kitchen, store, wash area and W/C.

Guest House: This Block has been positioned at the Entry area of university. It Consist of G+1 Building. In Ground Floor 6 Rest room, VIP Dinning hall, Dining hall & Reception area & First Floor 6 Rest Room, Conference room & Store room.

E-2 Type quarters: This Block has been positioned behind the Dr. Residency. It Consist of G+1 Building. In Ground Floor office, living room, kitchen- dining room, bed room, office & toilet and at First Floor 2 master bed room & toilet and terrace.

B-Type Quarters: This Block has been positioned behind the Dr. Residency. It Consist of Ground floor Building. In Ground living room, Kitchen- dining room, bed room and terrace.
D-Type Quarters: The carpet area is 60.34 meter square. This Block has been positioned behind the Dr. Residency. It Consist of G+6 Building. It consist of four unit each floor of 2 bed room hall kitchen.

B&B1-Type Quarters: The carpet area is 45.81 meter square. This Block has been positioned behind the Dr. Residency. It Consist of G+6 Building. It consist of four unit each floor of 2 bed room hall kitchen.

Sanitation Work: Sanitation work for University Bhavan, P.G Institute, Boys Hostel, MOFTC, V.C & Dr. residency. Sewage network, soak well & Septic tank.

Compound Wall: Extension of existing compound wall, length of 35m.

SECTION– I
INSTRUCTIONS TO BIDDER

SECTION– I
INSTRUCTIONS TO BIDDER

1.1 Instructions for Online Bid Submission

The bidders are required to submit soft copies of their bids electronically on the https://tender.nprocure.com using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the (n) Procure Portal, prepare their bids in accordance with the requirements and submitting their bids online on the (n)Procure Portal.

More information useful for submitting online bids on the (n)Procure Portal may be obtained at: https://tender.nprocure.com

- Bidders can download the tender document free of cost from the website.
- Bidders have to submit Technical bid as well as Price bid in Electronic format only on above-mentioned website till the Date & time shown above.
- Offers in physical form will not be accepted in any case.

Bidders who wish to participate in online tenders will have to procure / should have legally valid Digital Certificate as per Information Technology Act-2000 using which they can sign their electronic bids. Bidders can procure the same from any of the license certifying Authority of India or can contact (n) code solutions- a division of GNFC Ltd, who are licensed Certifying Authority by Govt. of India.

All bids should be digitally signed, for details regarding digital signature certificate and related training involved the below mentioned address should be contacted:

(n)Code solutions
A division of GNFC
301, GNFC Info tower, Bodakdev,
Ahmedabad- 380 054 (India)
Tel : +91 26857316/17/18
Fax: +91 79 26857321
E-mail: nprocure@gnvfc.net
Mobile: 9898540855, 9898589652

1.2 BID SUBMISSION

The entire bid-submission would be online process through (n)Procure Portal of submissions are as follows:

- Technical Bid (Envelope-I of the Tender Document)
- Financial Bid (Envelope-II of the Tender Document)

1.3 OFFLINE SUBMISSION OF DOCUMENTS BY BIDDER

The Bidder shall submit following document offline in separate sealed envelopes also.

- **Technical Qualification Documents in original as mentioned in "Section-II - Selection and Qualifying Criteria"**
- **Tender Document fee in the form of Demand Draft as per Annexure- III.**

1.4 MINIMUM REQUIREMENTS AT BIDDER'SEND

Computer System having configuration with minimum Windows 7 or above and Broadband Connectivity.

- Microsoft Internet Explorer 7.0 or above
- Digital Certificate (s)

2 INSTRUCTION TO BIDDER

The purpose of these instructions to serve as a guide to Bidders for preparing offer for carrying out the project in all respect.

a) The Schedule of Quantity is given in Annexure-I. The tenderer has to quote their offer in Percentage Rate in Schedule of Quantities. The Percentage - Rate shall be quoted up to 2 decimals. The tenderer shall quote rate(s) in figures as well as in words. In case of any discrepancy between the two, rate(s) quoted in words shall prevail. In case of discrepancy between quoted rate and amount, rate shall prevail. The payment will be made as per the actual work done and item wise measurement basis. Bidders are advised to examine the available Cost Index/Market Rate while submitting the tender.

b) Bidders are advised to quote their rates including the mobilization of equipment/ lead/lift/carriage of material at site as per the site conditions. No request for the lead/lift carriage shall be considered after the award of the work.

c) Submission of a tender by a tenderer implies that the tenderer has read this notice and all other Tender Documents and has made aware of the scope, the specifications, and conditions of contract, local conditions and other factors having bearings on the execution of the work.

d) WAPCOS Limited desires that the bidders, suppliers, and Sub-contractors under the Project; observe the highest standard of ethics during the performance, procurement and execution of such contracts. In pursuance of this requirement, WAPCOS Limited, defines, for the purposes of this provision, the terms set forth below:

   i. “Corrupt Practice” means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

   ii. “Fraudulent Practice” means any act of submission of forged documentation, or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation, or to succeed in a competitive bidding process;

   iii. “Coercive Practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of party;

   iv. “Collusive Practice” means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.

   v. Will reject the award of Contract, even at a later stage, if it determines that the bidder recommended/selected for award /awarded has, directly or through an agent, engaged in Corrupt, Fraudulent, Collusive, Or Coercive Practices in competing for the Contract; Will sanction a party or its successors, including declaring ineligible, either indefinitely or for a stated period of time, to participate in any further bidding/ procurement proceedings under the Project, if it at any time determines that the party has, directly or through an agent, engaged in Corrupt, Fraudulent, Collusive, Or Coercive Practices in competing for, or in executing, the contract.

   vi. The party may be required to sign an Integrity Pact, if required; and WAPCOS Limited will have the right to require the bidders, or its suppliers,
   contractors and consultants to permit WAPCOS Limited to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by WAPCOS Limited at the cost of the bidders.

   vii. The Bidder must obtain for himself on his own responsibility and at his own expenses all the information which may be necessary for the purpose of making a bid and for entering into a contract, must examine the Drawings, must inspect the sites of the work, acquaint himself with all local conditions, means of access to the

work, nature of the work and all matters pertaining thereto. WAPCOS Limited will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

viii. The Contract shall be governed by each SECTION OF TENDER DOCUMENT i.e. instructions to bidders, selection & qualifying criteria, scope of works, General Conditions for Contract (GCC), Special Conditions for Contract (SCC), Annexures, Forms, Drawings, Technical Specification, Addendum / Clarification / Corrigendum etc. and all other Conditions mentioned in the tender documents.

ix. All Bidders are hereby explicitly informed that conditional offers or offers with deviations from the Conditions of Contract, the bids not meeting the minimum eligibility criteria, Technical Bids not accompanied with Tender Document Fees & EMD of requisite amount in acceptable format, Bids in altered/ modified formats, or in deviation with any other requirements stipulated in the tender documents are liable to be rejected.

x. The bidders shall not tamper or modify any part of the tender documents in any manner. In case in part of the bid is found to be tampered or modified at any stage, the bids are liable to be rejected, the contract is liable to be terminated and the full earnest money deposit /retention money/ performance guarantee will be forfeited and the bidder will be liable to be banned from doing any business with WAPCOS Limited

xi. Incomplete Price bid shall be liable to be rejected, at the discretion of WAPCOS Limited. The total bid price shall cover the entire scope of works covered in the tender.

3 EARNEST MONEY DEPOSIT (EMD)

As per Dept. of Expenditure, Ministry of Finance, Govt. of India guidelines, the bidder has to submit a in lieu of the EMD, which shall be submitted along with the Technical Bid Envelope. The Tender Processing Fee shall be submitted as per the details mentioned in the NIT. The bids without Tender Processing Fee shall be summarily rejected and shall not be evaluated further. In case tenderer revokes, cancels, or varies his tender in any manner without the consent of WAPCOS Limited, within this period, Bidder will be debarred from participating in the future bidding process for two years.
EMD is return to unsuccessful bidder when work order is issue to L1 bidder. For successful bidder, EMD to be return on receipt of PBG.

4 COST OF BIDDING

The Bidder shall bear all costs associated with the preparation & submission of the Bid as well as costs associated for facilitating the evaluation. WAPCOS Ltd. shall in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

5 LANGUAGE OF BID

The Bid and all related correspondence and documents relating to the Project shall be in English language only. Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied by an accurate English translation which shall be certified by a qualified translator. Any material that is submitted in a language other than English and which is not accompanied by an accurate English translation will not be considered.

6 CURRENCY OF BID

Bid prices shall be quoted in Indian Rupees only.
Tender submitted by tenderer shall remain valid for acceptance as mentioned in NIT from the date set for submission of the tender. The tenderer shall not be entitled with in the said period to revoke or cancel or vary the tender given or any item thereof, without the consent of WAPCOS Limited. In

case tenderer revokes, cancels, or varies his tender in any manner without the consent of WAPCOS Limited, within this period, his earnest money will be forfeited.

7 ANNEXURES

The successful Bidder shall submit the following documents and follow the guidelines asper **"Section of Annexures"** mentioned in tender document.

ANNEXURE - I: FORMAT FOR PERFORMANCE SECURITY
ANNEXURE - II: FORMAT FOR ADVANCE PAYMENT BANK GUARANTEE
ANNEXURE - III: FORMAT FOR INDENTURE FOR SECURED ADVANCES
ANNEXURE - IV: FORMAT FOR SEEKING EXTENSION OF TIME
ANNEXURE - V: FORMAT FOR GUARANTEE BONDS / AFFIDAVIT FOR WORK
ANNEXURE-VI: FORMAT FOR GUARANTEE BOND FOR WATER PROOFING TREATMENT
ANNEXURE -VII: FORMAT FOR GUARANTE BONDS FOR ANTI-TERMITE TREATMENT
ANNEXURE - VIII: SAFETY CODES
ANNEXURE-IX: MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS
ANNEXURE - X: CONTRACTOR's LABOUR REGULATIONS
ANNEXURE- XI: ~~BID SECURITY DECLARATION~~
ANNEXURE- XII: CONTRACT AGREEMENT
ANNEXURE- XIII: BANK GUARANTEE FORMAT FOR EMD

WAPCOS Limited reserves the right to reject any or all the bids or to cancel the Tender, without assigning any reason(s) whatsoever.

For & on behalf of Tender

~~**Annexure-I**~~

~~**BID SECURITY DECLARATION**~~

DELETED

SECTION– II
SELECTION AND QUALIFYING CRITERIA

SECTION-II

SELECTION AND QUALIFYING CRITERIA

1.0 SITE VISIT –MANDATORY

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

Site visit is mandatory, to understand the actual scope of work/ site condition and will be held as dates and time mentioned in NIT of this tender in the presence of WAPCOS representative. Accordingly, it is directed to bidders to visit the site with proper authorization letter of bidder representative from Bidder Company/ agencies. Bidder representative will submit the authorization letter to WAPCOS representative.

2.0 PRE-BID MEETING

(20/02/2024, FROM 3:00 PM to onwards) at Regional Office WAPCOS Ltd. Gandhinagar. 515, 5th Floor, Shree Ugati Corporate Park, Opp. Pratik Mall, Koba-Gandhinagar Road, Kudasan, Dist. Gandhinagar, Gujarat-382421.

3.0 QUALIFYING CRITERIA: ONLINE TECHNICAL BID SUBMISSION

The intending bidders must read the terms & conditions of tender documents carefully. He should only submit his technical bid if he considers himself eligible and he is in possession of all the documents required.

The Technical Bid shall be uploaded **with colored scanned copies of following documents. All the documents must be Serial wise as stated below along with check list and clearly marked page no. on each page *(MANDATORY*).**

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
a)	Authorization Letter to sign the Tender on bidder's original letter head or Power of attorney			
b)	Scanned copy of EMD of amount as mentioned in NIT.			
c)	Scanned copy of Demand Draft for Tender Fees of the amount as mentioned in NIT.			
d)	Letter of Transmittal on bidder's original letter Head to submit Technical Bid.			
e)	Yearly sales Turnover and Audited Balance Sheet for Last 5 (five) years ending on the financial year 2022-23			
	• The contractor should not have incurred any loss (profit after tax should be positive) in more than two years during last five years ending 2022-23 duly audited and ***Attested by the Independent Chartered Accountant***. **(Form-A)**			
	• **Turnover:** Average annual financial turnover **on Construction works** should be at least 50% of the estimated cost of work during the immediate last 3 consecutive financial years ending 2022-23. This should be duly audited by the Chartered Accountant doing Statutory Audit with UDIN number.			
	• Full Balance Sheet and Profit & loss Statement of Bidder should be verified by Chartered Accountant.			
	• The contractor should also have satisfactorily completed the similar types of works as mentioned below during the last seven years ending previous day of last date of submission of tender.			
	i) One similar completed work costing not less than 80% of the estimated cost of work. Or ii) Two similar completed works of order value each not less than 50% of the estimated cost of work. Or iii) Three similar completed works of order value not less than 40% of the estimated cost of work. Note: "Similar work" refers to a work involving Building works comprising of Construction of non-residential buildings / institutional / commercial of minimum RCC framed structure with provision of Plumbing Works, Electrical and all other requisite works of "Government / Semi Government, Central PSUs/State PSUs/Central Autonomous Bodies". The bidder's shall submit Completion Certificate(s) mentioning name, nature of work(s), value(s) of the job(s), date(s) of commencement, stipulated date(s) of completion and actual date(s) of completion along-with LOI(s)/W.O(s) from respective Owner(s)/Client(s).			

<table>
<tr><th colspan="5">Format of Check List</th></tr>
<tr><th>S.N</th><th>Particular of Document</th><th>Yes</th><th>No</th><th>Page Nos. (from – to)</th></tr>
<tr><td></td><td>iv) Following enhancement factors will be used for the cost of works executed to arrive to a common base for the value of the works completed. Below multiplying factor is only applicable if work is fully (100%) completed year before.
<table>
<tr><th>Year</th><th>Multiplying factor</th></tr>
<tr><td>One (2022-2023)</td><td>1.10</td></tr>
<tr><td>Second (2021-2022)</td><td>1.21</td></tr>
<tr><td>Third (2020-2021)</td><td>1.33</td></tr>
<tr><td>Four (2019-2020)</td><td>1.46</td></tr>
<tr><td>Five (2018-2019)</td><td>1.61</td></tr>
<tr><td>Six (2017-2018)</td><td>1.77</td></tr>
<tr><td>Seven (2017-2018)</td><td>1.95</td></tr>
</table></td><td></td><td></td><td></td></tr>
<tr><td>f)</td><td>The bidder should not be insolvent, in receivership, bankrupt or being wound up, not have had their business activities suspended. Accordingly, Bidder shall submit Solvency certificate with details of Financial Status i.e. Name of the Banker & Current Solvency from Banker for a sum of at least 40% of the estimated cost of work, Certificate in Original from a Nationalized Bank/ Scheduled Commercial Bank. Solvency certificate must have been issued after the date of publication of NIT & before last date of submission and be addressed to the tendering authority quoting the name of the work.</td><td></td><td></td><td></td></tr>
<tr><td>g)</td><td>Name, Address, details of the Organization, Name(s) of the Owner/Partners/Promoters and Directors of the firm / company. (Form-B)</td><td></td><td></td><td></td></tr>
<tr><td>h)</td><td>Copy of P.F and PAN Number.</td><td></td><td></td><td></td></tr>
<tr><td>i)</td><td>Goods and Service Tax (GST): Bidders are advised to get themselves registered for GST in Gujarat, which is mandatory, as per Govt. of India notification regarding GST. Accordingly bidder shall submit relevant documents if already registered. If not registered till date of submission of bid, bidder will give undertaking on bidder letter head stating that they will get registered in GST as per Govt. norms within 7 days of receipt of LOA.</td><td></td><td></td><td></td></tr>
<tr><td>j)</td><td>The bidder should be an Indian Registered Company under Companies Act 1956/ Proprietorship Firm/ Partnership Firm. Joint Ventures are not accepted. Copy of Certificate of Incorporation /Registration /Partnership Deed Registration or any other relevant document, as applicable, should be submitted along with a copy of address proof.
<u>NOTE:</u> Proprietor firms shall submit registration details or shall submit the copy of relevant page of Passbook for the Current Account in the name of Proprietor Firm.</td><td></td><td></td><td></td></tr>
</table>

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
k)	Bidder shall submit the **Undertaking Regarding Blacklisting / Non- Debarment.** Bidder should not be blacklisted/ debarred by any Government/ semi Government Department/ PSU. Bidders shall give undertaking for not being involved in any form of corrupt and Fraudulent practices. **(Form-C).**			
l)	Letter of understanding the project site on bidder letter Head **(Form-D).**			
m)	'No Deviation Certificate' in prescribed format in Bidder's Letter Head **(Form-E).**			
n)	Consent Letter to execute the Integrity Pact **(Form-F).**			
o)	Bidder shall submit Information on litigation history, liquidated damages, disqualification etc. in bidder Letter Head **(Form-G)**.			
p)	Each page of the all Volume of Tender document & Addendum/ Corrigendum shall be Digitally signed by the bidders submitting the Tender in token of his/their having acquainted himself/ themselves and accepted the entire tender documents including various conditions of contract. Any Bid with any of the Documents not so signed is liable to be rejected at the discretion of WAPCOS Limited.***(Do Not Submit with the document of Offline Submission)***			
q)	The bidder shall submit the Resume of Proposed Personnel to be deployed for the project as per Clause 36 (i) (**Form H)**			
r)	Scanned copy of Bidder's registration certificate of "AA" class Category Building-1 or above in Govt. of Gujarat (R&B) and for others as mentioned below : CPWD/Railway and other State Governments equivalent to "AA" class Category Building-1 or above of Gujarat State/Other Contractors who are registered in Board, Corporation, and Government Undertaking/Organizations of state & central government including all Public Sector Units equivalent to "AA" Class Category Building-1 or above of Gujarat state having the above stated criteria, such Contractor shall have to apply on or before the last date of submission of Tender documents to get himself registered in "AA" class Category Building-1 or above in Government of Gujarat R&B and obtain registration in "AA" class or above before the date of finalization of work order of Project Contract to be issued, if awarded. The proof of application for Registration in "AA" class Category Building-1 class or above shall have to be uploaded with the Tender documents			
s)	**Mandatory site visit condition** i. Bidder or its authorized representative should visit the site in actual (on any day between the date of publishing of tender and the last date of submission of bid on portal) and upload a self-certified site visit certificate as per format given as Letter of understanding			

Format of Check List				
S.N	**Particular of Document**	**Yes**	**No**	**Page Nos. (from – to)**
	the project site on bidder letter head **(Form-I).** i. Bidder is also to upload a minimum 4 Geo-stamped Photographs of the site (as a proof of having complied with the mandatory site visit condition) on the portal (containing the date/time, Geographic coordinates i.e. Latitude and Longitude coordinates at the place of site) from the widely used android / iOS apps such as a Google Map. – Proposed Gujarat Natural Farming Science University site at Halol, dist. Panchmahal (22°29'29.36"N, 73°29'47.71"E) ii. Bidder must also upload at least 01 No. of Photograph containing his/her own photograph in front of the existing permanent structure at the Project site. i.e. – Proposed Gujarat Natural Farming Science University site at Halol, dist. Panchmahal (22°29'29.36"N, 73°29'47.71"E) Bidders who fail to submit / upload the self-certified site visit certificate and the requisite no. of photographs in the manner as described under Sr. No. (i), (ii) above on the Portal along with the bid documents, will be treated as technically disqualified.			

No information relating to financial terms of services should be included in the technical bid. Bids are to be submitted to determine that the bidder has a full comprehension of the tendered work. Where a bidder technical submittal is found non - compliant with the requirement of work, it may be rejected. This process is to assure that only technical acceptable bids are considered for the tendered work.

Contractors who fulfill the above requirements shall be eligible to apply.

4.0 OFFLINE SUBMISSIONS OF TECHNICAL DOCUMENTS

The Bidder shall submit following Technical Document offline also.

1. **All the documents in ORIGINAL, mentioned in "Section-II: Selection and Qualifying Criteria" in Para 3: Qualifying Criteria for Technical Bid i.e. at Sr. No. (a) to (q) along with checklist & page numbering *(MANDATORY), Signed & Stamped on Each Page*** in separate sealed envelope clearly labeled as "TECHNICAL BID" for the Work (Write Name of Work/Project as mentioned in NIT) along with Details of Bidders Address, Phone, E-mail on Envelope.(***Do Not Submit document at Sr. No. (p) Above, with the document of Offline Submission).***

2. **Originals EMD and Tender submission fee in the form of Demand Draft/FDR/Bank Guarantee** in separate sealed envelope clearly labeled as "EMD AND TENDER FEE" for the work (Write Name of Work/Project as mentioned in NIT) along with Details of Bidders Address, Phone, E-mail on Envelope.

5.0 CONTENTS OF FINANCIAL BID

The Financial Bid should be uploaded separately along with Technical bid before last date & time of submission of Tender Document.

The estimated cost mentioned in NIT is based on the SOR provisions and Nonscheduled items as per the standard practice. The bidder shall quote rates of all BOQ items keeping in view all associated costs with the project including any out of pocket / mobilization expenses/ Custom duty (if any), Buildings and other construction workers welfare cess, TDS and taxes (GST) if any applicable as per Govt. terms, by the Contractor.

It is mandatory to bidders to deposit GST within time limit framed by Govt. of India, if applicable. While raising invoices, the bifurcation of basic amount + GST should be mentioned. The Goods

and Services Tax (GST) amount shall be reimbursed to the Agency only after GST payment & uploading of bills by Contractor on GST Portal "to avail Input benefit of GST".

The company shall be performing all its duties of deduction of TDS and other deduction on payment made to the contractor as per applicable legislation in force on the date of submission of bid or to be newly / amended introduced during the execution of the Contract.

The Bill of quantity of tender is uploaded on online, bidder shall fill the percentage rates online only.

6.0 OPENING OF FINANCIAL BID

The financial bids of the technically qualified bidders shall be opened at the notified date & time mentioned in NIT.

7.0 AWARD CRITERIA

After closing of Technical & Financial Bid process, WAPCOS Ltd. will award, the contract to the bidder, whose tender has been determined to be substantially responsive, complete and in accordance with the tender document, and whose total evaluation price for the undertaking the project as detailed in the scope of work is the lowest. If the financial bids of lowest two bidders are equal, then the tender will be treated as cancelled and shall be re-tendered as per the WAPCOS rules.

For & on behalf of Tenderer

SECTION– III
GENERAL CONDITIONS OF CONTRACT

SECTION– III
GENERAL CONDITIONS TO CONTRACT

1.0 GENERAL RULES AND DIRECTIONS

General Rules & Directions	1.	The work proposed for execution by contract will be notified in a form of invitation to tender by posted on website. This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit and Performance guarantee to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills.
	2.	In the event of the tender being submitted by a Partnership firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a Power of Attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.
	3.	Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm
	4.	Any person who submits a tender shall fill up the usual printed form, stating at what percentage rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes. The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paisa and considering more than fifty paisa as rupee one. In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more contractors is same, then such lowest contractors may be asked to submit sealed revised offer quoting rate of each item of the schedule of quantity for all sub sections/sub heads as the case may be, but the revised quoted rate of each item of schedule of quantity for all sub sections/sub heads should not be higher than their respective original rate quoted already at the time of submission of tender. The lowest tender shall be decided on the basis of revised offer. If the revised tendered amount (worked out on the basis of quoted percentage rate of individual items) of two or more contractors received in revised offer is again found to be equal, then the lowest tender, among such contractors, shall be decided by draw of lots in the presence of official of WAPCOS & GNFSU and the lowest contractors those have quoted equal amount of their tenders. In case of any such lowest contractor in his revised offer quotes percentage rate of any item more than their respective original percentage rate quoted already at the time of submission of tender, then such revised offer shall be treated invalid. Such case of revised offer of the lowest contractor or case of refusal to submit revised offer by the lowest contractor shall be treated as withdrawal of his tender before acceptance and 50% of his earnest money shall be forfeited. In case all the lowest

		contractors those have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractors. Contractor, whose earnest money is forfeited because of non-submission of revised offer, or quoting higher revised rate(s) of any item(s) than their respective original rate quoted already at the time of submission of his bid shall not be allowed to participate in the retendering process of the work
Applicable	4A	In case of Percentage Rate Tenders, contractor shall fill-up the usual printed`form, stating at what percentage below/above (in figures as well as in words) the total estimated cost given in Schedule of Quantities, he will be willing to execute the work. The tender submitted shall be treated as invalid if :- 1. The contractor does not quote percentage above/below on the total amount of tender or any section/subhead of the tender. 2. The percentage above/below is not quoted in figures & words both on the total amount of tender or any section/sub head of the tender. 3. The percentage quoted above/below is different in figures & words on the total amount of tender or any section/sub head of the tender. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes
Applicable	4B	In case the lowest tendered amount (estimated cost + amount worked on the basis of percentage above/ below) of two or more contractors is same, such lowest contractors will be asked to submit sealed revised offer in the form of letter mentioning percentage above/ below on estimated cost of tender including all subsections/ subheads as the case maybe, but the revised percentage quoted above/ below on tendered cost or on each subsection/sub head should not be higher than the percentage quoted at the time of submission of tender. The lowest tender shall be decided on the basis of revised offers. In case any of such contractor refuses to submit revised offer, then it shall be treated as withdrawal of his tender before acceptance and 50% of earnest money shall be forfeited. If the revised tendered amount of two more contractors received in revised offer is again found to be equal, the lowest tender, among such contractors, shall be decided by draw of lots in the presence of official of WAPCOS & GNFSU and the lowest contractors those have quoted equal amount of their tenders. Incase all the lowest contractors those have quoted same tendered amount, refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each contractor. Contractor(s), whose earnest money is forfeited because of non-submission of revised offer, shall not be allowed to participate in the re-tendering process of the work.

	5.	The designated committee will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents. In the event of a tender being rejected, the earnest money shall thereupon be returned to the contractor remitting the same, without any interest.
	6.	WAPCOS shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender
	7.	The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgment or payment to the officer inviting tender and the contractor shall be responsible for seeing that he procures a receipt signed by the officer inviting tender or a duly authorized Cashier.
	8.	~~The memorandum of work tendered for and the schedule of materials to be supplied by the WAPCOS and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.~~
	9.	The tenderers shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them.
	9A	Use of correcting fluid, anywhere in tender document is not permitted. Such tender is liable for rejection
	10.	In the case of Percentage Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below/ above the rates quoted is liable to be rejected. Rates quoted by the contractor in percentage rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the percentage rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount. In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this/ these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.
APPLICABLE	10A	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 contractor in percentage rate tender shall be accurately filled in figures and words, so that there is no discrepancy
	11.	In the case of any tender where unit rate of any item/ items/percentage rate appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.
	12.	All percentage rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in

		such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs.' should be written before the figure of rupees and word 'P' after the decimal figures, e.g. 'Rs. 2.15 P' and in case of words, the word, 'Rupees' should precede and the word 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word 'only' it should invariably be upto two decimal places. While quoting the rate in schedule of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.
APPLICABLE	12A	In Percentage Rate Tender, the tenderer shall quote percentage below/ above (in figures as well as in words) at which he will be willing to execute the work. He shall also workout the total amount of his offer and the same should be written in figures as well as in words in such a way that no interpolation is possible. In case of figures, the word 'Rs.' should be written before the figure of rupees and word 'P' after the decimal figures, e.g. 'Rs.2.15 P and in case of words, the word 'Rupees' should precede and the word 'Paisa' should be written at the end..
	13.	i. The Contractor, whose tender is accepted, will be required to furnish performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in Special Conditions of Contract. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10,000/-) or Deposit at call receipt of any Nationalized bank/ Banker's cheque of any Nationalized bank/ Demand Draft of any Nationalized bank/ Pay order of any Nationalized bank (in case guarantee amount is less than Rs. 1, 00,000/) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Nationalized bank or the State Bank of India in accordance with the prescribed form. ii. The contractor whose tender is accepted will also be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 2.5% of the tendered value of the work. The Security deposit will be collected by deductions from the running bills as well as final bill of the contractor at the rates mentioned above. The Security amount will also be accepted in cash or in the shape of Government Securities. Fixed Deposit Receipt of a nationalized bank or State Bank of India will also be accepted for this purpose provided confirmatory advice is enclosed.
	14.	On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.
	15.	All the taxes Including GST applicable in respect of this contract shall be payable by the Contractor and WAPCOS will not entertain any claim whatsoever in respect of the same.
	16.	The contractor shall give a list of WAPCOS employees related to him.
	17.	The tender for the work shall not be witnessed by a contractor or contractors who himself/themselves has/have tendered or who may and has/have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.
	18.	The tender for composite work includes, in addition to building work, all other works such as sanitary and water supply installations drainage installation, electrical work, horticulture work, roads and paths etc. **The tenderer apart from being a registered contractor of appropriate 'AA' class category building-1 or Above,** must associate himself with agencies of appropriate class which are

<table>
<tr><td></td><td></td><td colspan="5">eligible to tender for sanitary and water supply drainage, electrical and horticulture works in the composite tender.</td></tr>
<tr><td rowspan="5">APPLICABLE</td><td>19.</td><td colspan="5">The contractor shall submit list of works which are in hand/ongoing project in the following form :-</td></tr>
<tr><td></td><td>Name of Work</td><td>Name and particulars where work is being executed</td><td>Value of Work</td><td>Position of works in progress</td><td>Remarks</td></tr>
<tr><td></td><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td><td>(5)</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>20.</td><td colspan="5">The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the contract and WAPCOS may in his discretion, without prejudice to any other right or remedy available in law, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.</td></tr>
</table>

2.0 CONDITIONS OF CONTRACT

Definitions	1.	The Contract means the documents forming the tender and acceptance thereof and the formal agreement executed between the WAPCOS 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.
	2.	In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:- "Employer" shall mean "WAPCOS Limited", A Government of India undertaking- Ministry of Jal Shakti, for execution of the Work / Project as mentioned in NIT. i. having their Registered office at 5th floor, Kailash building, 26-Kasturba Gandhi Marg, New Delhi-110001, India & include their successors & permitted assigns as well as their authorized officer / representatives ii. The "COMPANY / WAPCOS" shall mean WAPCOS Limited. iii. 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. iv. The **Site** shall mean the land/or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract. v. The **Bidder/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 who are participating in Bidding process and will Execution the project after award of the works as Contractor. vi. The **Engineer-in-Charge** means the Engineer Officer appointed by WAPCOS or his duly authorized representative who shall direct, supervise and be in-charge of the work for the purpose of this Contract vii. **Accepting Authority** shall mean the authority mentioned in Special Conditions of Contract. viii. **Tenderer/ Bidder** shall mean the firm/party who intends to participate in this Notice Inviting Tender ix. **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by Government of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to Government's faulty design of works.

		x. **Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Special Conditions of Contract to cover, all overheads and profits. xi. **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the government mentioned in Special Conditions of Contract hereunder, with the amendments thereto issued upto the date of receipt of the tender. xii. **District Specifications** means the specifications followed by the State Government in the area where the work is to be executed. xiii. The **Contractor/Successful Bidder** shall mean the firm or company whose bid has been accepted by WAPCOS. xiv. **Consultant** shall mean any consultant nominated by the WAPCOS. xv. **Tendered value** means the value of the entire work as stipulated in the letter of award. xvi. **Date of commencement of work:** The date of commencement of work shall be the date of start as specified in Special Conditions of Contract or the first date of handing over of the site, whichever is later, in accordance with the phasing if any, as indicated in the tender document.
Scope and Performance	3.	Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
	4.	Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
	5.	The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications, (Not Applicable) and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.
Works to be carried out	6.	The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities/ Building Components shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.
Sufficiency of Tender	7.	The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the (Not Applicable) Cost quoted in the Schedule of Quantities/ Building Components, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.
Discrepancies and Adjustment of Errors	8.	The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.

	8.1	In the case of discrepancy between the schedule of Quantities/Building Components, the Specifications and/ or the Drawings, the following order of preference shall be observed:- i. Description of Schedule of Quantities/ Building Components. ii. Particular Specification and Special Condition, if any. iii. Drawings. iv. PWD/CPWD Specifications. v. Indian Standard Specifications of B.I.S.
	8.2	If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.
	8.3	Any error in description, quantity or rate in Schedule of Quantities or any omission therefrom 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 drawings and specifications or from any of his obligations under the contract.
Signing of Contract	9.	The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work, sign the contract consisting of:- i. The notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto. ii. Special Conditions of Contract consisting of: a) Various standard clauses with corrections up to the date stipulated in Special Conditions of Contract along with annexures thereto. b) Safety Code. c) Model Rules for the protection of health, sanitary arrangements for workers employed WAPCOS or its contractors. d) Contractor's Labour Regulations. e) List of Acts and omissions for which fines can be imposed. iii. No payment for the work done will be made unless contract is signed by the contractor.

3.0 CLAUSES OF CONTRACT

CLAUSE 1: PERFORMANCE GUARANTEE

i. The contractor shall submit an irrevocable unconditional **Performance Guarantee of 5% (Five percent) of the tendered amount** in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Special Conditions of Contract from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in Special Conditions of Contract on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of Cash (in case guarantee amount is less than Rs. 10,000/-) or Banker's Cheque of any Nationalized bank/Demand Draft of any Nationalized bank/Pay Order of any Nationalized bank (in case guarantee amount is less than Rs. 1, 00,000/-) or Fixed Deposit Receipts or Guarantee Bonds of any Nationalized bank or the State Bank of India in accordance with the form annexed hereto. In case a fixed deposit receipt of any Bank is furnished by the contractor to the WAPCOS as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the WAPCOS to make good the deficit.

ii. **The Performance Guarantee shall be valid up to completion of project plus DLP period (5 Years)**. In case the time for completion of work gets extended, the contractor shall get the validity of Performance Guarantee extended to cover such extended time for completion of work and DLP period of 5 years. After successful completion of the DLP period, the performance guarantee shall be returned to the contractor.

iii. In the event of the contract being determined or rescinded under provision of any of the Clause/Condition of the agreement, the performance guarantee shall stand forfeited in full.

iv. The Performance Guarantee shall be refunded to the Contractor soon after the completion of works and issuance of the completion certificate.

v. Confirmation of Bank Guarantee submitted to WAPCOS shall be got done from issuing Bank through SFMS, as per details given below:

Indian Overseas Bank
NHB, Gurgaon
Branch Code: 1935
IFSC Code: IOBA0001935
Beneficiary: WAPCOS Limited
This shall also be applicable in respect of extension of BGs already furnished to the WAPCOS Ltd.

CLAUSE 1A: RECOVERY OF SECURITY DEPOSIT

The person/persons whose tender(s) may be accepted (hereinafter called the contractor) shall permit WAPCOS at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 2.5% of the gross amount of each running and final bill till the sum deducted will amount to security deposit of 2.5% of the tendered value of the work. Such deductions will be made and held by WAPCOS by way of Security Deposit unless he/they has/have deposited the amount of Security at the rate mentioned above in cash or in the form of Government Securities or fixed deposit receipts. In case a fixed deposit receipt of any Bank is furnished by the contractor to the WAPCOS as part of the security deposit and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the WAPCOS to make good the deficit.

All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising therefrom, or from any sums which may be due to or may become due to the contractor by WAPCOS on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the State Bank of India or by Nationalized banks endorsed in favor of WAPCOS LIMITED, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof. The security deposit shall be collected from the running bills and the final bill of the contractor at the rates mentioned above.

The security deposit as deducted above can be released against bank guarantee issued by a Nationalized bank, on its accumulations to a minimum of Rs. 5.00 lac subject to the condition that amount of such bank guarantee, except last one, shall not be less than Rs. 5.00 lac. Provided further that the validity of bank guarantee including the one given against the earnest money shall be in conformity with provisions contained in clause 17 which shall be extended from time to time depending upon extension of contract granted under provisions of clause 2 and clause 5.

The Security Deposit shall be released after successful completion of Defect Liability Period

In case of contracts involving maintenance of building and services/ any other work after construction of same building and services/ other work, then 50% of Performance Guarantee shall be retained as Security Deposit. The same shall be returned year wise proportionately.
Note-1: Government papers tendered as security will be taken at 3% (Three percent) below its market price or at its face value, whichever is less. The market price of Government paper would be ascertained by the Divisional Officer at the time of collection of interest and the amount of interest to the extent of deficiency in value of the Government paper will be withheld if necessary.
Note-2: Government Securities will include all forms of Securities mentioned in Rule No. 274 of the G.F. Rules except fidelity bond. This will be subject to the observance of the condition mentioned under the rule against each form of security.
Note-3: Note 1 & 2 above shall be applicable for both clause 1 and 1A

CLAUSE 2: COMPENSATION FOR DELAY
If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the purview of the Contract on account of such breach, pay as agreed

compensation the amount calculated at the rates stipulated below as the authority specified in Special Conditions of Contract (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every completed day/month (as applicable) that the progress remains below that specified in Clause 5 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.	**Compensation for delay of work**	0.10 Percentage of contract value per day and shall be subject to the maximum amount of 10 percentage of the estimated amount put to tender.

Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Estimated amount put to tender.

In case no compensation has been decided by the authority in Schedule 'F' during the progress of work, this shall be no waiver of right to levy compensation by the said authority if the work remains incomplete on final justified extended date of completion. If the Engineer in Charge decides to give further extension of time allowing performance of work beyond the justified extended date, the contractor shall be liable to pay compensation for such extended period. If any variation in amount of contract takes place during such extended period beyond justified extended date and the contractor becomes entitled to additional time under clause 12, the net period for such variation shall be accounted for while deciding the period for levy of compensation. However, during such further extended period beyond the justified extended period, if any delay occurs by events under sub clause 5.2, the contractor shall be liable to pay compensation for such delay.

Provided that compensation during the progress of work before the justified extended date of completion for delay under this clause shall be for non-achievement of sectional completion or part handing over of work on stipulated/justified extended date for such part work or if delay affects any other works/services. This is without prejudice to right of action by the Engineer in Charge under clause 3 for delay in performance and claim of compensation under that clause.

In case action under clause 2 has not been finalized and the work has been determined under clause 3, the right of action under this clause shall remain post determination of contract but levy of compensation shall be for days the progress is behind the schedule on date of determination, as assessed by the

authority in Schedule F, after due consideration of justified extension. The compensation for delay, if not decided before the determination of contract, shall be decided after of determination of contract.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the WAPCOS. In case, the contractor does not achieve a particular milestone mentioned in Special Conditions of Contract, or the re-scheduled milestone(s) in terms of Clause 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. Withholding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

CLAUSE 2A: INCENTIVE FOR EARLY COMPLETION

~~In case, the contractor completes the work ahead of updated stipulated date of completion considering the effect of extra work (to be calculated on pro-rata basis as cost of extra work X stipulated period/tendered cost), a bonus @ 1% (one per cent) of the tendered value per month computed on per day basis, shall be payable to the contractor, subject to a maximum limit of 3% (Three percent) of the tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Provided always that provision of the Clause 2A shall be applicable only when so provided in 'Special Conditions of Contract'.~~

CLAUSE 3: WHEN CONTRACT CAN BE DETERMINED

Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor 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 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-workman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.

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.

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 behalf by the Engineer-in-Charge.

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 behalf by the Engineer-in-Charge.

v. If the contractor shall offer or give or agree to give to any person in WAPCOS 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 act in relation to the obtaining or execution of this or any other contract for WAPCOS.

vi. If the contractor shall enter into a contract with WAPCOS 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.

vii. If the contractor had secured the contract with WAPCOS as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement.

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.

ix. If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.

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.

xi. If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of 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 the prior written approval of the Engineer-in-Charge.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the WAPCOS shall have powers:

a) To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the WAPCOS.

b) 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 out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation 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.

~~**CLAUSE 3A**~~

~~In case, the work cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or one month whichever is higher, either party may close the contract. In case contractor wants to close the contract, he shall give notice to the WAPCOS stating the failure on the part of WAPCOS. In such eventuality, the Performance Guarantee of the contractor shall be refunded within following time limits:~~

~~a)~~	~~Tendered value of work is up to Rs. 45 lac~~	~~15 days~~
~~b)~~	~~If the Tendered value of work is more than Rs.45 lac and up to Rs. 2.5 Crore~~	~~21 days~~
~~c)~~	~~If the Tendered value of work exceeds Rs. 2.5 Crore :~~	~~30 days~~

~~Neither party shall claim any compensation for such eventuality. This clause is not applicable for any breach of the contract by either party~~

CLAUSE 4: CONTRACTOR LIABLE TO PAY COMPENSATION EVEN IF ACTION NOT TAKEN UNDER CLAUSE 3

In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 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, 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, clerk of the works, foreman or other authorized agent to remove such tools, 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.

CLAUSE 5: TIME AND EXTENSION FOR DELAY

The time allowed for execution of the Works as specified in the Special Conditions 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 such time period as mentioned in Special Conditions of Contract or from the date of handing over of the site whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid, WAPCOS shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance guarantee absolutely.

5.1 As soon as possible after the Contract is concluded, the Contractor shall submit a Time and Progress Chart for each mile stone and get it approved by the WAPCOS. 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 of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time imposed in the Contract documents, 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 the work as per mile stones given in Special Conditions of Contract.

(a) Project Management shall be done using M.S. Project software.

PROGRAMME CHART

(i) The Contractor shall prepare an integrated Programme chart in MS Project software for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the Programme within the stipulated period or earlier and submit the same for approval to the Engineer-in- Charge within ten days of award of the contract.

(ii) The Programme chart should include the following:
(a) Descriptive note explaining sequence of the various activities.
(b) Network (PERT / CPM / BAR CHART).
(c) Programme for procurement of materials by the contractor.
Programme of procurement of machinery / equipment's having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor. In addition to above, to achieve the progress of Work as per Programme, the contractor must bring at site adequate shuttering material required for cement concrete and R.C.C. works etc. for three floors within one month from the date of start of work till the completion of RCC work as per requirement of work. The contractor shall submit shuttering schedule adequate to complete structure work within laid down physical milestone.

(iii) 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 or after rescheduling of milestones, the contractor shall produce a revised Programme within 7 (seven) days, showing the modifications to the approved Programme to ensure timely completion of the work. The modified schedule of Programme shall be approved by the Engineer in Charge.

(iv) The submission for approval by the Engineer-in-Charge of such Programme or such particulars shall not relieve the contractor of any of the duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.

(v) The contractor shall submit the progress report using MS Project software with base line Programme referred above for the work done during previous month to the Engineer-in-charge on or before 5thday of each month.

5.2 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, local commotion of workmen, strike or lockout, affecting any of 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) Any other cause which, in the absolute discretion of the Engineer-in-Charge 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 authority as indicated in Special Conditions of Contract 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.

5.3 Request for rescheduling of Mile stones and 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 to the authority as indicated in Special Conditions of Contract. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

5.4 In any such case the authority as indicated in Special Conditions of Contract may give a fair and reasonable extension of time and reschedule the mile stones for completion of work. Such extension or rescheduling of the milestones shall be communicated to the Contractor by the authority as indicated in Special Conditions of Contract in writing, within 3 months or 4 weeks of the date of receipt of such request respectively. Non application by the contractor for extension of time/ rescheduling of the milestones shall not be a bar for giving a fair and reasonable

extension/ rescheduling of the milestones by the authority as indicated in Special Conditions of Contract and this shall be binding on the contractor.

CLAUSE 6: MEASUREMENTS OF WORK DONE

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement, the value in accordance with the contract of work done.

All measurement of all items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all works performed under the contract.

All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer- in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties. If for any reason the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the WAPCOS shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor. 10 % of measurements of total work is verify by GNFSU.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available, then a mutually agreed method shall be followed.

The contractor shall give, not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work, before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the WAPCOS to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive

evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 6A: COMPUTERIZED MEASUREMENT BOOK

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.

All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the format of the WAPCOS so that a complete record is obtained of all the items of works performed under the contract. All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his authorized representative. After the necessary corrections made by the Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in- Charge for the dated signatures by the Engineer-in- Charge and the contractor or their representatives in token of their acceptance.

Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-Charge and/or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks/test checks in his draft computerized measurements, and submit to the WAPCOS a computerized measurement book, duly bound, and with its pages machine numbered. The Engineer-in-Charge and/or his authorized representative would thereafter check this MB, and record the necessary certificates for their checks/test checks.

The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct, and no cutting or over-writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound. The contractor shall submit two spare copies of such computerized MB's for the purpose of reference and records.

The contractor shall also submit to the WAPCOS separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages machine numbered along with two spare copies of the bill. Thereafter, this bill will be processed by the Engineer-In-Charge

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements/levels by the Engineer-in- Charge or his representative. Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The contractor shall give not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and/or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized

representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed. Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the WAPCOS to check the measurements recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE 7: PAYMENT ON INTERMEDIATE CERTIFICATE TO BE REGARD AS ADVANCE

No payment shall be made for work, estimated to cost Rupees Twenty thousand or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over Rs. Twenty thousand, the interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the WAPCOS in triplicate on or before the date of every month fixed for the same by the Engineer-in-Charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment/ adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Special Conditions of Contract, in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in-Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in- Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge. The amount admissible shall be paid by 10thworking day after the day of presentation of the bill by the Contractor to the Engineer-in-Charge together with the account of the material issued by the WAPCOS, or dismantled materials, if any. In the case of works outside the headquarters of the Engineer- in-Charge, the period of ten working days will be extended to fifteen working days.

All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided without prejudice to the right of the WAPCOS to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.

The Engineer-in-Charge in his sole discretion on the basis of a certificate from the Engineer-In-Charge to the effect that the work has been completed up to the level in question make interim advance payments without detailed measurements for work done (other than foundations, items to be covered under finishing items) up to lintel level (including sunshade etc.) and slab level, for each floor working out at 75% of the assessed value. The advance payments so allowed shall be adjusted in the subsequent interim bill by taking detailed measurements thereof.

In case of composite tenders, running payment for the major component shall be made by Engineer-In-Charge of major discipline to the main contractor. Running payment for minor component shall be made by the Engineer-in-Charge of the discipline of minor component directly to the main contractor.

In case main contractor fails to make the payment to the contractor associated by him within 15 days of receipt of each running account payment, then on the written complaint of contractor associated for such minor component, Engineer in charge of minor component shall serve the show cause to the main contractor and if reply of main contractor either not received or found unsatisfactory, he may make the payment directly to the contractor associated for minor component as per the terms and conditions of the agreement drawn between main contractor and associate contractor fixed by him. Such payment made to the associate contractor shall be recovered by Engineer-in-charge of major or minor component from the next RA/ final bill due to main contractor as the case may be.

CLAUSE 8: COMPLETION CERTIFICATE AND COMPLETION PLANS

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

CLAUSE 8A: CONTRACTOR TO KEEP SITE CLEAN

When the annual repairs and maintenance of works are carried out, the splashes and droppings from white washing, color washing, painting etc., on walls, floor, windows, etc. shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done, without waiting for the actual completion of all the other items of work in the contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either WAPCOS or through any other agency. Before taking such action, the Engineer-in-Charge shall give ten days' notice in writing to the contractor.

CLAUSE 8B: COMPLETION PLANS TO BE SUBMITTED BY THE CONTRACTOR

The contractor shall submit completion plan as required vide General Specifications for Electrical works (Part-I internal) 2005 and (Part-ll External) 1994 as applicable within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work which shall be final and binding on the contractor.
The contractor shall submit completion plan for water, sewerage and drainage line within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, the WAPCOS will get it done through other agency at his cost and actual expenses incurred plus 1.0% of the value of the work for the same shall be recovered from the contractor.

CLAUSE 9: PAYMENT OF FINAL BILL

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within the period specified here in under, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge or his authorized Engineer, complete with account of materials issued by the WAPCOS and dismantled materials.

a)	Tendered value of work is up to Rs. 1.0 Crore	2 months
b)	If the Tendered value of work is more than Rs. 1.0 Crore and up to Rs. 10.0 Crore	3 months
c)	If the tendered value of work exceeds Rs. 10.0 Crore	6 months

CLAUSE 9A: PAYMENT OF CONTRACTOR'S BILLS TO BANKS

Payments due to the contractor may, if so desired by him, be made to his bank, registered financial, co-operative or thrift societies or recognized financial institutions instead of direct to him provided that the contractor furnishes to the Engineer-in-Charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank; registered financial, co-operative or thrift societies or recognized financial institutions to receive payments at Bank Charges to be borne by him and (2) his own acceptance of the correctness of the amount made out as being due to him by WAPCOS or his signature on the bill or other claim preferred against WAPCOS before settlement by the Engineer-in-Charge of the account or claim by payment to the bank, registered financial, co-operative or thrift societies or recognized financial institutions. While the receipt given by such banks; registered financial, co-operative or thrift societies or recognized financial institutions shall constitute a full and sufficient discharge for the payment, the contractor shall whenever possible present his bills duly receipted and discharged through his bank, registered financial, co-operative or thrift societies or recognized financial institutions.

Nothing herein contained shall operate to create in favor of the bank; registered financial, co-operative or thrift societies or recognized financial institutions any rights or equities vis-à-vis the WAPCOS.

~~**CLAUSE 10 : MATERIALS SUPPLIED BY WAPCOS**~~

~~Materials which WAPCOS will supply are shown in Special Conditions of Contract (SCC) which also stipulates quantum, place of issue and rate(s) to be charged in respect thereof. The contractor shall be bound to procure them from the Engineer-in-Charge.~~

As soon as the work is awarded, the contractor shall finalise the programme for the completion of work as per clause 5 of this contract and shall give his estimates of materials required on the basis of drawings/or schedule of quantities of the work. The Contractor shall give in writing his requirement to the Engineer in Charge which shall be issued to him keeping in view the progress of work as assessed by the Engineer-in-Charge, in accordance with the agreed phased programme of work indicating monthly requirements of various materials. The contractor shall place his indent in writing for issue of such materials at least 7 days in advance of his requirement.

Such materials shall be supplied for the purpose of the contract only and the value of the materials so supplied at the rates specified in the aforesaid schedule shall be set off or deducted, as and when materials are consumed in items of work (including normal wastage) for which payment is being made to the contractor, from any sum then due or which may therefore become due to the contractor under the contract or otherwise or from the security deposit. At the time of submission of bills, the contractor shall certify that balance of materials supplied is available at site in original good condition.

The contractor shall submit along with every running bill (on account or interim bill) material wise reconciliation statements supported by complete calculations reconciling total issue, total consumption and certified balance (diameter/section-wise in the case of steel) and resulting variations and reasons therefore. Engineer-in-Charge shall (whose decision shall be final and binding on the contractor) be within his rights to follow the procedure of recovery in clause 42 at any stage of the work if reconciliation is not found to be satisfactory.

The contractor shall bear the cost of getting the material issued, loading, transporting to site, unloading, storing under cover as required, cutting assembling and joining the several parts together as necessary. Notwithstanding anything to the contrary contained in any other clause of the contract and (or the CPWA Code) all stores/materials so supplied to the contractor or procured with the assistance of the WAPCOS shall remain the absolute property of WAPCOS and the contractor shall be the trustee of the stores/materials, and the said stores/materials shall not be removed/disposed off from the site of the work on any account and shall be at all times open to inspection by the Engineer-in-Charge or his authorized agent. Any such stores/materials remaining unused shall be returned to the Engineer-in-Charge in as good a condition in which they were originally supplied at a place directed by him, at a place of issue or any other place specified by him as he shall require, but in case it is decided not to take back the stores/materials the contractor shall have no claim for compensation on any account of such stores/materials so supplied to him as aforesaid and not used by him or for any wastage in or damage to in such stores/materials.

On being required to return the stores/materials, the contractor shall hand over the stores/ materials on being paid or credited such price as the Engineer in Charge shall determine, having due regard to the condition of the stores/materials. The price allowed for credit to the contractor, however, shall be at the prevailing market rate not exceeding the amount charged to him, excluding the storage charge, if any. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to account for contravention of the terms of the licenses or permit and/or for criminal breach of trust, be liable to WAPCOS for all advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach. Provided that the contractor shall in no case be entitled to any compensation or damages on account of any delay in supply or non-supply thereof all or any such materials and stores provided further that the contractor shall be bound to execute the entire work if the materials are supplied by the WAPCOS within the original scheduled time for completion of the work plus 50% thereof or schedule time plus 6 months whichever is more if the time of completion of work exceeds 12 months, but if a part of the materials only has been supplied within the aforesaid period, then the contractor shall be bound to do so much of the work as may be possible with the materials and stores supplied in the aforesaid period. For the completion of the rest of the work, the contractor shall be entitled to such

~~extension of time as may be determined by the Engineer-in-Charge whose decision in this regard shall be final and binding on the contractor.~~

~~The contractor shall see that only the required quantities of materials are got issued. Any such material remaining unused and in perfectly good/original condition at the time of completion or determination of the contract shall be returned to the Engineer-in-Charge at the stores from which it was issued or at a place directed by him by a notice in writing. The contractor shall not be entitled for loading, transporting, unloading and stacking of such unused material except for the extra lead, if any involved, beyond the original place of issue.~~

CLAUSE 10A: MATERIALS TO BE PROVIDED BY CONTRACTOR

The contractor shall, at his own expense, provide all materials, required for the works other than those which are stipulated to be supplied by the WAPCOS

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 these 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 Engineer-in-Charge shall within thirty days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval, fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.

The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge 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 in obtaining the right 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 powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the Contractor.

The contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with the testing equipment as specified in Special Conditions of Contract.

Minimum 01 year warranty for Mechanical & Electrical Equipment's and other bought out items, at the discretion of WAPCOS Limited, if supplied directly by the contractor. The standard warranty period offered by the Manufacturer shall be retained, in case the original warranty period is more than one year.

CLAUSE 10B:

~~**(i) SECURED ADVANCE ON NON-PERISHABLE MATERIALS**~~

~~The contractor, on signing an indenture in the form to be specified by the Engineer-in-Charge, shall be entitled to be paid during the progress of the execution of the work up to 90% of the assessed value of any materials which are in the opinion of the Engineer-in-Charge non-perishable, non-fragile and non-combustible and are in accordance with the contract and which have been brought on the site in connection therewith and are adequately stored and/or protected against damage by weather or other causes but which have not at the time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered/ deducted from the next payment made under any of the clause or clauses of this contract.~~

~~Such secured advance shall also 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.~~

(ii) MOBILISATION ADVANCE

Mobilization advance 10% of the tendered value will be given to the contractor in one month of the order to commence the work. Such advance shall be in two or more installments to be determined by the Engineer-in-Charge at his sole discretion. The first installment of such advance shall be released by the Engineer-in-Charge to the contractor on a request made by the contractor to the Engineer- in-Charge in this behalf. The second and subsequent installments shall be released by the Engineer- in- Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge.

Before any installment of advance is released, the contractor shall execute a Bank Guarantee Bonds not more than 6 in number from Scheduled Bank for the amount equal to 110% of the amount of advance and valid for the period till recovery of advance. This (Bank Guarantee from Scheduled Bank for the amount equal to 110% of the balance amount of advance) shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery.

~~**(iii) PLANT MACHINERY & SHUTTERING MATERIAL ADVANCE**~~

~~An advance for plant, machinery & shuttering material required for the work and brought to site by the Contractor may be given if requested by the contractor in writing within one month of bringing such plant and machinery to site. Such advance shall be given on such plant and machinery which in the opinion of the Engineer-in-charge will add to the expeditious execution of work and improve the quality of work. The amount of advance shall be restricted to 3% percent of the tender value. In the case of new plant and equipment to be purchased for the work, the advance shall be restricted to 90% of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence satisfactory to the Engineer-in-Charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50% of the depreciated value of plant and equipment as may be decided by the Engineer-in-Charge. The contractor shall, if so required by the Engineer-in-Charge, submit the statement of value of such old plant and equipment duly approved by a Registered Valuer recognized by the Central Board of Direct Taxes under the Income- Tax Act, 1961. No such~~

advance shall be paid on any plant and equipment of perishable nature and on any plant and equipment of a value less than Rs. 50,000/- Seventy five per cent of such amount of advance shall be paid after the plant & equipment is brought to site and balance twenty five percent on successfully commissioning the same.

Leasing of equipment shall be considered at par with purchase of equipment and shall be covered by tripartite agreement with the following:

1. Leasing company which gives certificate of agreeing to lease equipment to the contractor.
2. Engineer in Charge, and
3. The contractor.

This advance shall further be subject to the condition that such plant and equipment (a) are considered by the Engineer-in-Charge to be necessary for the works; (b) and are in working order and are maintained in working order; (c) hypothecated to the WAPCOS as specified by the Engineer-in-Charge before the payment of advance is released. The contractor shall not be permitted to remove from the site such hypothecated plant and equipment without the prior written permission of the Engineer-in-Charge. The contractor shall be responsible for maintaining such plant and equipment in good working order during the entire period of hypothecation failing which such advance shall be entirely recovered in lump sum. For this purpose, steel scaffolding and form work shall be treated as plant and equipment.

The contractor shall insure the Plant and Machinery for which mobilization advance is sought and given, for a sum sufficient to provide for their replacement at site. Any amounts not recovered from the insurer will be borne by the contractor.

(iv) INTEREST & RECOVERY

The mobilization advance in (i) above bear simple interest at the rate of 10 per cent per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by the deduction from the contractors bills commencing after first 10% of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time 80% of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

CLAUSE 10C : PAYMENT ON ACCOUNT OF INCREASE IN PRICE / WAGES DUE TO STATUTORY ORDER

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in- Charge's stores in accordance with Clause 10 thereof) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty) beyond the prices/wages prevailing at the time of the last stipulated date of receipt of tenders including extensions, if any, for the work during contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, then the amount of the contract shall accordingly be varied and provided further that any such increase shall be limited to the price/wages prevailing at the time of updated stipulated date of completion considering effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered amount).

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in- Charge's stores in accordance with Clause 10 thereof) and/or wages of labour as prevailing at the time of last stipulated date of receipt of tender including extensions, if any, is decreased as a direct result of the coming into force of any fresh law or statutory rules or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty), WAPCOS shall in respect of materials incorporated in the

works (excluding the materials covered under Clause 10CA and not being material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 hereof) and/or labour engaged on the execution of the work after the date of coming into force of such law statutory rule or order be entitled to deduct from the dues of the contractor, such amount as shall be equivalent to the difference between the prices of the materials and/or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the prices of materials and/or wages of labour on the coming into force of such law, statutory rule or order. This will be applicable for the contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2.

Engineer-in-Charge may call books of account and other relevant documents from the contractor to satisfy himself about reasonability of increase in prices of materials and wages. The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such materials and/or wages of labour, give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply.
For this purpose, the labour component of the work executed during period under consideration shall be the percentage as specified in Special Conditions of Contract, of the value of work done during that period and the increase/decrease in labour shall be considered on the minimum daily wages in rupees of any unskilled adult male mazdoor, fixed under any law, statutory rule or order.

CLAUSE 10CA : PAYMENT DUE TO VARIATION IN PRICES OF MATERIALS AFTER RECEIPT OF TENDER

If after submission of the tender, the price of materials specified in Special Conditions of Contract increases/ decreases beyond the base price(s) as indicated in Special Conditions of Contract for the work, then the amount of the contract shall accordingly be varied and provided further that any such variations shall be effected for stipulated period of Contract including the justified period extended under the provisions of Clause 5 of the Contract without any action under Clause 2.

However for work done/during the justified period extended as above, it will be limited to indices prevailing at the time of updated stipulated date of completion considering the effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered cost).
The increase/decrease in prices of cement, steel reinforcement, structural steel and POL shall be determined by the Price indices Economic Advisor to Government of India, Ministry of Commerce and Industry. For other items provided in the Special Conditions of Contract, this shall be determined by the All India Wholesale Price Indices of materials as published by Economic Advisor to Government of India, Ministry of Commerce and Industry. Base price for cement, steel reinforcement, structural steel and POL shall be as issued by the state / Central Govt. from time to time. In case, price index of a particular material is not issued by Ministry of Commerce and Industry, then the price index of nearestsimilar material as indicated in Special Conditions of Contract shall be followed.

The amount of the contract shall accordingly be varied for all such materials and will be worked out as per the formula given Clause 10CA, Conditions of Contract of CPWD.

CLAUSE 10CC : PAYMENT DUE TO INCREASE/DECREASE IN PRICES/WAGES (EXCLUDING MATERALS COVERED UNDER CLAUSE 10 CA) AFTER RECEIPT OF TENDER FOR WORKS

If the prices of materials (not being materials supplied or services rendered at fixed prices by the WAPCOS in accordance with clause 10 & 34 thereof) and/or wages of labour required for execution of the work increase, the contractor shall be compensated for such increase as per provisions detailed below and the amount of the contract shall accordingly be varied, subject to the condition that such compensation for escalation in prices and wages shall be available only for the work done during the stipulated period of the contract including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2. However, for the work done during the justified period extended as above, the compensation as detailed below will be limited to prices/wages prevailing at the time of

~~updated stipulated date of completion considering the effect of extra work (extra time to be calculated on pro-rata basis only as cost of extra work x stipulated period/tendered cost). No such compensation shall be payable for a work for which the stipulated period of completionis equal to or less than the time as specified in Special Conditions of Contract. Such compensation for escalation in the prices of materials and labour, when due, shall be worked out based on the provisions mentioned in the Clause 10CC of CPWD Conditions of Contract.~~

CLAUSE 10D: DISMANTLED MATERIAL WAPCOS PROPERTY

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc. as WAPCOS's property and such materials shall be disposed off to the best advantage of WAPCOS according to the instructions in writing issued by the Engineer-in-Charge.

CLAUSE 11: WORKS 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 workmanlike 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 signed 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 and instructions as are not included in the standard specifications specified in Special Conditions of Contract or in any Bureau of Indian Standard or any other, published standard or code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.

The contractor shall comply with the provisions of the contract and with the care and diligence execute 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.

At least to 10% of prescribed Tests as per Central Public Works Department Manual/IS Codes of construction materials shall be carried out at GERI, 10% from the outside NABL approved/ recognized Laboratory as may be approved by WAPCOS without any extra expenditure to WAPCOS. Also including at 80% at site of work.

The Contractor shall establish a field test laboratory on the site with latest equipment's for carrying out field tests of construction materials and will maintain proper records of all the test results.

CLAUSE 12: DEVIATIONS / VARIATIONS EXTENT AND PRICING

1. Schedule of Quantity and Excess extra Item:
    - Variation in the quantity of Work in schedule of quantity shall not vitiate the contract. The rates quoted for the individual item shall applied for the quantities of the work increased or decreased by any percentage.
    - Extra item of the work shall not vitiate for contract. The contractor shall be bound to execute the extra item of work as directed by EIC. The rate for the extra item shall be derived from the SOR of R&B, Panchamahal Year 2022-23 for Civil & Electrical work. Quoted premium of tender shall be applicable on SOR rate. If the rate of extra item is not available in SOR it shall be derived on prevailing market rate/ rate analysis and should be approved by competent authority.
    - Except that when the quantity of any item exceed the quantity as in the tender by more than 10% the contractor will be paid for the quantity in excess of 10% @ entered in SOR of

the year during which the excess in quantity is first executed or tender rate whichever is less. (As per R&B GR No. TNC/10/2017/01/C dated 11.07.2017)

The Engineer-in-Charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

12.1 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, be extended, if requested by the contractor, as follows:

(i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus

(ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

12.2(a) Deviations, Extra Items and Pricing

The In the case of extra item(s) (items that are completely new, and are in addition to the items contained in the contract), the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis, for the work and the engineer-in-charge shall within prescribed time limit of the 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 the contractor shall be paid in accordance with the rates so determined.

12.2(b) Deviations, Substituted Items and Pricing.

In the case of substituted items (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall also be determined in the manner as mentioned in the following para.

(a) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

(b) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

12.2(c) Deviations, Deviated Quantities, Pricing

In the case of contract items, substituted items, contract cum substituted items, which exceed the limits laid down in Special Conditions of Contract, 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, the Engineer-in-Charge shall within prescribed time limit 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 the contractor shall be paid in accordance with the rates so determined.**~~

a) ~~Tendered value of work is up to Rs. 45 lac~~ ~~30 days~~
b) ~~If the Tendered value of work is more than Rs. 45 lac and up to Rs. 2.5 Crore~~ ~~45 days~~
c) ~~If the Tendered value of work exceeds Rs. 2.5 Crore :~~ ~~60 days~~

12.3 ~~The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Special Conditions of Contract, and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates~~.

12.4 ~~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.~~

12.5 For the purpose of operation of Special Conditions of Contract, the following works shall be treated as works relating to foundation unless & otherwise defined in the contract:

(i) For Buildings: All works up to 1.2/ 2.0 meters above ground level or up to floor 1 level whichever is lower.
(ii) For abutments, piers and well staining: All works up to 1.2 m above the bed level.
(iii) For retaining walls, wing walls, compound walls, chimneys, overhead reservoirs/ tanks and other elevated structures: All works up to 1.2 meters above the ground level.
(iv) For basement: All works up to 1.2 m above ground level or up to floor 1 level whichever is lower.
(v) For Roads, all items of excavation and filling including treatment of sub base.

12.6 Any operation incidental to or necessarily has to be in contemplation of tenderer while filing. tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.

CLAUSE 13: FORECLOSURE OF CONTRACT DUE TO ABANDONMENT OR REDUCTION IN SCOPE OF WORK

If at any time after acceptance of the tender, Engineer-in-charge shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

The contractor shall be paid at contract rates, full amount for works executed at site and, in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilized on the work to the full extent in view of the foreclosure;

(i) Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.

(ii) WAPCOS shall have the option to take over contractor's materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work). For materials taken over or to be taken over by WAPCOS, cost of such materials as detailed by Engineer-in- Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.

(iii) If any materials supplied by WAPCOS are rendered surplus, the same except normal wastage shall be returned by the contractor to WAPCOS at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting such materials from site to WAPCOS stores, if so required by WAPCOS, shall be paid.

(iv) Reasonable compensation for transfer of T & P from site to contractor's permanent stores or to his other works, whichever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable.

The contractor shall, if required by the Engineer- in-Charge, furnish to him, books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this condition.

The reasonable amount of items on (i), (iv) and (v) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor's materials at site taken over by the WAPCOS as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Engineer-in-Charge shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the WAPCOS from the contractor under the terms of the contract.

A compensation for such eventuality, on account of damages etc. shall be payable @ 0.5% of cost of work remaining incomplete on date of closure i.e. total stipulated cost of the work less the cost of work actually executed under the contract shall be payable.

CLAUSE 14: CARRYING OUT PART WORK AT RISK & COST OF CONTRACTOR

If contractor:

(i) At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; or

(ii) Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; or

Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge. The Engineer- in-Charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to WAPCOS, by a notice in writing to take the part work / part incomplete work of any item(s) out of his hands and shall have powers to:

(a) Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/or

(b) Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.

The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by WAPCOS because of action under this clause shall not exceed 10% of the tendered value of the work.
In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the WAPCOS are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by WAPCOS in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by WAPCOS as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to WAPCOS in law or per as agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails 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, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.

In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

CLAUSE 15: SUSPENSION OF WORK

(i) The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be final and binding on the contractor) 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 so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons:
   (a) on account of any default on the part of the contractor or;
   (b) for proper execution of the works or part thereof for reasons other than the default of the contractor; or
   (c) 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.

(ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:
   (a) the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and;
   (b) If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in- Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his

employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within fifteen days of the expiry of the period of 30 days.

(iii) If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in subpara (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer-in-Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by WAPCOS or where it affects whole of the works, as an abandonment of the works by WAPCOS, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge. In the event of the contractor treating the suspension as an abandonment of the contract by WAPCOS, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.

~~**CLAUSE 15A: COMPENSATION IN CASE DELAY OF SUPPLY OF MATERIAL**~~

~~The contractor shall not be entitled to claim any compensation from WAPCOS for the loss suffered by him on account of delay by WAPCOS in the supply of materials in Special Conditions of Contract where such delay is covered by the difficulties relating to the supply of wagons, force majeure or any reasonable cause beyond the control of the WAPCOS. This clause 15 A will not be applicable for works where no material is stipulated.~~

CLAUSE 16: ACTION IN CASE WORK NOT DONE AS PER SPECIFICATIONS

All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-In-charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Assurance Unit of the WAPCOS or any organization engaged by the WAPCOS for Quality Assurance and of the Chief Technical Examiner's Office, Engineer, Technical/Nodal officer, University officer of GNFSU and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-charge or his authorized subordinates in-charge of the work or to the General Manager in charge of Quality Assurance or his subordinate officers or the officers of the organization engaged by the WAPCOS for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months (six months in the case of work costing Rs.10 Lac and below except road work) 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 charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority specified in Special Conditions of Contract may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE 17: CONTRACTOR LIABLE FOR DAMAGES, DEFECTS DURING DEFECT LIABILITY PERIOD

If the contractor or his working staff shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within Three year (six months in the case of work costing Rs. Ten lacs and below except road work) after handing over of the site to the University Officials or otherwise of its completion shall have been given by the Engineer-in- Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months (six months in the case of work costing Rs. Ten lacs and below except road work) after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later.

Provided that in the case of road work, if in the opinion of the Engineer-in-Charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later.

The defects liability period will be one year from the date of completion of development and construction works. During this period the Contractor will get the defects rectified without any cost to WAPCOS. For the item of water proofing roof treatment the Contractor will give guarantee bond for ten years. Similarly for other items, like electrical/mechanical equipment which have guarantee/warranty period beyond one year, wherever applicable as per manufacturer recommendations, will also be given guarantee bond by the Contractor to WAPCOS.

CLAUSE 18: CONTRACTOR SUPPLY TOOLS & PLANTS ETC.

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), machinery, tools & plants as specified in Special Conditions of Contract. In addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as

to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

CLAUSE 18A: RECOVERY OF COMPENSATION PAID TO WORKMEN

In every case in which by virtue of the provisions sub-section (1) of Section 12, of the Workmen's Compensation Act, 1923, WAPCOS is obliged to pay compensation to a workman employed by the contractor, in execution of the works, WAPCOS will recover from the contractor, the amount of the compensation so paid; and, without prejudice to the rights of the WAPCOS under sub-section (2) of Section 12, of the said Act, WAPCOS shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by WAPCOS to the contractor whether under this contract or otherwise. WAPCOS shall not be bound to contest any claim made against it under sub-section (1) of Section 12, of the said Act, except on the written request of the contractor and upon his giving to WAPCOS full security for all costs for which WAPCOS might become liable in consequence of contesting such claim.

CLAUSE 18B: ENSURING PAYMENT AND AMENITIES TO WORKERS, IF CONTRACTOR FAILS

In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, WAPCOS is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19H or under the C.P.W.D. Contractor's Labour Regulations, or under the Rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by C.P.W.D. Contractors, WAPCOS will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the WAPCOS under sub-section(2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, WAPCOS shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by WAPCOS to the contractor whether under this contract or otherwise WAPCOS shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the WAPCOS full security for all costs for which WAPCOS might become liable in contesting such claim.

CLAUSE 19: LABOUR LAWS TO BE COMPLIED BY CONTRACTOR

The contractor shall obtain a valid license under the Contract Labour (R&A) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

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

CLAUSE 19A

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

CLAUSE 19B: PAYMENT OF WAGES

5.1 The contractor shall pay to labour employed by him either directly or through subcontractors, wages not less than fair wages as defined in the C.P.W.D. Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

5.2 The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

5.3 In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Contractor's Labour Regulations made by WAPCOS from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions authorized made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

5.4 (a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfilment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.

(b) Under the provision of Minimum Wages (Central) Rules, 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-Charge concerned.

In the case of Union Territory of Delhi, however, as the all-inclusive minimum daily wages fixed under Notification of the Delhi Administration No.F.12(162)MWO/DAB/ 43884-91, dated 31-12-1979 as amended from time to time are inclusive of wages for the weekly day of rest, the question of extra payment for weekly holiday would not arise.

5.5 The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contractor's Labour (Regulation and Abolition) Act 1970, or the modifications thereof or any other laws relating thereto and the rules made thereunder from time to time.

5.6 The contractor shall indemnify and keep indemnified WAPCOS against payments to be made under and for the observance of the laws aforesaid and the C.P.W.D. Contractor's Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors.

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

5.8 Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise.

5.9 The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

CLAUSE 19C

In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at his own expense arrange for the safety provisions as per C.P.W.D. Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to pay a penalty of Rs.200/- for each default and in addition, the Engineer-in-Charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

CLAUSE 19D

The contractor shall submit by the 4thand 19thof every month, to the Engineer-in-Charge, a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively:-

(2) The number of labourers employed by him on the work,
(3) Their working yours,
(4) The wages paid to them,
(5) The accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them, and
(6) The number of female workers who have been allowed maternity benefit according to Clause 19F and the amount paid to them.

Failing which the contractor shall be liable to pay to WAPCOS, a sum not exceeding Rs.200/- for each default or materially incorrect statement. The decision of the Engineer-In-Charge shall be final in deducting from any bill due to the contractor; the amount levied as fine and be binding on the contractor.

CLAUSE 19 E

In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by the WAPCOS and its contractors.

~~**CLAUSE 19 F**~~

~~Leave and pay during leave shall be regulated as follows:-~~

~~**1. Leave :**~~

~~(i) In the case of delivery - maternity leave not exceeding 8 weeks, 4 weeks up to and including the day of delivery and 4 weeks following that day,~~

~~(ii) In the case of miscarriage - upto 3 weeks from the date of miscarriage.~~

~~(iii)~~

~~**2. Pay :**~~

~~(i) in the case of delivery - leave pay during maternity leave will be at the rate of the women's average daily earnings, calculated on total wages earned on the days when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater.~~

~~(ii) in the case of miscarriage - leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of three months immediately preceding the date of such miscarriage.~~

~~3. Conditions for the grant of Maternity Leave:~~

~~No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than six months immediately preceding the date on which she proceeds on leave.~~

~~4. The contractor shall maintain a register of Maternity (Benefit) in the Prescribed Form as shown in appendix -I and II, and the same shall be kept at the place of work.~~

CLAUSE 19 G

In the event of the contractor(s) committing a default or breach of any of the provisions of the WAPCOS, Contractor's Labour Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filing any statement under the provisions of the above Regulations and' Rules which is materially incorrect, he/they shall, without prejudice to any other liability, pay to the Government a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of 5 per cent of the estimated cost of the work put to tender. The decision of the Engineer-in-Charge shall be final and binding on the parties. Should it appear to the Engineer-in-Charge that the contractor(s) is/are not properly observing and complying with the provisions of the C.P.W.D. Contractor's Labour Regulations and Model Rules and the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (R&A) Central Rules 1971, for the protection of health and sanitary arrangements for work-people employed by the contractor(s) (hereinafter referred as "the said Rules") the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities hereinbefore mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/their own expense and to approved standards all necessary huts and sanitary arrangements required for his/their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be remodelled and/or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

CLAUSE 19H

The contractor(s) shall at his/their own cost provide his/their labour with a sufficient number of huts (hereinafter referred to as the camp) of the following specifications on a suitable plot of land to be approved by the Engineer-in-Charge.

(i) (a) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobri on both sides. The floor may be kutcha but plastered with mud gobri and shall be at least 15 cm (6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-Charge and the contractor shall ensure that throughout the period of their occupation, the roofs remain water-tight.

(b) The contractor(s) shall provide each hut with proper ventilation.

(c) All doors, windows, and ventilators shall be provided with suitable leaves for security purposes.

(d) There shall be kept an open space of at least 7.2m (8 yards) between the rows of huts which may be reduced to 6m (20 ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back to back construction will be allowed

(ii) **Water Supply** - The contractor(s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which may be of metal or masonry, shall be provided. The contractor(s) shall also at his/ their own cost make arrangements for laying pipe lines for water supply to his/ their labour camp from the existing mains wherever available, and shall pay all fees and charges therefore.

(iii) The site selected for the camp shall be high ground, removed from jungle.

(iv) **Disposal of Excreta** - The contractor(s) shall make necessary arrangements for the disposal of excreta from the latrines by trenching or incineration which shall be according to the requirements laid down by the Local Health Authorities. If trenching or incineration is not allowed, the contractor(s) shall make arrangements for the removal of the excreta through the Municipal Committee/authority and inform it about the number of labourers employed so that arrangements may be made by such Committee/authority for the removal of the excreta. All charges on this account shall be borne by the contractor and paid direct by him to the Municipality/authority. The contractor shall provide one sweeper for every eight seats in case of dry system.

(v) **Drainage** - The contractor(s) shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy.

(vi) The contractor(s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.

(vii) **Sanitation -** The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.

CLAUSE 19I

The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors' employ upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements. In respect of maintenance/repair or renovation works etc. where the labour have an easy access to the individual houses, the contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour. AE/JE will display a list of contractors working in the colony/Blocks on the notice board in the colony and also at the service centre, to apprise the residents about the same.

CLAUSE 19J

It shall be the responsibility of the contractor to see that the building under construction is not occupied by anybody unauthorizedly during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, a levy upto 3% of tendered value of work may be imposed by the WAPCOS whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, WAPCOS, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

CLAUSE 19K: Employment of Skilled / Semi Skilled Workers

The contractor shall, at all stages of work, deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from Industrial Training Institute/National Institute of construction

Management and Research (NICMAR)/ National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, it's scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer in charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs. 100 per such tradesman per day. Decision of Engineer in Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding.

~~**Clause 19L: Contribution of EPF and ESI**~~

~~The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. These contributions on the part of the employer paid by the contractor shall be reimbursed by the Engineer-in-charge to the contractor on actual basis. The verification of deployment of labour will be done through biometric attendance system or any other suitable method by the Engineer in Charge. The applicable and eligible amount of EPF & ESI shall be reimbursed preferably within 7 days but not later than 30 days of submission of documentary proof of payment provided same are in order.~~

CLAUSE 20: MINIMUM WAGES ACT TO BE COMPLIED WITH

The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970, amended from time to time and rules framed thereunder and other labour laws affecting contract labour that may be brought into force from time to time.

CLAUSE 21: WORK NOT TO BE SUBLET. ACTION IN CASE OF INSOLVENCY

The contract shall not be assigned or sublet without the written approval of the Engineer-in Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of WAPCOS in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the WAPCOS shall have power to adopt the course specified in Clause 3 hereof in the interest of WAPCOS and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

CLAUSE 22

All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of WAPCOS without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

CLAUSE 23 : CHANGES IN FIRM'S CONSTITUTION TO BE INTIMATED

Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is a Proprietor Firm, such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.

CLAUSE 24

All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

CLAUSE 25: SETTLEMENT OF DISPUTES & ARBITRATION

Amicable Resolution and Mediation

Save where expressly stated to the contrary in the Contract, any dispute, difference or controversy of whatever nature between the Parties, howsoever arising under, out of or in relation to the Contract including disputes, if any, with regard to any acts, decision or opinion of WAPCOS Limited Representative and so notified in writing by either Party to the other (the "Dispute") shall in the first instance be attempted to be resolved amicably in accordance with the procedure set out in Clause 25.1 [Amicable Resolution and Mediation] below.

Clause 25.1:

Either Party may require such Dispute to be referred to a person nominated by each Party, for amicable settlement. Upon such reference, the two shall meet at the earliest mutual convenience and in any event within [15 (fifteen)] days of such reference to discuss and attempt to amicably resolve the Dispute.

In the event that the Dispute in question is not resolved amicably within 15 (fifteen) days of such meeting between the Parties in accordance with Clause 25.1 [Amicable Resolution and Mediation] either Party may refer the Dispute to arbitration in accordance with Clause 25.2 [Arbitration Procedure].

Clause 25.2: Arbitration Procedure

Save where expressly stated to the contrary in the Contract, any Dispute shall be finally settled by binding arbitration under the Arbitration and Conciliation Act 1996 by sole arbitrators appointed by CMD, WAPCOS.

Place of Arbitration

The place of arbitration shall be New Delhi/ Gandhinagar (Gujarat)

English Language

The request for arbitration, the answer to the request, the terms of reference, any written submissions, any orders and awards shall be in English and, if oral hearings take place, English shall be the language to be used in the hearings.

Enforcement of Award

The Parties agree that the decision or award resulting from arbitration shall be final and binding upon the Parties and shall be enforceable in accordance with the provisions of the Arbitration and Conciliation Act.

Performance during Arbitration

Pending the submission of and/or decision on a Dispute and until the arbitral award is published, the Parties shall continue to perform their respective obligations under the Contract without prejudice to a final adjustment in accordance with such award.

CLAUSE 26: CONTRACTOR INDEMNIFY WAPCOS AGAINST PATENT RIGHTS

The contractor shall fully indemnify and keep indemnified the WAPCOS against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against WAPCOS in respect of any such

matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the WAPCOS if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

~~**CLAUSE 27: LUMPSUM PROVISIONS IN TENDER**~~

~~When the estimate on which a tender is made includes lump sum in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-Charge payable of measurement, the Engineer-in-Charge may at his discretion pay the lump-sum amount entered in the estimate, and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of the clause.~~

CLAUSE 28: ACTION WHERE NO SPECIFICATIONS ARE SPECIFIED

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers' specifications, if not available then as per District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

CLAUSE 29: WITHOLDING AND LIEN IN RESPECT OF SUM DUE FROM CONTRACTOR

a) Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-Charge or the WAPCOS 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, the Engineer-in-Charge or the WAPCOS shall be entitled to withhold the security deposit, 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, the Engineer-in-Charge or the WAPCOS 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 contract with the Engineer-in-Charge of the WAPCOS or any contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim.

   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 WAPCOS will be kept withheld or retained as such by the Engineer-in-Charge or WAPCOS till the claim arising out of or under the contract is determined by the arbitrator(if the contract is governed by the arbitration clause) by the competent court, as the case may be 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 partnership firm or a limited company, the Engineer-in-Charge or the WAPCOS 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 any partner/limited company as the case may be, whether in his individual capacity or otherwise.

b) WAPCOS 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 WAPCOS 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 WAPCOS to the contractor, without any interest thereon whatsoever.

Provided that the Government shall not be entitled to recover any sum overpaid, nor the contractor shall be entitled to payment of any sum paid short where such payment has been agreed upon between the WAPCOS on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by WAPCOS.

CLAUSE 29A: LIEN IN RESPECT OF CLAIMS IN OTHER CONTRACTS

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or the WAPCOS or any other contracting person or persons through Engineer-in-Charge against any claim of the Engineer-in-Charge or WAPCOS or such other person or persons 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 the WAPCOS or with such other person or persons.

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 the WAPCOS will be kept withheld or retained as such by the Engineer-in-Charge or the WAPCOS or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the 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.

~~**CLAUSE 30: EMPLOYMENT OF COAL MINING OR CONTROLLED AREA LABOUR NOT PERMISSIBLE**~~

~~The contractor shall not employ coal mining or controlled area labour falling under any category whatsoever on or in connection with the work or recruit labour from area within a radius of 32 km (20 miles) of the controlled area. Subject as above the contractor shall employ imported labour only i.e., deposit imported labour or labour imported by contractors from area, from which import is permitted.~~
~~Where ceiling price for imported labour has been fixed by State or Regional Labour Committees not more than that ceiling price shall be paid to the labour by the contractor.~~
~~The contractor shall immediately remove any labourer who may be pointed out by the Engineer in-Charge as being a coal mining or controlled area labourer. Failure to do so shall render the contractor liable to pay to WAPCOS a sum calculated at the rate of Rs.10/- per day per labourer. The certificate of the Engineer-in-Charge about the number of coal mining or controlled area labourer and the number of days for which they worked shall be final and binding upon all parties to this contract.~~

~~It is declared and agreed between the parties that the aforesaid stipulation in this clause is one in which the public are interested within the meaning of the exception in Section 74 of Indian Contract Act, 1872.~~
~~**Explanation:-** Controlled Area means the following areas:~~

~~Districts of Dhanbad, Hazaribagh, Jamtara - a Sub-Division under Santhal Pargana Commissionery, Districts of Bankuara, Birbhum, Burdwan, District of Bilaspur.~~
~~Any other area which may be declared a Controlled Area by or with the approval of the Central Government.~~

CLAUSE 31: UNFILTERED WATER SUPPLY

The contractor(s) shall make his/their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

(i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.

(ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in- Charge, unsatisfactory.

CLAUSE 31A: WATER SUPPLY, IF AVAILABLE

Water if available may be supplied to the contractor by the WAPCOS subject to the following conditions:-

(i) The water charges @ 1 % shall be recovered on gross amount of the work done.

(ii) The contractor(s) shall make his/their own arrangement of water connection and laying of pipelines from existing main of source of supply.

(iii) The WAPCOS do not guarantee to maintain uninterrupted supply of water and it will be incumbent on the contractor(s) to make alternative arrangements for water at his/ their own cost in the event of any temporary break down in the water main so that the progress of his/their work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such break down.

~~**CLAUSE 32 : ALTERNATE WATER ARRANGEMENTS**~~

~~(i) Where there is no piped water supply arrangement and the water is taken by the contractor from the wells or hand pump constructed by the Government, no charge shall be recovered from the contractor on that account. The contractor shall, however, draw water at such hours of the day that it does not interfere with the normal use for which the hand pumps and wells are intended. He will also be responsible for all damage and abnormal repairs arising out of his use, the cost of which shall be recoverable from him. The Engineer-in-Charge shall be the final authority to determine the cost recoverable from the contractor on this account and his decision shall be binding on the contractor.~~

~~(ii) The contractor shall be allowed to construct temporary wells in the proposed land for Construction for taking water for construction purposes only after he has got permission of the Engineer-in- Charge in writing. No charges shall be recovered from the contractor on this account, but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to construction and subsequent maintenance of the wells and shall restore the ground to its original condition after the wells are dismantled on completion of the work.~~

~~**CLAUSE 33 : RETURN OF SURPLUS MATERIALS**~~

~~Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of WAPCOS either by issue from WAPCOS stocks or purchase made under orders or permits or licenses issued by WAPCOS, the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose of them without the written permission of the WAPCOS and return, if required by the Engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the amount charged to him excluding the element of storage charges. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to action for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to WAPCOS for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.~~

CLAUSE 34 : HIRE OF PLANT & MACHINERY

(i) The contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter referred to as T&P) required for execution of the work except for the Plant & Machinery listed in Schedule 'C' and stipulated for issue to the contractor. If the contractor requires any item of T&P on hire from the T&P available with the WAPCOS over and above the T&P stipulated for issue, the WAPCOS will, if such item is available, hire it to the contractor at rates to be agreed upon between him and the Engineer-in-Charge. In such a case, all the conditions hereunder for issue of T&P shall also be applicable to such T&P as is agreed to be issued.

(ii) Plant and Machinery when supplied on hire charges shown in Schedule 'C' shall be made over and taken back at the WAPCOS equipment yard/shed shown in Schedule 'C' and the contractor shall bear the cost of carriage from the place of issue to the site of work and back. The contractor shall be responsible to return the plant and machinery with condition in which it was handed over to him, and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation and otherwise during transit including damage to or loss of plant and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Engineer-In-Charge shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.

(iii) The plant and machinery as stipulated above will be issued as and when available and if required by the contractor. The contractor shall arrange his Programme of work according to the availability of the plant and machinery and no claim, whatsoever, will be entertained from him for any delay in supply by the WAPCOS.

(iv) The hire charges shall be recovered at the prescribed rates from and inclusive of the date the plant and machinery made over upto and inclusive of the date of the return in good order even though the same may not have been working for any cause except major breakdown due to no fault of the contractor or faulty use requiring more than three working days continuously (excluding intervening holidays and Sundays) for bringing the plant in order. The contractor shall immediately intimate in writing to the Engineer-in- Charge when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer-in-Charge shall record the date and time of receipt of such intimation in the log sheet of the plant or machinery. Based on this if the breakdown before lunch period or major breakdown will be computed considering half a day's breakdown on the day of complaint. If the breakdown occurs in the post lunch period of major breakdown will be computed starting from the next working day. In case of any dispute under this clause, the decision of the WAPCOS shall be final and binding on the contractor.

(v) The hire charges shown above are for each day of 8 hours (inclusive of the one hour lunch break) or part thereof.

(vi) Hire charges will include service of operating staff as required and also supply of lubricating oil and stores for cleaning purposes. Power fuel of approved type, firewood, kerosene oil etc. for running the plant and machinery and also the full time chowkidar for guarding the plant and machinery against any loss or damage shall be arranged by the contractor who shall be fully responsible for the safeguard and security of plant and machinery. The contractor shall on or before the supply of plant and machinery sign an agreement indemnifying the WAPCOS against any loss or damage caused to the plant and machinery either during transit or at site of work.

(vii) Ordinarily, no plant and machinery shall work for more than 8 hours a day inclusive of one hour lunch break. In case of an urgent work however, the Engineer-in-Charge may, at his discretion, allow the plant and machinery to be worked for more than normal period of 8 hours a day. In that case, the hourly hire charges for overtime to be borne by the contractor shall be 50% more than the normal proportionate hourly charges (1/8th of the daily charges) subject to a minimum of half day's normal charges on any particular day. For working out hire charges for over time, a period of half an hour and above will be charged as one hour and a period of less than half an hour will be ignored.

~~(viii) The contractor shall release the plant and machinery every seventh day for periodical servicing and/or wash out which may take about three to four hours or more. Hire charges for full day shall be recovered from the contractor for the day of servicing/ wash out irrespective of the period employed in servicing.~~

~~(ix) The plant and machinery once issued to the contractor shall not be returned by him on account of lack of arrangements of labour and materials, etc. on his part, the same will be returned only when they are required for major repairs or when in the opinion of the Engineer-in-Charge, the work or a portion of work for which the same was issued is completed.~~

~~(x) Log Book for recording the hours of daily work for each of the plant and machinery supplied to the contractor will be maintained by the WAPCOS and will be countersigned by the contractor or his authorized agent daily. In case the contractor contests the correctness of the entries and/or fails to sign the Log Book, the decision of the Engineer-in-Charge shall be final and binding on him. Hire charges will be calculated according to the entries in the Log Book and will be binding on the contractor. Recovery on account of hire charges for road rollers shall be made for the minimum number of days worked out on the assumption that a roller can consolidate per day and maximum quantity of materials or area surfacing as noted against each in the annexed statement (see attached annexure).~~

~~(xi) In the case of concrete mixers, the contractors shall arrange to get the hopper cleaned and the drum washed at the close of the work each day or each occasion.~~

~~(a) In case rollers for consolidation are employed by the contractor himself, log book for such rollers shall be maintained in the same manner as is done in case of WAPCOS's rollers, maximum quantity of any items to be consolidated for each roller day shall also be same as in Annexure to Clause 34(x). For less use of rollers, recovery for the less roller days shall be made at the stipulated issue rate.~~

~~(xii) The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation or otherwise or during transit including damage to or loss of parts, and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Engineer-In-Charge shall be the sole judge to determine the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.~~

~~(xiii) The contractor will be exempted from levy of any hire charges for the number of days he is called upon in writing by the Engineer-in-Charge to suspend execution of the work, provided WAPCOS plant and machinery in question have, in fact, remained idle with the contractor because of the suspension~~

~~(xiv) In the event of the contractor not requiring any item of plant and machinery issued by WAPCOS though not stipulated for issue in Schedule 'C' any time after taking delivery at the place of issue, he may return it after two days written notice or at any time without notice if he agrees to pay hire charges for two additional days without, in any way, affecting the right of the Engineer-in-Charge to use the said plant and machinery during the said period of two days as he likes including hiring out to a third party.~~

CLAUSE 35: CONDITION RELATING TO USE OF ASPHALTIC MATERIALS

(i) The contractor undertakes to make arrangement for the supervision of the work by the firm supplying the tar or bitumen used.

(ii) The contractor shall collect the total quantity of tar or bitumen required for the work as per standard formula, before the process of painting is started and shall hypothecate it to the Engineer-in-Charge. If any bitumen or tar remains unused on completion of the work on account of lesser use of materials in actual execution for reasons other than authorized changes of specifications and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-Charge shall be made and the material return to the contractors. Although the materials are hypothecated to WAPCOS, the contractor

undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of work without the consent of the Engineer-in-Charge in writing.

(iii) The contractor shall be responsible for rectifying defects noticed within a year from the date of completion of the work and the portion of the security deposit relating to asphaltic work shall be refunded after the expiry of this period.

CLAUSE 36: EMPLOYMENT OF TECHNICAL STAFF AND EMPLOYEES

Contractors Superintendence, Supervision, Technical Staff & Employees

(i) The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilling of the obligations under the contract. The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(s) and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical representative(s) who will be supervising the work. Minimum requirement of such technical representative(s) and their qualifications and experience shall not be lower than specified in Special Conditions of Contract. The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative(s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative(s) according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative and other technical representative(s) shall be appointed by the contractor soon after receipt of the approval from Engineer-in-charge and shall be available at site before start of work.

All the provisions applicable to the principal technical representative under the Clause will also be applicable to other technical representative(s) The principal technical representative and other technical representative(s) shall be present at the site of work for supervision at all times when any construction activity is in progress and also present himself/themselves, as required, to the Engineer-in-Charge and/or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available at site fully during all stages of execution of work, during recording/checking/test checking of measurements of works and whenever so required by the Engineer-in-Charge and shall also note down instructions conveyed by the Engineer-in- Charge or his designated representative(s) in the site order book and shall affix his/their signature in token of noting down the instructions and in token of acceptance of measurements/ checked measurements/ test checked measurements. The representative(s) shall not look after any other work. Substitutes, duly approved by Engineer-in-Charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two days.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is/are effectively appointed or is/are effectively attending or fulfilling the provision of this clause, a recovery (nonrefundable) shall be effected from the contractor as specified in Special Conditions of Contract and the decision of the Engineer-In-Charge as recorded in the site order book and measurement recorded checked/test checked in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical Principal technical representative and/or other technical representative(s) and if such appointed persons are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their

responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) (in the form of copy of Form-16 or CPF deduction issued to the Engineers employed by him) along with every on account bill final bill and shall produce evidence if at any time so required byte Engineer-in-Charge.

(ii) The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work. The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

(iii)

The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.

CLAUSE 37: LEVY / TAXES PAYABLE BY CONTRACTOR

(i) All the taxes including GST applicable in respect of this contract shall be payable by the Contractor and WAPCOS will not entertain any claim whatsoever in respect of the same.

(ii) The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, stone, kankar, etc. from local authorities.

If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the WAPCOS and does not any time become payable by the contractor to the State Government, Local authorities in respect of any material used by the contractor in the works, then in such a case, it shall be lawful to the WAPCOS and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor

CLAUSE 38 : CONDITIONS FOR REIMBURSEMENT OF LEVY/TAXES IF LEVIED AFTER RECIEPT OF TENDERS

(i) All tendered cost shall be inclusive of all taxes and levies (Including GST) payable under respective statutes. However, if any further tax or levy or cess is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the WAPCOS attributable to delay in execution of work within the control of the contractor.

However, effect of variation in rates of GST or Building and Other Construction Workers Welfare Cess or imposition or repeal of any other tax, levy or cess applicable on output of the works contract shall be adjusted on either side, increase or decrease.

Provided further that for Building and Other Construction Workers Welfare Cess or any tax, levy or cess varied or imposed after the last date of receipt of tender including extension if any, any increase shall be reimbursed to the contractor only if the contractor necessarily and properly pays such increased amount of taxes/levies/cess.

Provided further that such increase Including GST shall be made in the extended period of contract for which the contractor alone is responsible for delay as determined by WAPCOS for extension of time.

(ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the WAPCOS and/or the Engineer-in-Charge and shall also furnish such other information/document as the Engineer-in-Charge may require from time to time.

(iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or cess, give a written notice thereof to the Engineer-in-charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

CLAUSE 39 : TERMINATION OF CONTRACT ON DEATH OF CONTRACTOR

Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the Engineer-In-Charge on behalf of the WAPCOS shall have the option of terminating the contract without compensation to the contractor.

CLAUSE 40 : IF RELATIVE WORKING IN WAPCOS/GNFSU THEN THE CONTRACTOR NOT ALLOWED TO TENDER

The contractor shall not be permitted to tender for works in the WAPCOS responsible for award and execution of contracts in which his near relative is posted in WAPCOS**/GNFSU**. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Officer in the WAPCOS**/GNFSU.** Any breach of this condition by the contractor would render him liable to be debarred from tendering in WAPCOS any breach of this condition.

NOTE: By the term “near relatives” is meant wife, husband, parents and grandparents, children and grandchildren, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.

CLAUSE 41: NO GAZETTED ENGINEER TO WORK AS CONTRACTOR WITHIN ONE YEAR OF RETIREMENT

No engineer of gazette rank or other gazette officer employed in engineering or administrative duties in an engineering department of the Government of India & Gujarat shall work as a contractor or employee of a contractor for a period of one year after his retirement from government service without the previous permission of Government of India & Gujarat in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Government of India as aforesaid, before submission of the tender or engagement in the contractor’s service, as the case may be.

CLAUSE 42: RETURN OF MATERIALS & RECOVERY FOR MATERIAL ISSUED

~~(i) After completion of the work and also at any intermediate stage in the event of non-reconciliation of materials issued, consumed and in balance (see Clause 10), theoretical quantity of materials issued by the WAPCOS for use in the work shall be calculated on the basis and method given hereunder:-~~

~~(a) Quantity of cement & bitumen shall be calculated on the basis of quantity of cement & bitumen required for different items of work as shown in the Schedule of Rates mentioned in Special Conditions of Contract. In case any item is executed for which standard constants for the consumption of cement or bitumen are not available in the above mentioned schedule/statement or cannot be derived from the same shall be calculated on the basis of standard formula to be laid down by the Engineer-in-Charge.~~

~~(b) Theoretical quantity of steel reinforcement or structural steel sections shall be taken as the quantity required as per design or as authorized by Engineer-in-Charge, including authorized lappages, chairs etc. plus 3% wastage due to cutting into pieces, such theoretical quantity being determined and compared with the actual issues each diameter wise, section wise and category wise separately.~~

(c) Theoretical quantity of G.I. & C.I. or other pipes, conduits, wires and cables, pig lead and G.I./M.S. sheets shall be taken as quantity actually required and measured plus 5% for wastage due to cutting into pieces (except in the case of G.I./M.S. sheets it shall be 10%), such determination & comparison being made diameter wise & category wise.

(d) For any other material as per actual requirements.

(ii) Over the theoretical quantities of materials so computed a variation shall be allowed as specified in Special Conditions of Contract. The difference in the net quantities of material actually issued to the contractor and the theoretical quantities including such authorized variation, if not returned by the contractor or if not fully reconciled to the satisfaction of the Engineer-in-Charge within fifteen days of the issue of written notice by the Engineer-in-charge to this effect shall be recovered at the rates specified in Special Conditions of Contract, without prejudice to the provision of the relevant conditions regarding return of materials governing the contract. Decision of Engineer-in-Charge in regard to theoretical quantities of materials, which should have been actually used as per the Annexure of the standard schedule of rates and recovery at rates specified in Special Conditions of Contract, shall be final & binding on the contractor.

For non-scheduled items, the decision of the Engineer-In-Charge regarding theoretical Quantities of materials which should have been actually used, shall be final and binding on the contractor.

(iii) The said action under this clause is without prejudice to the right of the WAPCOS to take action against the contractor under any other conditions of contract for not doing the work according to the prescribed specifications.

CLAUSE 43: COMPENSATION DURING WARLIKE SITUATION

The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation upto the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Engineer-In-Charge upto Rs. 5,000/- and by the WAPCOS for a higher amount. The contractor shall be paid for the damages/destruction suffered and for restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.

Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the A.R.P. Officers or the Engineer-in-Charge (b) for any material etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for the work.

In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Engineer-In-Charge.

CLAUSE 44 : APPRENTICES ACT PROVISIONS TO BE COMPLIED WITH

The contractor shall comply with the provisions of the Apprentices Act, 1961 and the rules and orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the contract and

the WAPCOS may, in his discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

CLAUSE 45 : RELEASE OF SECURITY DEPOSIT AFTER LABOUR CLEARANCE

Release of Security Deposit of the work shall not be refunded till the contractor produces a clearance deposit after labour certificate from the Labour Officer. As soon as the work is virtually complete the contractor shall apply for the clearance certificate to the 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 after 3 months after completion of the work and/or no communication is received from the Labour Officer to this effect till six months after the date of completion, it will be deemed to have received the clearance certificate and the Security Deposit will be released if otherwise due.

CLAUSE46: INSURANCE

1. **Requirements**

   Before commencing execution of works, unless stated otherwise in the special conditions of contract, it shall be obligatory for the contractor to obtain at his own cost stipulated insurance cover under the following requirements:

   a) Contractor's all risk and Third Party Cover.
   b) Liability under the workmen's compensation Act, 1923, Minimum Wages Act, 1948 and Contract Labour (Regulation and Abolition) Act, 1970.
   c) Accidents to staff, Engineers, Supervisors and others who are not governed by workmen's compensation Act.
   d) Damage to material, machinery and works due to fire theft etc.
   e) Any other risk to be covered by insurance as may be specified by the employer in the special conditions of contract.

2. **Policy in Joint Names of Contractor and Employer**

   The policy referred to under sub-clause 46(1) above shall be obtained in the joint names of the contractor and the employer and shall inter-alia provide coverage against the following, arising out of or in connection with execution of works, their maintenance and performance of the contract.

   a) Loss of life or injury involving public, employee of the contractor, or that of employer and Engineer, labour etc.
   b) Injury, loss or damage to the works or property belonging to public, government bodies, local authorities, utility organizations, contractors, employer or others.

3. **Currency of Policy**

   The policies shall remain in force throughout the period of execution of the works and till the expiry of the defect liability period. The contractor shall, whenever called upon, produce to the engineer or his representative the various insurance policies obtained by him as also the rates of premia and the premia paid by him to ensure that the polices indeed continue to be in force. If the contractor fails to effect or keep in force or provide adequate cover in the insurance policies mentioned in the sub clause 46(1) or any other insurance he might be required to effect under the contract, then in such cases, the employer may effect and keep in force any such insurance or further insurance and the cost and expenses incurred by him in this regard shall be deductible from payments due to the contractor or from the contractor's performance security.

CLAUSE 47: CONDITIONS SPECIFIC TO GREEN BUILDINGS PRACTICES CLAUSE

The contractor shall strictly adhere to the following conditions as part of his contractual obligations:

1. SITE

~~**1.1** The contractor shall ensure that adequate measures are taken for the prevention of erosion of the top soil during the construction phase. The contractor shall implement the Erosion and Sedimentation Control Plan (ESCP) provided to him by the Engineer-in-charge as part of the larger Construction Management Plan (CMP). The contractor shall obtain the Erosion and Sedimentation Control Plan (ESCP) Guidelines from the Engineer-in-charge and then prepare "working plan" for the following month's activities as a CAD drawing showing the construction management, staging & ESCP. At no time soil should be allowed to erode away from the site and sediments should be trapped where necessary.~~

~~**1.2** The contractor shall ensure that all the top soil excavated during construction works is neatly stacked and is not mixed with other excavated earth. The contractors shall take the clearance of the architects / Engineer-in-charge before any excavation. Top soil should be stripped to a depth of 20 cm (centimetres) from the areas to be disturbed, for example proposed area for buildings, roads, paved areas, external services and area required for construction activities etc. It shall be stockpiled to a maximum height of 40 cm in designated areas, covered or stabilised with temporary seeding for erosion prevention and shall be reapplied to site during plantation of the proposed vegetation. Top soil shall be separated from subsoil, debris and stones larger than 50 mm (millimetre) diameter. The stored top soil may be used as finished grade for planting areas.~~

~~**1.3** The contractor shall carry out the recommendations of the soil test report for improving the soil under the guidance of the Engineer-in-charge who would also advise on the timing of application of fertilizers and warn about excessive nutrient levels.~~

1.4 The contactor shall carry out post-construction placement of topsoil or other suitable plant material over disturbed lands to provide suitable soil medium for vegetative growth. Prior to spreading the topsoil, the sub-grade shall be loosened to a depth of 50mm to permit bonding. Topsoil shall be spread uniformly at a minimum compacted depth of 50mm on grade 1:3 or steeper slopes, a minimum depth of 100mm on shallower slopes. A depth of 300mm is preferred on relatively flatter land.

1.5 The Contractor should follow the construction plan as proposed by the Engineer-in-charge to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site. Protect top soil from erosion by collection storage and reapplication of top soil, constructing sediment basin, contour trenching, mulching etc.

1.6 No excavated earth shall be removed from the campus unless suggested otherwise by Engineer-in-charge. All subsoil shall be reused in backfilling/landscape, etc. as per the instructions of the Engineer-in-charge

1.7 The contractor shall not change the natural gradient of the ground unless specifically instructed by the architects / landscape consultant. This shall cover all natural features like water bodies, drainage gullies, slopes, mounds, depressions, rocky outcrops, etc. Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by the Engineer-in-charge.

1.8 The contractor shall not carry out any work which results in the blockage of natural drainage.

1.9 The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Engineer-in-charge

1.10 Contractor shall reduce pollution and land development impacts from automobiles use during construction.

1.11 Overloading of trucks is unlawful and creates and erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering must take place. No overloading shall be permitted.

2. CONSTRUCTION PHASE AND WORKER FACILITIES

2.1 The contractor shall specify and limit construction activity in preplanned/ designated areas and shall start construction work after securing the approval for the same from the Engineer-in-charge. This shall include areas of construction, storage of materials, and material and personnel movement.

2.2 Preserve and Protect Landscape during Construction

a) The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.

b) The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.

c) The contractor shall conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity. Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) proposed by the Engineer-in-charge. All the existing trees should be preserved, if not possible than compensate the loss by re-planting trees in the proportion of 1:3.

d) The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.

e) The contractor shall ensure that maintenance activities shall be performed as needed to ensure that the vegetation remains healthy. The preserved vegetated area shall be inspected by the Engineer-in-charge at regular intervals so that they remain undisturbed. The date of inspection, type of maintenance or restorative action followed shall be recorded in the logbook.

2.3 Contractor shall be required to develop and implement a waste management plan, quantifying material diversion goals. He shall establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. A project-vide policy of “Nothing leaves the Site” should be followed. In such a case when strictly followed, care would automatically be taken in ordering and timing of materials such that excess doesn’t become “waste”. The Contractor’s ingenuity is especially called towards meeting this prerequisite/ credit (GRIHA). Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable material, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site.

2.4 Contractor shall collect all construction waste generated on site. Segregate these wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc.

2.5 The contractor shall provide clean drinking water for all workers.

2.6 The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. The total no. to be provided shall not be less than 1 per 30 employs in any one shift. Toilet

facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.

2.7 The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure proper screening, covering stockpiles, covering brick and loads of dusty materials, wheel-washing facility, gravel pit, and water spraying. Contractor shall ensure the following activities to prevent air pollution during construction:

- Clear vegetation only from areas where work will start right away
- Vegetate / mulch areas where vehicles do not ply.
- Apply gravel / landscaping rock to the areas where mulching / paving is impractical
- Identify roads on-site that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10 – 20%.
- Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged. Water spraying can be done on:
  a) Any dusty materials before transferring, loading and unloading
  b) Area where demolition work is being carried out
  c) Any un-paved main haul road
  d) Areas where excavation or earth moving activities are to be carried out
- The contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.
- All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust / particulate emissions.
- Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / cleaned up immediately before they can infiltrate into the soil / ground or runoff in nearby areas
- Provide hoardings of not less than 3m high along the site boundary, next to a road or other public area.
- Provide dust screens, sheeting or netting to scaffold along the perimeter of the building Cover stockpiles of dusty material with impervious sheeting.
- Cover dusty load on vehicles by impervious sheeting before they leave the site.

~~2.8 Contractor shall be required to provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate the size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminum can crushers, recycling chutes, and collection bins at individual workstations to further enhance the recycling program.~~

~~2.9 The contractor shall ensure that no construction leach ate (Ex: cement slurry), is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this~~

~~including, reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to the treatment device or facility (municipal sewer line).~~

2.10 Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.

2.11 The contractor shall comply with the safety procedures, norms and guidelines (as applicable) as outlined in the document Part 7 - Constructional practices and safety, 2005, National Building code of India, Bureau of Indian Standards. A copy of all pertinent regulations and notices concerning accidents, injury and first-aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first-aid shall be available at work site to render and direct first-aid to causalities. A telephone may be provided to first-aid assistant with telephone numbers of the hospitals displayed. Complete reports of all accidents and action taken thereon shall be forwarded to the competent authorities.

2.12 The contractor shall ensure the following activities for construction workers safety, among other measures:

- Guarding all parts of dangerous machinery.
- Precautionary signs for working on machinery
- Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.
- Durable and reusable formwork systems to replace timber formwork andensure that formwork where used is properly maintained.
- Ensuring that walking surfaces or boards at height are of sound constructionand are provided with safety rails or belts.
- Provide protective equipment; helmets etc.
- Provide measures to prevent fires. Fire extinguishers and buckets of sand to be provided in the fire-prone area and elsewhere.
- Provide sufficient and suitable light for working during night time.

2.13 Adopt additional best practices, prescribed norms in construction industry.

2.14 The storage of material shall be as per standard good practices as specified in Part 7, Section 2 – Storage, Stacking and Handling practices, NBC 2005 and shall be to the satisfaction of the Engineer-in-charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. Watch and ward of the Contractor's materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipments with proper access and proper manoeuvrability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipments at different stages of construction shall be considered. The Owner shall not take any responsibility on any account.

~~2.15 The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labelled in both Hindi and English.~~

~~2.16 The contractor shall prepare and submit 'Spill prevention and control plans' before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.~~

2.17 Contractor shall collect the relevant material certificates for materials with high recycled (both post-industrial and post-consumer) content, including materials for structural use like TMT steel rolled with high percentage of recycled steel, and RMC mix with fly-ash etc.(see appendix)

2.18 Contractor shall collect the relevant material certificates for rapidly renewable materials such as bamboo, wool, cotton insulation, agrifiber, linoleum, wheat board, strawboard and cork.

2.19 Contractor shall adopt an IAQ (Indoor Air Quality) management plan to protect the system during construction, control pollutant sources, and interrupt pathways for contamination. He shall sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wallboard. He shall also protect stored on-site or installed absorptive materials from moisture damage.

2.20 The contractor shall ensure that a flush out of all internal spaces is conducted prior to andover. This shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.

2.21 ~~Contractor shall make efforts to reduce the quantity of indoor air contaminants that are porous or potentially irritating harmful to the comfort and well-being of installer and building occupants. Contractor shall ensure that the VOC (Volatile Organic Compounds) content of paints, coatings and primers used must not exceed the VOC content limits mentioned below:~~

~~Paints~~

~~Non-flat - 150 g/L~~

~~Flat (Mat) - 50 g/L~~

~~Anti-corrosive/ anti-rust - 250 g/L~~

~~Coatings~~

~~Clear wood finishes~~

~~Varnish - 350 g/L~~

~~Lacquer - 550 g/L~~

~~Floor coatings - 100 g/L~~

~~Stains - 250 g/L~~

~~Sealers~~

~~Waterproofing sealer - 250 g/L~~

~~Sanding sealer - 275 g/L~~

~~Other sealers - 200 g/L~~

~~The VOC (Volatile Organic Compounds) content of adhesives and sealants used must be less than VOC content limits mentioned:~~

~~Architectural Applications VOC Limit(g/l less water)~~

~~Indoor Carpet adhesives - 50~~

~~Carpet Pad Adhesives - 50~~

~~Wood Flooring Adhesive - 100~~

~~Rubber Floor Adhesives - 60~~

~~Sub Floor Adhesives - 50~~

~~Ceramic Tile Adhesives - 65~~

~~VCT and Asphalt Tile adhesives - 50~~

~~Dry Wall and Panel Adhesives - 50~~

~~Structural Glazing Adhesives - 100~~

~~Multipurpose Construction Adhesives - 70~~

~~Substrate Specific Application VOC Limit (g/l less water)~~

~~Metal to Metal - 30~~

~~Plastic Foams - 50~~

~~Porous material (except wood) - 50~~

~~Wood - 30~~

~~Fiber Glass – 80~~

2.22 Wherever required, Contractor shall meet and carry out documentation of all activities on site, supplementation of information and submittals in accordance with GRIHA program

standards and guidelines. Towards meeting the aforementioned building environmental rating standard(s) expert assistance shall be provided to him up on request.

2.23 **Water Use during Construction**

Contractor should spray curing water on concrete structure and shall not allow free flow of water. After liberal curing on the first day, all the verticals surfaces of concrete structures should be painted with curing chemical to save water nothing extra shall be paid. Concrete structures should be kept covered with thick cloth/gunny bags and water should be sprayed on them. Contractor shall do water ponding on all sunken slabs using cement and sand mortar.

2.24 The Contractor shall remove from site all rubbish and debris generated by the works and keep works clean and tidy throughout the Contract Period. All the serviceable and nonservice able (malba) material shall be segregated and stored separately. The malba obtained during construction shall be collected in well-formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitable covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during day. In case of poor visibility artificial light may be provided.

2.25 **MATERIALS & FIXTURES FOR THE PROJECT**

2.26 The contractor shall endeavor to source most of the materials for construction at this project within a distance of 100 km radius from the project site. Contractor shall collect the relevant material certificates to prove the same

a) Any material that is to be sourced from outside the prescribed radius shall be done after securing the necessary approval from the Engineer-in-charge.

~~b) **All cement used at site for reinforced concrete, precast members, mortar, plaster, building blocks, etc. shall be PPC (Ordinary Portland Cement). The PPC must meet the requirements of IS 1489: 1991. (Minimum 25% replacement of cement with fly ash in PPC (Portland Pozzolona Cement) by weight of the cement used in the overall RC for meeting the equivalent strength requirements).**~~

~~c) As a measure to reduce wastage and water consumption during construction, the contractor shall source or set up the infrastructure for a small scale ready mix concrete, all concreting works at site shall utilize only batch mix concrete.~~

~~d) The contractor has to comply as per MoEF issued notification 8.0.763(E) dated 14th Sept., 1999 containing directive for greater fly ash utilization, where it stipulates that ii. Every construction agency engaged in the construction of buildings within a radius of 50km radius of a Thermal Power Plant, have to use of 100% fly ash based bricks/blocks in their construction. Any brick/block containing more than 25% fly ash is designated as fly ash brick/block. As per GRIHA credits, bricks / blocks should contain more than 40% fly ash.~~

e) The contractor shall ensure that sand from approved source is used in place of sand in an all concreting works unless specifically instructed otherwise by the Engineer-in-charge.

f) Timber and aluminum use should be minimized in the project. If used, timber shall constitute of reclaimed timber and aluminum shall constitute recycled content. The source of such reclaimed timber shall be approved by the Engineer-in-charge.

g) The contractor shall ensure that non-toxic anti-termite and other pest control is strictly used.

h) The contractor shall ensure that all paints, polishes, adhesives and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Engineer-in-charge before the application of any such material.

i) All plumbing and sanitary fixtures installed shall be as per the requirement of the GRIHA and shall adhere to the minimum LPM and LPF mentioned.

j) The contractor shall employ 100% zero ODP (Ozone Depletion Potential) insulation; HCFC hydro-chlorofluorocarbon)/ and CFC (chlorofluorocarbon) free HVAC and refrigeration equipment's and/halon-free fire suppression and fire extinguishing systems.

k) The contractor shall ensure that all composite wood products/agro-fiber products used for cabinet work, etc. do not contain any added urea formaldehyde resin.

2.28 **CONSTRUCTION WASTE**

a) Contractor shall ensure that wastage of construction material is kept to a maximum of 3%.

b) All construction debris generated during construction shall be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type. Employ measures to segregate the waste on site into inert, chemical, or hazardous wastes.

c) All construction debris shall be used for road preparation, back filling etc. as per the instructions of the Engineer-in-charge, with necessary activities of sorting, crushing, etc.

d) No construction debris shall be taken away from the site, without the prior approval of the Engineer-in-charge.

e) The contractor shall recycle the unused chemical/hazardous wastes such as oil, paint, batteries, and asbestos.

f) If and when construction debris is taken out of the site, after prior permissions from the Engineer-In-Charge / Project Manager, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

g) Inert waste to be disposed off by Municipal Corporation/ local bodies at landfill sites.

2.29 **Documentation**

a) ~~The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer-in-charge on a monthly basis:~~

~~i) Water consumption in liters~~

~~ii) Electricity consumption in 'kwh' units~~

~~iii) Diesel consumption in liters~~

~~iv) Quantum of waste generated at site and the segregated waste types divided into inert, chemical and hazardous wastes.~~

~~v) Digital photo documentation to demonstrate compliance of safety guidelines as specified here.~~

b) The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer-in-charge on a weekly basis:

i) Quantities of material brought into the site, including the material issued to the contractor by the WAPCOS.

ii) Quantities of construction debris (if at all) taken out of the site.

iii) Digital photographs of the works at site, the workers facilities, the waste and other material storage yards, pre-fabrication and block making works, etc. As guided by the Engineer-in-charge.

iv) Fill all the register up-to-date for Daily progress, Cement consumption, steel consumption, level register, drawing register etc as per direction of Engineer-in-charge.

c) The contractor shall submit one document after construction of the buildings, a brief description along with photographic records to show that other areas have not been disrupted during construction. The document should also include brief explanation and photographic records to show erosion and sedimentation control measures adopted. (Document CAD drawing showing site plan details of existing vegetation, existing buildings, existing slopes and site drainage pattern, staging and spill prevention measures, erosion and sedimentation control measures and measures adopted for top soil preservation during construction

~~d) The contractor shall submit to the Engineer-in-charge after construction of the buildings, a detailed as built quantification of the following:~~

~~i) Total materials used,~~

~~ii) Total top soil stacked and total reused~~

~~iii) Total earth excavated,~~

~~iv) Total waste generated,~~
~~v) Total waste reused,~~
~~vi) Total water used,~~
~~vii) Total electricity, and~~
~~viii) Total diesel consumed.~~

e) The contractor shall submit to the Engineer-in-charge, before the start of construction, a site plan along with a narrative to demarcate areas on site from which top soil has to be gathered, designate area where it will be stored, measures adopted for top soil preservation and indicate areas where it will be reapplied after construction is complete.

~~f) The contractor shall submit to the Engineer-in-charge, a detailed narrative (not more than 250 words) on provision for safe drinking water and sanitation facility for construction workers and site personnel.~~

~~g) Provide supporting document from the manufacturer of the cement specifying the fly-ash content in PPC used in reinforced concrete.~~

h) Provide supporting document from the manufacturer of the pre-cast building blocks specifying the fly ash content of the blocks used in an infill wall system.

i) The contractor shall, at the end of construction of the buildings, submit to the Engineer-in-charge, submit following information, for all material brought to site for construction purposes, including manufacturer's certifications, verifying information, and test data, where Specifications sections require data relating to environmental issues including but not limited to:
   i) Source of products: Supplier details and location of the supplier and brand name.
   ii) Project Recyclability: Submit information to assist Owner and Contractor in recycling materials involved in shipping, handling, and delivery, and for temporary materials necessary for installation of products.
   iii) Recycled Content: Submit information regarding product postindustrial recycled and postconsumer recycled content. Use the "Recycled Content Certification Form", to be provided by the Commissioning Authority appointed for the Project.
   iv) Product Recyclability: Submit information regarding product and product's component's recyclability including potential sources accepting recyclable materials.
   v) Clean tech: Provide pollution clearance certificates from all manufacturers of materials.
   vi) Indoor Air quality and Environmental Issues: Submit following certificates:
      a) Certifications from manufacturers of Low VOC paints, adhesives, sealant and polishes used at this particular project site.
      b) Certification from manufacturers of composite wood products/agro fiber products on the absence of added urea formaldehyde resin in the products supplied to them to this particular site.
      c) Submit environmental and pollution clearance certificates for all diesel generators installed as part of this project.

~~j) Provide total support to the Engineer-in-charge appointed by the owner in completing all Green Building Rating related formalities, including signing of forms, providing signed letters in the contractor's letterhead.~~

2.30 **EQUIPMENT**

a) To ensure energy efficiency during and post construction all pumps, motors and engines used during construction or installed, shall be subject to approval and as per the specifications of the architects.

b) All lighting installed by the contractor around the site and at the labour quarters during construction shall be CFL/LED bulbs of the appropriate illumination levels. This condition is a must, unless specifically prescribed.

The contractor is expected to go through all other conditions of the GRIHA rating stipulations, which can be provided to him by the architects.
Failure to adhere to any of the above mentioned items, without necessary clearances from the architects and the Engineer-in-charge, shall be deemed as a violation of contract and the contractor shall be held liable for penalty as determined by the architects.

CLAUSE 48: PAYMENT TERMS

1. Payment Schedule

The Payment Schedule includes a schedule setting out each Milestone Event to be achieved in a month for the Works. **RTGS CHARGES FOR BILL PAYMENTS SHALL BE BORN BY BIDDERS.**

2. Contractor's Application for Payment

From the date of issue of the Notice to Proceed, on the 5th(fifth) Business Day of any month, the Contractor may submit a Request for Payment, to WAPCOS Limited Representative in respect of the preceding month.

Within each Request for Payment the Contractor shall show separately:

(i) the amounts which the Contractor claims to be payable as the cost of the Works completed during that month; and
(ii) the cumulative amount of all prior payments made by WAPCOS Limited; and
(iii) any amounts to which the Contractor considers are due and payable to it in accordance with the provisions of the Contract.

The Contractor's Request for Payment shall:

(i) be prepared on forms in the form and in a number advised by WAPCOS Limited Representative; and
(ii) contain confirmation of the relevant Milestone Events which, in the opinion of the Contractor have been achieved in that month which applies to each such Milestone Event; and
(iii) be accompanied by:
  (a) Copy of relevant records of measurement of works, jointly taken and signed by both the parties;
  (b) A status report describing in such detail as may reasonably request, the percentage of any uncompleted Milestone Event for the month in question and the work to be undertaken by the Contractor prior to the next Request for Payment;
  (c) Certification by WAPCOS Limited Representative confirming that the Milestone Events referred to in the Request for Payment have been achieved.
  (d) Confirmation by the Contractor of any amounts due and owing from the Contractor to WAPCOS Limited pursuant to the Contract;
  (e) The Contractor's certification that the quality of all completed Works accords with the requirements of the Contract;
  (f) The Contractor's certification that each obligation, item of cost or expense mentioned in that Request for Payment has not been the basis of any previous payment.
  (g) The Contractor's certification that it has reviewed all financial and budget data contained in the Request for Payment;
  (h) The Contractor's certification that the quality of all completed Works accords with the requirements of the Contract;
  (i) The Contractor's certification that each obligation, item of cost or expense mentioned in that Request for Payment has not been the basis of any previous payment; and

(j) The Contractor's certification that each Sub-contractor who performed part of the Works which was included in the immediately preceding Certificates of Payment was paid all amounts then due to it for such Works
(k) The Contractor providing evidence of the validity of the Contractor's Insurances.

3. Certificates of Payment

Within [14 (fourteen)] Business Days of receipt of the Contractor's Request for Payment under Clause 48(2) [Contractor's Application for Payment], WAPCOS Limited and WAPCOS Limited Representative shall review such request and, shall issue to the Contractor, a Certificate of Payment certifying what amounts WAPCOS Limited shall pay. Each Certificate of Payment shall be for an amount which in the opinion of WAPCOS Limited, is the basis of the Request for Payment and pursuant to the Contract, is properly due to the Contractor (the "Gross Certifiable Amount") less (i) the cumulative amounts of payments previously certified as due to the Contractor, (ii) any deduction on account of recovery of Advance Payment, and (iii) Retention Amount.

In the event that the Contractor fails to achieve any Milestone Event specified in the Payment Schedule, the Contractor shall not be entitled to the payment value attributable to that Milestone Event until the relevant Milestone Event has been achieved. When the relevant Milestone Event is achieved, the Contractor may include the payment value attributable to the Milestone Event in the next Request for Payment.

No sum shall be included in the Certificate of Payment in respect of Materials yet to be incorporated into the Permanent Works unless the WAPCOS Limited Representative is satisfied that:

(i) such Materials have been properly acquired and properly and not prematurely delivered to the Project Site;
(ii) such Materials have been properly stored on the Project Site and fully protected against loss, damage or deterioration;
(iii) the Contractor's records of the requisitions, orders, receipts and use of any Materials are kept in a form approved by the WAPCOS Limited Representative, and such records are available for inspection by the WAPCOS Limited Representative; and
(iv) The Contractor has submitted a proper statement of the cost of acquiring the Materials together with such documents as may be required for evidencing such cost.

Without prejudice to any other rights of WAPCOS Limited to withhold payment to the Contractor, WAPCOS Limited may withhold from any payment due to the Contractor such amount as WAPCOS Limited deems reasonably necessary or appropriate:

(i) if in the opinion of the WAPCOS Limited Representative the progress of the Works at the time of the Request for Payment is behind the progress of the Works as set out in the Programme; and/or
(ii) to protect it from any losses, expenses, costs or liability because of any one or more of the following reasons:
    (a) defects and deficiencies in any Works, whether or not payment has been made;
    (b) unsatisfactory performance of the Contract;
    (c) the filing of third party claims relating to the Works or any of its commitment parts for which the Contractor is liable;
    (d) the Contractor's failure to make payments to Subcontractors;
    (e) failure by the Contractor to provide or procure replacement Performance Security in accordance with the Contract;
    (f) failure by the Contract to provide evidence of insurance coverage in accordance with the Contract;

(g) reasonable evidence that Completion will not occur by the Time for Completion;
(h) any overpayments made by WAPCOS Limited with respect to a previous payment;
(i) failure by the Contractor to submit a properly updated monthly Programme; and
(j) failure by the Contractor to provide satisfactory evidence that the costs of all labour and Materials and other obligations arising out of the Contract have been fully satisfied and discharged by the Contractor and/or to otherwise fail to submit adequate supporting documentation for any Request for Payment.

Any Provisional Sum Works shall only be executed in whole or part upon the WAPCOS Limited Representative's instruction. If the WAPCOS Limited Representative issues no such instruction, the Provisional Sum Works shall not form part of the Works and the Contractor shall not be entitled to payment for it. The Contractor shall be deemed to have allowed the necessary time and resources to enable design and Execution of the Provisional Sum Works in so far as the scope and nature of the Provisional Sum Works was reasonably foreseeable.

The Contractor shall be entitled only to such amount in respect of the Provisional Sum Works as the WAPCOS Limited Representative determines in accordance with this Clause 48(3). The WAPCOS Limited Representative shall notify the Contractor of any such determination. The WAPCOS Limited Representative shall have the authority to issue instructions to the Contractor for every Provisional Sum Works for which the Contractor shall be entitled to a part of the Provisional Sum as determined by the WAPCOS Limited Representative.

The Contractor shall produce to the WAPCOS Limited Representative all quotations, vouchers, invoices, accounts or receipts in connection with the expenditure in respect of the Provisional Sum Works, except where the Provisional Sum Works is valued in accordance with the item wise rates quoted by the Contractor in its bid submitted to the Employer.

In respect of every Provisional Sum the WAPCOS Limited Representative shall have authority to issue instructions for the execution of work or for the supply of goods, materials, Plant Sums or services by the Contractor, in which case the Contractor shall be entitled to an amount equal to the value thereof determined in accordance with Clause 48(3).

4. Payment

WAPCOS Limited shall pay the amount certified in a Certificate of Payment less the amount paid earlier in accordance with Clause 48(3) [Certificate of Payment], no later than [15 (fifteen)] Business Days from the date of such Certificate of Payment.

The Associate/ Sub – Consultant/ Sub-Contractor acknowledges that under the present Contract/Agreement/Work Order/Arrangement, WAPCOS is only working as intermediary between Gujarat Natural Farming Science University, Jambudi Village, Taluka halol, Panchmahal District being Principal Employer/Client and Associate/Sub-consultant/Sub-Contractor. Thus the Associate/Sub-consultant/Sub-Contractor unconditionally acknowledges that the payments under the present contract/Agreement/Work Order/Arrangement shall be made proportionately by WAPCOS only on back to back basis i.e. after 21 days subject to receipt of payment from WAPCOS HQ . The Associate/Sub-consultant/Sub-Contractor also unconditionally agree that in the event the payment or part thereof, under the present Contract/Agreement/Work Order/Arrangement is not received from Gujarat Natural Farming Science University, Jambudi Village, Taluka halol, Panchmahal District (Principal Employer/Client), then WAPCOS &/or any of its Employee/Officer shall not be responsible to pay any amount to Associate/Sub-consultant/Sub-Contractor. The said condition shall supersede any and all other conditions of Contract/Agreement/Work Order/Arrangement between the parties. The Running bill and Final bill is also verified by WAPCOS/GNFSU. All the tax applicable in respect of this contract shall be

payable by the Contractor and WAPCOS will not entertain any claim whatsoever in respect of the same. All billing by the Contractor should be in the name of "Chief Engineer (W.R.), WAPCOS Limited, Regional Office: 515, 5th Floor, Shree Ugati Corporate Park, Opp. Pratik Mall, Koba-Gandhinagar Road,Kudasan, Dist. Gandhinagar, Gujarat-382421, Gujarat" bearing the GSTIN: **24AAACW0764A1ZV**". In this type of billing, GST will be applicable as per the GST slabs. The GST charged shall be reimbursed by WAPCOS Limited on submission of following documents (proof of GST paid and filing): 1) GSTR-1 2) GSTR-3 3) GST Challan. Each RA bill should be enclosed with certified measurement sheets, certified by Engineer in Charge after verification of the requisite quality test reports, if any, as per the relevant standards. The minimum interval between two such RA bills shall be 30 days. WAPCOS shall make the payment of bills to the contractor only after receipt of the payment from Gujarat Natural Farming Science University, Gujarat. Other Taxes will be deducted as per government norms.

Deduction of GST From Bill: The following tax Deduction shall be made from each bill payable to the contractor. (1) 1% of value of amount payable towards SGST, (2) 1% of the value of amount payable towards CGST. TDS for taxes deducted will be issued to the contractor. (F.D. GR NO.GST/1017/1097/GST cell dated 15-09-2018)

Clause 49: Site Offices and Facilities

With respect to furnished office accommodation & monthly and communication to be provided by Contractor to Authority, states that "On account of furnished project office equipped with all facilities such as telephone, fax, internet, photocopier, computer, laptop & A-3 color printer along with operator, regular electric & purified drinking water supply and inspection vehicle etc. as per the requirement of the project an amount equal to 1% of gross bill from all running account & final bill will be recovered. The contractor shall also make sufficient arrangement for Photography/videography preferably by maintaining a camera/video camera at site so that video photographs can be taken of a 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.

Contractor has to provide latest model Two brand new high end model fully loaded vehicle of latest make with SUV Car or as per approved by Officials. shall be provided to the employer within 30 days of the work order. All expenses required for keeping the vehicle in smooth running conditions such as fuel, lubrication oil & other consumable, necessary service & maintenance, drivers having valid license repairs & replacement etc. are to be met by the contractor. In the event of any vehicle being off the road for maintenance or on account of break down. The contractor shall provide substitute vehicle immediately. If the contractor at any time fails to provide vehicle or substitute vehicle as specified above an amount of Rs.1000.00 per day or part, thereof for each vehicle shall be debited to the contractor's account. All necessary taxes for operating the vehicle shall be fully paid by contractor & all necessary papers shall be provided as required by prevailing motor vehicles Act. With comprehensive insurance cover for the vehicle. The vehicle will be at disposal of office and will be used at any work of office. The vehicle will month kept in Office up to completion of work. After the work completed vehicle will be returned to the contractor. The owner ship of the vehicle will be of contractor.

Contractor has to provide latest model All in One computer & One Laptop having I-7, 13th generation processor with 8 GB RAM, 256 GB SSD +1TB Hard Drive & 4 GB Video Graphic card with latest Windows. Home Plus facility of HP/Dell/Apple with one all in one Canon Colour Printer for exclusive use of office staff contractor has to be provided it within 15 days from date of work order otherwise penalty Rs.500/- per day.

The Contractor shall dismantle and remove from site all such temporary structures on completion of contractor or whenever required by the employer.

This clause shall prevail on all the other clauses mentioned in this respect in the contract.

Clause 50:-Integrity Pact

Integrity Pact duly signed by the Bidder shall be submitted as per format enclosed in Annexure 5. The party may be required to sign an Integrity Pact; and WAPCOS Limited will have the right to ask the bidders, or its suppliers, contractors and consultants to permit WAPCOS Limited to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by WAPCOS Limited at the cost of the bidders.

Clause 51:-Change of Scope (Variations) and Procedure for change of Scope:

51.1 The Contractor/Bidder may require the 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. Contractors, in that event, will have no further claim on the ground that had it been known / disclosed earlier he would have made such charges in other connected work in their design, construction which would have saved him some cost and given him other consequential benefits.

51.2 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 (such as addition of extra plinth area) which are not included in the scope of work including any additional test on completion

51.3 In the event of the Contractor/Bidder determining that a change of scope is necessary, it shall issue notice to the Contractor. **The Contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge.**

51.4 Upon receipt of change in scope notice, the Contractor shall with due diligence, provide to the Contractor/Bidder through the Engineer-in-Charge within seven days' time such information as is necessary together with documentation in support of;

a) The impact, if any, which the change in scope is likely to have on the completion of the work
b) The options for implementing the proposed change of scope and the effect, if any, each on the cost and time thereof.
c) break down of quantities, unit rates and cost for different items of work d) proposed design for the change of scope
e) Proposed modifications, if any, to the construction period with updated work programmes (all Variations shall be included in updated Programmes produced by the . Contractors).

51.5 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, be extended, if requested by the . Contractor, as follows;

i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus
ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

51.6 The Contractor/Bidder shall assess the change in scope of proposal and . Contractor's quotation and upon reaching an agreement; the Contractor/Bidder shall issue the Change Scope Order requiring the . Contractor to proceed with the performance thereof.

51.7 The Contractor shall not be entitled to additional payment for costs, which could have been avoided by giving early warning.

51.8 The rate of extra/ additional and substituted items shall be determined in accordance with procedure indicated under **clause-35 of Part-A of Section-IV.**

51.9 The total value of given scope of work "thus ordered" shall not exceed the total contract price for the construction work.

51.10 The Engineer-in-Charge will be competent to approve change in scope of work upto Rs. 1.00 Crore (cumulative). However, change in scope of work beyond Rs. 1.00 Crore shall be approved with the approval of competent authority.

Clause 52: Payments for Change of Scope (Variations):

The rates for extra/ additional and substituted items of Work as are required to be executed due to variations, as stated in Clause above shall be payable in the manner as stated hereunder:

52.1 In the case of extra item(s) (items that are completely new), the Contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis, for the work and the Engineer-in-Charge shall within one month of the 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 the Contractor shall be paid in accordance with the rates so determined. Market Rate shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the time of commencement of execution of the item, where the work is to be executed, plus 15% percentage towards all overheads and profits.

52.2 In case the extra item(s) being the Scheduled Item (Schedule of rates), these shall be paid as per the schedule rate at the time of award of work plus/minus tender percentage with respect to estimated cost.

52.3 In case the rate for the substituted item & agreement item (to be substituted) both exists in Schedule of rate at the time of award of work, then the differences rate of both the item shall be paid/ recovered.

52.4 In case the rate for the substituted item & agreement item (to be substituted) both are not exists in Schedule of rate at the time of award of work, then the rate for the agreement item and substituted item shall be determined in the manner as mentioned in the following para.

a) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the Contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

b) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so

decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

Clause 53: Liquidated Damages for delay:

53.1 (i) If the Contractor fails to complete the work under contract by the stipulated date, he shall payliquidated damages of at the rate of 0.1 percentage of the contract value per day from the date of delaying the said work upto the date of completion and handing over to the University.

(ii) However also if the contractor fails to complete any part of the work as designed in Schedule (c) by the time indicated against such part, he shall pay Liquidated damages per day from the date of delaying the said part of the work up to the date of completion of the said designated part at the rates shown in the said

schedule of the contract value of such part for such failure till the said designated part. is completed.

(iii) The aggregate maximum of liquidated damages payable under clause No.2 Shall not exceed 0.10 Percentage of contract value per day and shall be subject to the maximum amount of 10 percentage of the estimated amount put to tender.

(iv) Delays requiring payment of ten percentage liquidated damages of the amount put to tender for performance shall be sufficient causes for termination of contract and for forfeiture of security deposit including amount of performance bond in respect of works estimated to cost more than Rs.15 lacs, for. Performance and registration of the contractor shall also be kept in abeyance for three years from the date as fixed in all cases.

53.3 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.

53.4 The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Government. In case, the Contractor does not achieve a particular mentioned milestone in schedule as per accepted Construction Schedule, or the re-scheduled milestone (s) if any, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. Withholding of this amount on failure to achieve a milestone, shall be automatic without any notice to the Contractor. However, if the Contractor catches up with the progress of work on the subsequent milestone(s) the withheld amount shall be released.

53.5 In case the Contractor fails to make up for the delay in subsequent milestone(s) amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever shall be payable on such withheld amount.

Clause 55: Price variation for–

The amounts payable to the contractors for the work done involving use of cement, steel and asphalt when the Government as for schedule A does not supply these materials shall be adjusted for increase or decrease in the rates of these materials as under

Sr.No.	Item	Qty	Star Rate Rs	Month in which DTP is approved
1.	Steel Fe500D	MT		January 2024
	8mm	Per MT	62780/-	
	10mm	Per MT	61399/-	
	12mm	Per MT	60400/-	
	16mm	Per MT	60400/-	
	20mm	Per MT	60000/-	
	25mm	Per MT	60400/-	
	32mm	Per MT	61399/-	
2.	Cement	Per Bag(50 Kg)	382/-	

The above star rates are linked with Reserve Bank of India price index for steel and cement for the month in which the DTPs are approved. The month in which DTP are approved will be specified in the tender document. The star rate should be mentioned in the tender copy as under:-

I. For Cement, Price of cement from authorized dealer should be obtained for the month in which the D.T.P. are approved & mentioned as star rate before issue of tender copy.

II. For steel & H.Y.S.D. bars, rate of SAIL should be obtained for the month in which the DTPs are approved and mentioned as star rate before issue of tender copy

II(b) For asphalt the star rate is based on koyali Refinery Prevailing in the month which DTP is approved and should be mentioned before issue of tender copy.

III. For basic index specific month in which the DTPs are approved should be mentioned before issue of tender copy.]

The fluctuations in rates of cement and steel shall be adjusted in the bills payable to the contractor as under :

$$A = B \times \left\{ \frac{C_1}{C_0} - 1 \right\} \times D$$

A = Difference of Amount payable or recoverable

B = Star rate of steel / cement / asphalt / MS Plate / HR Coil.

C1 = The (quarterly) average corresponding index for steel, cement, asphalt, MS Plate/ HR Coil for the quarter under consideration (as published in monthly bulletin or Ministry of Commerce and Industry Govt. of India.

Co.- Price index of cement/steel asphalt / MS Plate / HR Coil for the month in which the DTPS are approved published in monthly bulletin of Reserve Bank of India.)

D – Qty. of cement / steel / asphalt actually brought by the contractor on site of work and consumed in the work during quarter duly supported with bill as recorded in the cement consumption register or MB (for steel).

Condition for variation in prices of Cement and steel only

1. No Ceiling for escalation for difference in the cost of Steel, Cement will be applicable
2. This clause shall be operative from the date of issue of work order and up to the expiry of original and extended time limit.
3. This formula shall be used individually for Cement, Steel CRS/TMT / HYSD steel for calculating adjustment.
4. The Cement, Steel & MS pipe brought by the contractor on site of work shall be used only after the same is approved by the Department.
5. If such materials are not found as per the requirement of I.S. specification, the same shall be removed by the contractor for which no claim shall be entertained.
6. This clause will be applied to the work irrespective of the cost of the work (vide R & B D.G.R. No TNC /1089/(4) /C dtd.21/10/05)

For & on behalf of Tenderer

FORMAT
LETTER OF ACCEPTANCE

No.
Dt.
To
(Name of Contractor)
Address: _____
Place: _____
Contact Details: _____
Email: _____

Subject: **"CONSTRUCTION FOR GUJARAT NATURAL FARMING SCIENCE UNIVERSITY, AT JAMBUDI VILLAGE, TALUKA HALOL, PANCHMAHAL DISTRICT (GIRLS HOSTEL, KITCHEN & DINNING HALL, GUEST HOUSE, E-2 TYPE QUARTERS, B-TYPE QUARTERS, D-TYPE QUARTERS, B-B1 TYPE QUARTERS, SANITATAION WORK, COMPOUND WALL)"**

Reference: _____

Gentleman,

WAPCOS is pleased to inform you that your bid has been accepted for the work of CONSTRUCTION FOR GUJARAT NATURAL FARMING SCIENCE UNIVERSITY, AT JAMBUDI VILLAGE, TALUKA HALOL, PANCHMAHAL DISTRICT (GIRLS HOSTEL, KITCHEN & DINNING HALL, GUEST HOUSE, E-2 TYPE QUARTERS, B-TYPE QUARTERS, D-TYPE QUARTERS, B-B1 TYPE QUARTERS, SANITATAION WORK, COMPOUND WALL)"vide letter under reference _____for **the quoted price of** Rs._____/- (Including GST) (Rupees In Words Only) which is ___ % below/above the estimated cost of **Rs. 32,49,19,450.00** (Rupees Thirty Two Crore Forty Nine Lakh Nineteen Thousand Four Hundred Fifty Only) in accordance to the terms & conditions and work specifications prescribed in the Tender documents vide reference No. ___

We confirm having accepted your proposal submitted on _____ N-procurement Portal read in conjunction with all specifications, Terms and conditions of the Tender Document and award you the contract for the said work.

With reference to the Tender Clause No. 1 of SCC, you are requested to submit the Performance Guarantee in form of Bank Guarantee @5% of Contract Amount (i.e. 5% of Rs. _____/- = Rs. _____/-) (Rupees In words Only) from Nationalized / RBI approved commercial bank as per prescribed format in the tender document.

The contractor shall also insure the work and submit the necessary Insurance policies as specified in the tender document.

The time limit for completion of project works shall be **24 months (inclusive of Monsoon Period)** from the date of Letter of Commencement. As it is prestigious project for WAPCOS, you are directed to complete the work within stipulated time limit.

The payment terms conditions given in the tender document shall be followed by the contractor.

Kindly return the duplicate copy duly signed and stamped on each page by Authorized signatory as proof of Acknowledgement and confirmation.

You are further directed to execute the Contract Agreement on Non-Judicial stamp paper of appropriate value within 15 days of the date of this letter.

This letter shall be part and parcel of the tender document.

Yours truly,
For WAPCOS LIMITED

Sr. Project Manager (W.R.)

ANNEXURE

FORM OF ADVANCE PAYMENT GUARANTEE

M/s WAPCOS Limited,

……

……

In consideration of WAPCOS LTD. (hereinafter referred to as "the Employer") which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to (Contractor's name) with its Registered / Head Office at (hereinafter referred to as "the Contractor "which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) a contract, by issue of Employer's Notification of Award No_____dated and the same having been unequivocally accepted by the Contractor, resulting into a contract valued at Rs. (Rupees _____only) for_____ (hereinafter called "the contract") and the Employer having agreed to make an advance payment to the Contractor for performance of the above Contract amounting to Rs._____(Rupees _____only) as an advance against bank guarantee to be furnished by the Contractor.

We, _____(name & address of bank) having its Head Office at (hereinafter referred to as "the Bank" which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer immediately on demand any or, all monies payable by the Contractor to the extent of Rs. _____ (Rupees _____only) as aforesaid at any time up to _____without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that the Guarantee herein contained shall be irrevocable and shall continue to be enforceable till the Employer discharges this guarantee. We further agree that no change in the constitution of the Bank or of the Employer shall affect this guarantee.

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from time to time, to vary the advance or to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would but for this provision, have the effect of relieving the Bank.

The bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

We The Said Bank do hereby declare that we have absolute and unconditional power to issue this

guarantee in your favor under the Memorandum and Articles of Association or such other constitutional documents of the Bank and the undersigned have full power to execute this guarantee under the Power of Attorney/ Post Approval Authorization dated of the bank granted to him / us by the Bank. We the said bank do hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the powers of the bank or its officials and the guarantee shall be deemed to have been issued as if the bank and its officials have all the powers and authorization to give this guarantee on behalf of the bank.

We the said bank does hereby certify the genuineness and appropriateness of the Stamp paper and stamp value used for issuing the guarantee. We the said bank does hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the stamp paper or its stamp value.

We the said bank do hereby declare that our payments hereunder shall be made to you , free and clear of and without and deduction, reduction on account of any reasons including any and all present and future taxes, levies, charges of withholding whatsoever imposed or collected with respect thereto.

Notwithstanding anything contained hereinabove our liability under this guarantee is limited to Rs._____(Rupees _____only) and it shall remain in force upto and including _____and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/S _____on whose behalf this bank guarantee has been given.

Notwithstanding anything contained herein:

i) Our liability under this guarantee shall not exceed Rs. (Rupees_____only);
ii) This bank guarantee shall be valid up to _____ and
iii) We are liable to pay up to the guaranteed amount only and only if we receive from you a written claim or demand within the claim period not later than 12 months from the said expiry date relating to default that happened during the guarantee period and shall your rights under this Bank Guarantee shall be extinguished and our liability under the Bank Guarantee shall stand discharged unless such written claim or demand is received by us from you on or before _____ being the date of expiry of the claim period. (**Indicate a date one year after validity of guarantee**).

Dated this _____day of _____at Gurgaon

WITNESSES

1
(Signature)
(Name)

(Official address)

2
(Signature)
(Name)

(Designation with bank stamp)

Attorney as Power of Attorney
(Signature) No.

Dt._____

(Name)

SECTION– IV
SPECIAL CONDITIONS OF CONTRACT

SECTION–IV

SPECIAL CONDITIONS OF CONTRACT

1.0 SPECIAL CONDITIONS OF CONTRACT

The Special Condition of Contract (SCC) shall be followed by the Contractor in addition to the General Condition of Contract (GCC) of tender document. The following General Condition of Contract of this tender are modified/added as detailed below. In case of any discrepancy between GCC and SCC, the SCC will succeed over GCC.

Clause No.	Description	Applicability/Modified/ Added
GENERAL RULES AND DIRECTIONS		
8	Schedule of Materials to be issued to the Contractor	Not Applicable
19	List of works from	Not Applicable
DEFINITIONS		
Added	Owner/Client / GNFSU shall means Gujarat Natural Farming Science University.	
2(iii)	Work / Project Means: **As Mentioned in NIT**	
2(iv)	Site / Location Means **As Mentioned in NIT**	
2 (vi& Vii)	Engineer-In-Charge& Accepting Authority Will be intimated to the successful Bidder at the time of issue of Notice to Proceed the works.	
2 (x)	Market Rate Percentage on cost of materials and labor to cover all overheads and profits	15%
2(xi)	Standard Schedule of Rates Schedule of Rates (Civil) Schedule of Rates (Electrical)	 R&B, Gujarat 2023-24 R&B, Gujarat (E&M) 2023-24
2(xvi)	Date of Commencement of work	15 days after date of award of Work
CLAUSES OF CONTRACT		
Clause 1	Performance Guarantee i. Performance Guarantee. ~~**ii. Performance guarantee if contractor quotes abnormally low**~~	**Applicable** 5% of Tendered Value The confirmation of Bank Guarantee submitted by bidder to WAPCOS shall be sought from issuing bank through SFMS only as per details given below: **Indian Overseas Bank,** **NHB Gurgaon, Branch Code 1935** **IFSC Code: IOBA0001935** **Beneficiary : WAPCOS Limited** ~~**The amount of 3% of Performance Bank Guarantee (PBG) will increase if L1 Bidder will quote abnormally low cost. The additional amount of PBG will be the difference of average quoted cost of all the other bidders who have participated in the bidding process and cost quoted by the L1 bidder who has quoted abnormally low. The decision to decide**~~

Clause No.	Description	Applicability/Modified/ Added
		~~abnormally low cost will be in full discretion of the tender evaluation committee of WAPCOS.~~
	iii. Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance. iv. Validity of Performance Guarantee v. Release of Performance Guarantee	15 days The Performance Guarantee shall be valid up to completion of project plus DLP period (5 Years). In case the time for completion of work gets extended, the contractor shall get the validity of Performance Guarantee extended to cover such extended time for completion of work and DLP period of 5 years. After successful completion of the DLP period (5 Years), the performance guarantee shall be returned to the contractor.
Clause 1A	Security Deposit	Applicable 2.5% Tender value in the form of (in form of FDR) & 2.5% of Tendered Value recoverable from RA Bills
	Release of security Deposit	Successful Completion of Defect Liability period (5 year after handing over of the site to the University Officials) without any interest.
Clause 2	**Compensation for Delay**	**Applicable** 0.10 Percentage of contract value per day and shall be subject to the maximum amount of 10 percentage of the estimated amount put to tender. Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Estimated amount put to tender
Clause 2A	Incentive for Early Completion	Not Applicable
Clause 3A	Start of Work	Not Applicable
Clause 5	Time and Extension for Delay	Applicable
	Number of days from the date of issue of letter of acceptance for reckoning date of start	15 days
	Stipulated time of completion of project	**As Mentioned in NIT**
Clause 6	Measurements of Work Done	Applicable
Clause 6A	Computerized Measurement Book	Applicable
Clause 7	Payment on Intermediate Certificate to be Regarded as advance	Not Applicable
New Clause 7A (Added)	Payment	The Bidder (Contractor) acknowledges that under the present Contract/ Agreement/ Work Order/ Arrangement, WAPCOS is only working as intermediary between Gujarat Natural Farming

Clause No.	Description	Applicability/Modified/ Added
		Science University, Jambudi Village, Taluka halol, Panchmahal District being Principal Employer/ Client and Bidder (Contractor). Thus the Bidder (Contractor) unconditionally acknowledges that the payments under the present contract/ Agreement/ Work Order/ Arrangement shall be made proportionately by WAPCOS only on back to back basis i.e. after 21 days subject to receipt of payment from Gujarat Natural Farming Science University, Jambudi Village, Taluka halol, Panchmahal District being Principal Employer/ Client. The Bidder (Contractor) also unconditionally agree that in the event the payment or part thereof, under the present Contract/ Agreement/ Work Order/ Arrangement is not received from Gujarat Natural Farming Science University, Jambudi Village, Taluka halol, Panchmahal District (Principal Employer/ Client), then WAPCOS &/or any of its Employee/ Officer shall not be responsible to pay any amount to Bidder (Contractor). The said condition shall supersede any and all other conditions of Contract/ Agreement/ Work Order/ Arrangement between the parties. All payments shall be released by way of e-transfer through RTGS (bank charges borne by agency) in India directly at their Bank account by WAPCOS.
Clause 10	Materials Supplied by WAPCOS	Not Applicable
Clause 10A	Materials to be Provided by Contractor List of Testing Equipment to be provided by the Contractor at site lab **1.** Cube Testing Machine along with sufficient numbers of cube moulds **2.** Set of Sieves for testing of Coarse & fine aggregate along with shaker, glass jars etc. **3.** Slump Cone **4.** Vernier Calliper, Screw Gauge, Wire gauge **5.** Weighing Balance with weights **6.** Incubator/ oven **7.** Rebound Hammer **8.** **Computerized digital weighing Concrete**	Applicable

Clause No.	Description	Applicability/Modified/ Added
	<u>Batching plant of capacity 18-30 Cum/hour</u> **9.** Water testing equipment **10.** Require equipment for cement testing at site. **11.** Aggregate impact testing equipment, flakiness testing equipment and other required apparatus for aggregate testing **12.** For testing of Design Mix Concrete at site, necessary testing equipment and facility (as per BIS) shall be made available by Contractor as and when required by Engineer-In-Charge or his authorized representative and nothing extra shall be paid on account of this. (Note: Other equipment which are required as per scope of work (Note: The listed equipment / instruments will be installed at his own cost by Contractor in laboratory room which to be constructed by the Contractor at his own cost/ tie up with NABL Approved Laboratory within 10 Km of site location).	
~~Clause 10 B(i)~~	~~Secured Advance on Non-Perishable Materials~~	~~Applicable~~ ~~("Percentage 90% is modified as 80% of the assessed value of any material)~~ ~~In social welfare bid~~ ~~Applicable~~ ~~75% of the assessed value of any material.~~ ~~**Recovery of Secured Advance:**~~ ~~Recovery shall be made by the deduction from the contractors bills commencing after first 30% of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 30% in such a way that the entire advance is recovered by the time 80% of the gross value of the contract is executed and paid.~~
Clause 10 B(ii)	Mobilisation Advance	Mobilization advance 10% of the tendered value will be given to the contractor in one month of the

Clause No.	Description	Applicability/Modified/ Added
		order to commence the work. Such advance shall be in two or more installments to be determined by the Engineer-in-Charge at his sole discretion. The first installment of such advance shall be released by the Engineer-in-Charge to the contractor on a request made by the contractor to the Engineer- in-Charge in this behalf. The second and subsequent installments shall be released by the Engineer- in- Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge. Before any installment of advance is released, the contractor shall execute a Bank Guarantee Bonds not more than 6 in number from Scheduled Bank for the amount equal to 110% of the amount of advance and valid for the period till recovery of advance. This (Bank Guarantee from Scheduled Bank for the amount equal to 110% of the balance amount of advance) shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery.
Clause 10 B(iii)	Plant Machinery & Shuttering Material Advance	Not Applicable
~~Clause 10 B(iv)~~	~~Recovery of Mobilization advance~~	~~Not Applicable~~
~~Clause 10 C~~	~~Payment on Account of Increase in Price / Wages due to Statutory Order.~~	~~Not Applicable~~
Clause 10 CA	Payment due to Variation in Prices of Materials after Receipt of Tender	Not Applicable
Clause 10 CC	Payment due to Increase / Decrease in Prices / Wages (Excluding Materials covered under Clause 10 CA) after Receipt of Tender for Works	Not Applicable
Clause 11	Works to be Executed in Accordance with Specifications, Drawings, Orders Etc. Specifications to be followed for execution of work	Applicable The following is added: All works are to be executed in accordance with the specifications, all drawings, details of items etc. given with this tender document and vetted design/drawing by WAPCOS. In case specification of any item is not clear, R&B Building Specification booklet/CPWD Specifications 2009 Vol. I to II with up to date correction slips issued on the last date of submission of tender for Civil work is applicable.

Clause No.	Description	Applicability/Modified/ Added
Clause 12	Deviations / Variations Extent and Pricing	
	Clause 12.1	Not applicable
	Clause 12.2(a)	Modified as "In the case of extra item(s) (items that are completely new and not in the scope of works as per tender condition and non-scheduled item within R&B SOR-2023-24) the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis on the basis of the market rates. Contractor shall be paid in accordance with rate approved by WAPCOS including applicable Goods and Service Tax (GST). In case the extra item being the Scheduled Item (R&B, Gujarat – 2023-24), these shall be paid as per R&B SOR-2023-24 after dividing by the rate by 1.18.The applicable Goods and Service Tax (GST).
	Clause 12.2(b)	Modified as "The specification mentioned in Tender may be substituted as per the requirement of Owner/ WAPCOS. • In case the extra item being the Scheduled Item (R&B SOR 2023-24), these shall be paid as mentioned in the schedule rate Including applicable GST, and as approved by WAPCOS. • In this case of substituted item(s) being Non SOR item, the contractor shall submit proper analysis on the basis of the market rates after direction engineer-in-charge. • The rate of tendered item to be substituted will also be assessed by same above manner. The plus/minus difference of rates of mutually substituted items will be submitted by Contractor and approved by WAPCOS. Accordingly the plus/minus difference of payment will be made to the Contractor for the substituted quantities.
	Clause 12.2(c) Deviation Limit beyond which clauses 12.2 shall apply for all items other than foundation work (except earthwork) as mentioned in clause 12.5. Clause 12.5 (i) Deviation limit beyond which clause 12.2 shall apply for foundation work (except earth work)	Project & Original Works 40% 40%

Clause No.	Description	Applicability/Modified/ Added
	(ii) Deviation limit for items in 100% earth work.	100% Modified as "In the case of deviated item(s) beyond the % mentioned above (non-scheduled item within R&B SOR-2023-24). The contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis on the basis of the market rates. Contractor shall be paid in accordance with rate approved by WAPCOS including Goods and Service Tax (GST) on work contract. In case the deviated item, beyond the % mentioned above, being the Scheduled Item (R&B SOR 2023-24), these shall be paid as mentioned in the schedule rate including applicable GST, and as approved by WAPCOS.
	Clause 12.3, 12.4	Not Applicable
Clause 15A	Compensation in case delay supply of material	Not Applicable
Clause 17	Contractor liable for Damages, Defects during Defect Liability Period Defect Liability Period	Applicable Added/ Modified: 5 (Five years) from the date handing over to Gujarat Natural Farming Science University, Jambudi Village, Taluka halol, Panchmahal District with all satisfaction & acceptance along with submission of all the required documents i.e. As- built drawings (minimum 5 sets), Inventory list, guarantee / warranty bonds, certificates & invoices of equipment. The cost of providing the Defect Liability Service stated in the of this clause are to be borne by the contractor and shall be deemed to be included in the percentage rate quoted by the contractor
Clause 25	Settlement of Disputes and Arbitration	Modified as: Any dispute, controversy or claims arising out of or relating to this Contract Agreement (Agreement that will be signed between WAPCOS and Bidder, if work is awarded to bidder), or the breach termination or invalidity thereof shall be settled through following mechanism: a) Firstly, the aggrieved party shall write a letter to the other party detailing its grievances and calling upon the other party to amicably resolve the dispute by convening a joint meeting. Accordingly, the parties as per their convenience shall jointly convene the said meeting(s), wherein minutes of the said meeting(s) shall be prepared and countersigned by all the parties it is mandatory to prepare minutes of meeting(s)

Clause No.	Description	Applicability/Modified/ Added
		and to be countersigned by all the parties, irrespective of the outcome of the said meeting(s). b) In the event the parties are unable to reach on any settlement in the said meeting(s), then the aggrieved party shall mandatory resort to pre-litigation mediation mechanism with Delhi High Court Mediation Cell, New Delhi. c) It is only upon failure of the pre-litigation mediation mechanism with Delhi High Court Mediation Cell then the aggrieved party shall resort to resolution of disputes through arbitration of a Sole Arbitrator. The appointing authority of Sole Arbitrator is CMD, WAPCOS Limited, to which neither of the parties have any objection nor they shall ever object. d) Subject to the parties agreeing otherwise, the Arbitration proceedings shall be conducted in accordance with the provisions of the Indian Arbitration and Conciliation Act, 1996 (amended as on date). e) It is also acknowledged and accepted that WAPCOS is only working as Intermediary between the Bidder (Contractor) and Gujarat Natural Farming Science University, Jambudi Village, Taluka halol, Panchmahal District being Principal Employer, thus in the event, any dispute arises under the Contract Agreement (Agreement that will be signed, if work is awarded to bidder) and referred to Arbitration for adjudication, then subject to corresponding clause in the Memorandum of Agreement between Gujarat Natural Farming Science University, Jambudi Village, Taluka halol, Panchmahal District and WAPCOS, Gujarat Natural Farming Science University, shall also be made party to the said Arbitration proceedings. Also, the award including costs if any passed against WAPCOS and costs incurred in the proceedings shall be the sole responsibility of Gujarat Natural Farming Science University, The said clause if found inapplicable, even then the other terms of the Arbitration Clause shall survive and shall be acted upon. f) The place/ seat of arbitration shall be Delhi and any award whether interim or final, shall be made, and shall be deemed for all

Clause No.	Description	Applicability/Modified/ Added
		purposes between the parties to be made, in Delhi. The arbitral procedure shall be conducted in English language and any award or awards shall be rendered in English. The procedural law of the arbitration shall be Indian Law. The award of the arbitrator shall be final and conclusive and binding upon the Parties. g) The Contract and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the laws of India and the Parties submit to sole & exclusive jurisdiction of courts at Delhi/ Gandhinagar (Gujarat)
Clause 27	Lump sum Provisions in Tender	Not Applicable
Clause 30	Employment of coal mining or controlled area labour not permissible	Not Applicable
Clause 32	Alternate water arrangements	Not Applicable
Clause 33	Return of surplus material	Not Applicable
Clause 34	Hire of plant and Machinery	Not Applicable
Clause 42	Return of Material & Recovery for Material Issued	Not Applicable
Clause 43	Compensation During War Like Situation	Not Applicable
Clause 46	Insurance	Applicable
~~Clause 47:~~	~~Conditions Specific To Green Buildings Practices~~	~~Applicable for GRIHA 3 Star Rating~~ **~~MANDATORY~~**
Clause 48 (Sr. no 3 & 4)	Sr. No. 3: Certificates of Payment and Sr. No. 4: Payment	Not Applicable
Clause (49)	**Payment Terms**	**The payment to be made to the contractor on measurement basis, only after the verification of bill by Engineer in Charge and to be approve by competent authority.** ***All interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the***

Clause No.	Description	Applicability/Modified/ Added
		contract and specifications. Any interim payment or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contractor any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

2.0 ADDITIONAL CONDITIONS

1. The Contractor shall be responsible for consequential effects arising out during the inspection done by the Chief Technical Examiner Cell, Central/State Vigilance Commission or Committee constituted by the Gujarat Natural Farming Science University or site visiting team of GNFSU/ WAPCOS or State Level Officers or by the Building Works Committee or Third Party authorized by WAPCOS or any Statuary Committee or by Committee constituted by WAPCOS or by any duly authorized representative of WAPCOS, during the progress or any time after the construction and development of project up to the defect liability period, and will take appropriate action for rectification of defective work and modifications as suggested by the above teams/ group/ individual. Rectification of defective works or replacement of sub-standard materials or articles or modifications, as pointed out by the Chief Technical Cell, Central Vigilance Commission, Committee constituted by the Gujarat Natural Farming Science University, construction site visiting team of GNFSU/ WAPCOS, Building Works Committee or authorized representative of WAPCOS or third party authorized by WAPCOS/ GNFSU or any statuary committee, will be carried out or replaced/ modified by the Contractor at his own risk and cost. WAPCOS will not pay any extra amount for such rectification or replacement.
2. With respect to furnished office accommodation & monthly and communication to be provided by Contractor to WAPCOS, states that "On account of furnished project office equipped with all facilities such as telephone, fax, internet, photocopier, computer/laptop & printer along with operator, regular electric & purified drinking water supply and inspection vehicle etc. as per the requirement of the project an amount equal to 1% of gross bill from all running account & final bill will be recovered. The contractor shall also make sufficient arrangement for Photography/videography preferably by maintaining a camera/video camera at site so that video photographs can be taken of a 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.
   The Contractor shall dismantle and remove from site all such temporary structures on completion of contractor or whenever required by the employer.
   This clause shall prevail on all the other clauses mentioned in this respect in the contract.
   If any official of contractor is not following the directions of WAPCOS in the best interest of work in that case. WAPCOS has full authority to get replaced that official from site of work with prior notice.
3. ~~All the rules and regulations about the Labour working at site and mandatory as per the State Government and Central Government departments will be followed by the contractor. If any issue arises in this regard will be resolved by the contractor. Contractor is liable to extend the benefits as provided under the various statutory and labour laws and other relevant applicable laws to its workforce. EPF/ ESI and other labour laws being followed by State/ Central Government norms and further amendments time to time would be followed by contractor. WAPCOS will not be a party for the issues related to EPF/ ESI. If any type of the miss-happening during the execution of the project (i.e. Injury/ Mobilization/ Loss/ Theft etc.) & the responsibility of skilled and un-skilled labor or any legal matter involved in this matter in the concerned jurisdiction will be borne by Contractor only.~~
4. Contractor shall submit all the Guarantee/ Warranty bond for the water proofing for 05 years of service warranty and Anti-Termite Treatment works for 5 years of service warranty. From the date of completion of Project works and deliver Insurance Policies, if any, of Works still current at the time of handing over of works. **The work of anti-termite treatment should be done through specialized agency.**
5. **Handing Over of the Project**: Contractor will hand over the project to Owner/Client after successful completion of each component of the project along with submission of all the required documents i.e. As-built drawings, Inventory list, guarantee / warranty bonds, certificates & invoices of equipment, lock and key of each room and NoCs form various Departments with complete satisfaction and acceptance by Gujarat Natural Farming Science University. Contractor

shall provide necessary Completion Certificate/ NOC from all local Government/ Statuary Authorities including Fire, Forest, Electrical, Environment, Lift, DG Set, Complete inventory list, etc. duly signed as-build drawings, required before handing over the project to the client. The partial handing over of works components shall not be considered. Defect Liability period of Five year will start after handing over of the site to the University Officials of each component of the project and handing over to Gujarat Natural Farming Science University with all satisfaction & acceptance along with submission of all the required documents i.e. As- built drawings, Inventory list, guarantee / warranty bonds, certificates & invoices of equipment, lock and key of each room and NoCs form various Departments of GNFSU.

6. All the modifications and any additional works (basic requirement after use of premises by user) suggested by client at the time of handing over of the project and after occupancy of premises by client during Defect Liability Period must be taken up by contractor without any disputes.
7. The contractor shall deploy the resources at site to start the construction after clearance from the Owner of the project and subsequent written approval from WAPCOS. No claim shall be entertained for idle labour, idle machinery, idle technical / non-technical staff, idle T&P if any, due to delay in start of the works.
8. Contractor shall deploy adequate technical manpower / expert of each relevant fields as per the scope and requirement of work during execution of work at site which are mandatory as per the standard guidelines.
9. If any dispute/ hindrance may arise during construction due to any reason whatsoever, the contractor is not liable for any financial claim or damages due to such circumstances.
10. All mass Reinforced Cement Concrete work shall be design mix concrete of specified grade and initial design mix shall be carried out from the Govt. approved Laboratory/NABL accredited lab/ NIT/IIT.
11. The Contractor shall render all help and assistance in documenting the total sequence of this project by way of photography, slides, etc. nothing extra shall be payable to the agency on this account.
12. Contractor should provide R.O. Plant sufficient for workers employed at site, his technical staff and site staff.
13. Quoted rates by contractor shall be firm and fixed for entire contract period as well as extended period for completion of the works. No escalation shall be applicable on this contract.
14. The contractor shall make his own arrangements for obtaining electric connection and water Connection/arrangement (if required). The water charges and electricity charges as charged by the client/ owner and Local Authorities will be paid by the Contractor. No dispute in this regard shall be entertained.
15. The Contractor shall dispose of all the dismantled materials, debris, garbage, waste outside of the campus of the works at his own cost and provide clear and clean site at the time of handing over the works
16. The payment of final bill will be made after successful completion and handing over of the works with complete satisfaction of Engineer In-Charge, WAPCOS, as well as representative of GNFSU.
17. Some restrictions may be imposed by the security staff etc. on the working and for movement for labour materials etc. The contractor shall be bound to follow all such restrictions / instructions and nothing extra shall be payable on this account.
18. The contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignment, the level and correctness of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the contractor at his own cost to the instructions and satisfaction of the Engineer-in-Charge.
19. The cost/rates quoted by the contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark, spot levels, construction of all safety and protection devices, barriers, earth embankments, preparatory works, all testing of materials working during monsoon, working at all depths, height and locations etc. unless specified in the schedule of quantities.

20. Royalty at the prevailing rates (as per the GFR's 2017) wherever payable shall have to be paid by the contractor on the boulders, Earth, metal, shingle, sand and bajri etc. or any other material collected by him for the work direct to revenue authorities and nothing extra shall be paid by the department for the same. The receipt of the same shall be provided by the contractor if required by WAPCOS/ GNFSU/ Govt. Agencies. No such claim of Contractor on royalty shall be entertained by the WAPCOS
21. The contractor shall provide at his own cost suitable weighing, surveying and leveling and measuring arrangements as may be necessary at site for checking. All such equipment shall be got calibrated in advance and periodically from laboratory, approved by the Engineer-in-Charge. Nothing extra shall be payable on this account.
22. The contractor shall comply with proper and legal orders and directions of the local or public authority or municipality and abide by their rule and regulations and pay all fees and charges which he may be liable.
23. The contractor shall give a performance test of the entire installation (s) as per standing specification before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.
24. Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been in-built in the items and nothing extra shall be payable (or) extra cement considered in consumption on this account.
25. Samples of various materials required for testing shall be provided free of charges by the contractor. Testing charges, if any, unless otherwise provided shall be borne by the Contractor. All other expenditure required to be incurred for taking the samples, conveyance, packing etc. shall be borne by the contractor himself.
26. The contractor shall have to make approaches road to the site, if so required and keep them in good condition for transportation of labour and materials as well as inspection of works by the Engineer-in-charge. Nothing extra shall be paid on this account.
27. No payment shall be made for any damage caused by rain, snowfall, flood or any other natural calamity, whatsoever during the execution of the work. The contractor shall be fully responsible for any damage to the govt. property and work for which the payment has been advanced to him under the contract and he shall make good the same at his risk and cost. The contractor shall be fully responsible for safety and security of his material, T&P, Machinery brought to the site by him.
28. The terms machine batched, machine mixed and machine vibrated concrete used elsewhere in agreement shall mean the concrete produced in concrete batching and mixing plant and if necessary transported by transit concrete mixers, placed in position by the concrete pumps, tower crane and vibrated by surface vibrator /needle vibrator / plate vibrator, as the case may be to achieve required strength and durability.
29. Wherever work is specified to be done or material procured through specialized agencies, their names shall be got approved well in advance from Engineer in charge. Failure to do so shall not justify delay in execution of work. It is suggested that immediately after award of work, contractor should negotiate with concerned specialist agencies and send their names for approval to Engineer in charge. Any material procured without prior approval of Engineer in charge in writing is liable to be rejected. Engineer in charge reserves right to get the materials tested in laboratories of his choice before final acceptance.
30. The construction joints shall be provided in predetermined locations only as decided by Engineer in charge. The cost of shuttering for these construction joints shall be included in item of Concrete work / RCC work and nothing extra shall be payable on this account to the contractor.
31. The gradation of fine sand to be used in plaster work, shall be strictly as per standard specification. The plastered surface shall be fairly smooth without any undulation of any kind for applying paint/white wash.
32. No chase cutting/dismantling of plaster/RCC/CC shall be allowed, so contractor has to execute the electrical work accordingly.

33. The contractor shall invariably prepare the samples of finishing items i.e. flooring of different types, external & internal finishing i/c colour scheme of paint, tiles in dado, flooring in platforms & staircase, water supply & sanitary fittings and any other item as per direction of Engineer-in-charge. The contractor shall proceed with further finishing items only after getting the samples of these items approved in writing from Engineer-in-charge. In case of construction of residential quarters, one sample quarter complete in all shape for each category, shall be prepared by the contractor and got approved from Engineer-in-charge in writing. The contractor shall be allowed to proceed with further quarters only after getting the sample quarters approved in writing from Engineer-in-charge No extra claim whatsoever beyond the payments due at agreement rates will be entertained from the contractor on this account.

34. The contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case, he or his authorized representative is not present or does not associate himself, the results or such tests and consequences thereon shall be binding on the contractor.

35. The material shall conform to the quality and make as per tender. However for the items not appearing in the list preference shall be given to those articles which bear ISI certification marks. In case articles bearing ISI certification marks are not available the quality of sample brought by the Contractor shall be judged by the standard laid down in the relevant ISI specification/CPWD specification. All materials and articles brought by the contractor to the site for use shall conform to the samples approved, which shall be preserved till the completion of the work. However, such articles which bear ISI mark but stand banned by CPWD will not be used. Notwithstanding the case of materials of "Preferred Make" as given provisions of Clause 10A of the General Conditions of Contract for Central PWD works shall be applicable on the materials of "Preferred Make" also.

36. It must be ensure that all materials to be used in work bear BIS certification mark. In cases where BIS certification system is available for a particular material/product but not even a single producer has so far approached BIS for certification the material can be used subject to the condition that it should confirm to CPWD specification and relevant BIS codes. In such case written approval of the Engineer-In-Charge may be obtained before use of such material in the work.

37. The final approval of the brand to be used shall be as per the direction of Engineer-in-Charge. The brand used shall be one of the brands in case specified in the list of preferred make / materials.

38. In case of non-availability of material of the brands specified in the list of approved materials an equivalent brand may be used after getting written approval of WAPCOS giving details to indicate that the brand proposed to be used is equivalent to the brands mentioned in the agreement.

39. **Special conditions for Cement**

The contractor shall procure **53 grade Ordinary Portland Cement** (conforming to IS : 8112), The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacture(s) which the tenderer proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufactures, given by the tenderer, fully or partially. The cement brought to the site for execution of work shall be in bags bearing manufacturer's name & ISI marking. Weight of cement in each bag shall be 50 kg. Samples of cement arranged by the contactor shall be taken by the Engineer- in-Charge and got tested in accordance with provisions of relevant BIS codes. In case the test results indicate that the cement arranged by the contractor does not conform to the relevant BIS codes, the same shall stand rejected and it shall be removed from the site by the contractor at his own cost within 7 days of written order from the Engineer-in-Charge to do so.

40. **Special Conditions for Steel:-**

The contractor shall procure TMT bars of Fe500/Fe500D grade (the grade to procured is to be specified and approved) from primary steel producers as per the list of approved makes or any other producer as approved by WAPCOS who are using **iron ore** as the basic raw material.

41. **Removal of rejected/sub-standard materials.**

The following procedure shall be followed for the removal of rejected/sub-standard materials from the site of work:

(i) Whenever any material brought by the contractor to the site of work is rejected, entry thereof should invariably be made in the Site Order Book under the signature of the Engineer-In-Charge, giving the approximate quantity of such materials.

(ii) As soon as the material is removed, a certificate to that effect shall be recorded by the Engineer-In-Charge against the original entry, giving, the date of removal and mode of removal, i.e., whether by truck, carts, or by manual labour.

(iii) When it is not possible for the Engineer-In-Charge to be present at the site of work at the time of actual removal of the rejected/sub-standard materials from the site, the required certificate should be recorded by the Authorized Representative of WAPCOS, and the Engineer-In-Charge should countersign the certificate recorded by the Authorized Representative.

42. In case of works where a ready mix concrete (RMC) is stipulated to be used from an approved source/manufacturer, cement register need not be maintained. However, the computerized dispatch slips that are sent with each dispatch of RMC shall be kept as record.

43. If the work is carried out in more than one shift or during night, no claim on this account shall be entertained. The contractor has to take permission from the police & local authorities etc. if required for work during night hours. No claim / hindrance on this account shall be considered if work is not allowed during night time.

44. Once the building is completed and the contractor shall be responsible to attend defect pointed out by WAPCOS and then hand over the building to the WAPCOS as well as Client/ Owner.

45. Contractor should hand over the warranty of the specialized items to the WAPCOS.

46. The contractor is required to deploy resources as per availability of site. However no claim will be entertained for idle labour, idle machinery, idle technical/no-technical staff, idle T&P etc.

47. ~~Contractor shall not divert any advance payments or part thereof for any work other than that needed for completion of the contracted work. All advance payments received as per terms of the contract (i.e. secured advance against materials brought at site, secured advance against plant & machinery and/or for work done during interim stages, etc.) are required to be re-invested in the contracted work to ensure advance availability of resources in terms of materials, labour, plant & machinery needed for required pace of progress for timely completion of work~~.

48. In case of any inconsistency between clauses, the clause favorable/ beneficiary to the project will prevail which will be decided by the owner and WAPCOS.

49. The cost of providing the Defect Liability Service stated in the of this clause are to be borne by the contractor and shall be deemed to be included in the percentage rate quoted by the contractor.

50. Labour will not be allowed to stay in campus during night except watchman & his family only.

SECTION – V
ANNEXURES

SECTION – V : ANNEXURES

ANNEXURE - I : FORMAT FOR PERFORMANCE SECURITY

ANNEXURE - II : FORMAT FOR ADVANCE PAYMENT BANK GUARANTEE

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ANNEXURE- XIII : BANK GUARANTEE FORMAT FOR EMD

Annexure – I

FORM OF PERFORMANCE GUARANTEE (UNCONDITIONAL)

To,
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421

In consideration of _____ (Employer's name) (hereinafter referred to as "the Employer") which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to _____ (Contractor's name & address) (hereinafter referred to as "the Contractor" which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) a contract, by issue of Employer's Notification of Award No. _____ dt. _____ and the same having been unequivocally accepted by the Contractor, resulting into a contract valued at Rs. _____ (Rupees _____only) for _____(name of work) (hereinafter called "the contract") and the Contractor having agreed to provide a Contract Performance Guarantee for the faithful performance of the entire contract equivalent to Rs. _____ (Rupees _____only) (5 % of the said value of the Contract to the Employer).

We, _____ (name & address of bank) (hereinafter referred to as "the Bank" which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer, on demand any or, all monies payable by the Contractor to the extent of Rs. _____ (Rupees _____only) as aforesaid at any time up to _____ without any demur, reservation, contest , recourse or protest and/or without any reference to the Contractor or court. Any such demand made by the Employer on the bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Employer and further agrees that the guarantee herein contained shall continue to be enforceable till the Employer discharges this guarantee.

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 Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said contract have been fully paid and its claims satisfied or discharged or till the Employer certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said Contractor and accordingly discharges the guarantee.

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from, time to time to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other

matter or thing whatsoever which under law would but for this provision, have the effect of relieving the Bank. The guarantee shall not be affected by a change in the constitution of the bank or of the employer. The bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance, without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

We the Said Bank do hereby declare that we have absolute and unconditional power to issue this guarantee in your favour under the Memorandum and Articles of Association or such other constitutional documents of the Bank and the undersigned have full power to execute this guarantee under the Power of Attorney / Post Approval Authorization dated _____ of the bank granted to him / us by the Bank. We the said bank do hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the powers of the bank or its officials and the guarantee shall be deemed to have been issued as if the bank and its officials have all the powers and authorization to give this guarantee on behalf of the bank.

We the said bank do hereby certify the genuineness and appropriateness of the Stamp paper and stamp value used for issuing the guarantee. We the said bank do hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the stamp paper or its stamp value.

We the said bank do hereby declare that our payments hereunder shall be made to you , free and clear of and without and deduction, reduction on account of any reasons including any and all present and future taxes, levies, charges of withholding whatsoever imposed or collected with respect thereto.

Notwithstanding anything contained hereinabove our liability under this guarantee is restricted to Rs. _____(Rupees _____ only) and it shall remain in force up to and including _____ and shall be extended from time to time for such period as may be desired by M/s WAPCOS Limited to whom this bank guarantee has been given.

Notwithstanding anything contained herein

i) Our liability under this guarantee shall not exceed Rs. _____ (Rupees_____ only);
ii) This bank guarantee shall be valid upto _____; and
iii) our liability to make payment shall arise and we are liable to pay the guaranteed amount or any part thereof under this guarantee, only and only if you serve upon us a written claim or demand in terms of the guarantee on or before _____ (indicate a date twelve month after validity of Guarantee)

Dated this _____day of _____ at New Delhi.

Annexure – II
FORM OF ADVANCE BANK GUARANTEE (unconditional)

To,
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road, Kudasan,
Dist. Gandhinagar, Gujarat-382421

In consideration of WAPCOS LTD. (hereinafter referred to as "the Employer") which expression shall, unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to _____ (Contractor's name) with its Registered / Head Office at _____(hereinafter referred to as "the Contractor" which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) a contract, by issue of Employer's Notification of Award No. _____ dt. _____ and the same having been unequivocally accepted by the Contractor, resulting into a contract valued at Rs._____ (Rupees_____only) for _____ (hereinafter called "the contract") and the Employer having agreed to make an advance payment to the Contractor for performance of the above Contract amounting to Rs. _____ (Rupees _____only) as an advance against bank guarantee to be furnished by the Contractor.
We, _____ (name & address of bank) having its Head Office at _____ (hereinafter referred to as "the Bank" which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Employer immediately on demand any or, all monies payable by the Contractor to the extent of Rs. _____ (Rupees _____only) as aforesaid at any time up to _____ without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the Employer on the bank shall be conclusive and binding notwithstanding any difference between the Employer and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other authority. We agree that the Guarantee herein contained shall be irrevocable and shall continue to be enforceable till the Employer discharges this guarantee. We further agree that no change in the constitution of the Bank or of the Employer shall affect this guarantee.

The Employer shall have the fullest liberty without affecting in any way the liability of the Bank under this guarantee, from time to time, to vary the advance or to extend the time for performance of the Contract by the Contractor. The Employer shall have the fullest liberty without affecting this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner, and either to enforce or to forbear to enforce any covenants, contained or implied, in the Contract between the Employer and the Contractor or any other course or remedy or security available to the Employer. The bank shall not be released of its obligations under these presents by any exercise by the Employer of its liberty with reference to the matters aforesaid or any of them or by reason of any other act or forbearance or other acts of omission or commission on the part of the Employer or any other indulgence shown by the Employer or by any other matter or thing whatsoever which under law would but for this provision, have the effect of relieving the Bank.

The bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and

notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.
We the Said Bank do hereby declare that we have absolute and unconditional power to issue this guarantee in your favour under the Memorandum and Articles of Association or such other constitutional documents of the Bank and the undersigned have full power to execute this guarantee under the Power of Attorney/ Post Approval Authorization dated _____ of the bank granted to him / us by the Bank. We the said bank do hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the powers of the bank or its officials and the guarantee shall be deemed to have been issued as if the bank and its officials have all the powers and authorization to give this guarantee on behalf of the bank.

We the said bank does hereby certify the genuineness and appropriateness of the Stamp paper and stamp value used for issuing the guarantee. We the said bank does hereby declare and undertake that your claim under the guarantee shall not be affected by any deficiency or other defect in the stamp paper or its stamp value.

We the said bank do hereby declare that our payments hereunder shall be made to you , free and clear of and without and deduction, reduction on account of any reasons including any and all present and future taxes, levies, charges of withholding whatsoever imposed or collected with respect thereto.

Notwithstanding anything contained hereinabove our liability under this guarantee is limited to Rs._____ (Rupees _____ only) and it shall remain in force upto and including _____ and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s _____ on whose behalf this bank guarantee has been given.

Notwithstanding anything contained herein

i) Our liability under this guarantee shall not exceed Rs._____(Rupees _____only);
ii) This bank guarantee shall be valid upto _____ and
iii) Our liability to make payment shall arise and we are liable to pay the guaranteed amount or any part thereof under this guarantee, only and only if you serve upon us a written claim or demand in terms of the guarantee on or before _____ (indicate a date twelve months after the validity of the guarantee).

Dated this _____ day of _____ at New Delhi.

WITNESS

_____ _____
(Signature) (Signature)

_____ _____
(Name) (Name)

_____ _____
(Official address) (Designation with bank stamp)

_____ Attorney as Power of Attorney
(Signature) No._____ dt._____

_____
(Name)

_____

ANNEXURE-III

FORMAT FOR INDENTURE FOR SECURED ADVANCES

THIS INDENTURE made the…… day of ……20……. BETWEEN …… (hereinafter called the Contractor which expression shall where the context so admits or implies be deemed to include his executors administrators and assigns) of the one part and the WAPCOS (hereinafter called the WAPCOS which expression shall where the context so admits or implies be deemed to include his successors in office and assigns) of the other part.

WHEREAS by an agreement dated…….. (hereinafter called the said agreement) the Contractor has agreed AND WHEREAS the Contractor has applied to the WAPCOS that he may be allowed advances on the security of materials absolutely belonging to him and brought by him to the site of the works the subject of the said agreement for use in the construction of such of the works as he has undertaken to execute at rates fixed for the finished work (inclusive of the cost of materials and labour and other charges) AND WHEREAS the WAPCOS has agreed to advance to the Contractor the sum of Rupees …… on the security of materials the quantities and other particulars of which are detailed in Accounts of Secured Advances attached to the Running Account Bill for the said works signed by the Contractor on ……and the WAPCOS has reserved to himself the option of making any further advance or advances on the security of other materials brought by the Contractor to the site of the said works. Now THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees ……on or before the execution of these presents paid to the Contractor by the WAPCOS (the receipt whereof the Contractor doth hereby acknowledge) and of such further advances (if any) as may be made to him as aforesaid the Contractor doth hereby covenant and agree with the WAPCOS and declare as follows: -

(1) That the said sum of Rupees ……..so advanced by the WAPCOS to the Contractor as aforesaid and all or any further sum or sums advanced as aforesaid shall be employed by the Contractor in or towards expediting the execution of the said works and for no other purpose whatsoever.

(2) That the materials detailed in the said Account of Secured Advances which have been offered to and accepted by the WAPCOS as security are absolutely the Contractor's own property and free from encumbrances of any kind and the contractor will not make any application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the Contractor indemnifies the WAPCOS against all claims to any materials in respect of which an advance has been made to him as aforesaid.

(3) That the materials detailed in the said Account of Secured Advances and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereinafter called the said materials) shall be used by the Contractor solely in the execution of the said works in accordance with the directions of the Divisional Officer …… Division (hereinafter called the Divisional Officer) and in the term of the said agreement.

(4) That the Contractor shall make at his own cost all necessary and adequate arrangements for the proper watch, safe custody and protection against all risks of the said materials and that until used in construction as aforesaid the said materials shall remain at the site of the said works in the Contractor's custody and on his own responsibility and shall at all times be open to inspection by the Divisional Officer or any officer authorized by him. In the event of the said materials or any part thereof being stolen, destroyed or damaged or becoming deteriorated in a greater degree than is due to reasonable use and wear thereof the Contractor will forthwith replace the same with other materials of like quality or repair and make good the same as required by the Divisional Officer.

(5) That the said materials shall not on any account be removed from the site of the said works except with the written permission of the Divisional Officer or an officer authorized by him on that behalf.

(6) That the advances shall be repayable in full when or before the Contractor receives payment from the WAPCOS of the price payable to him for the said works under the terms and provisions of the said agreement. Provided that if any intermediate payments are made to the Contractor on account of work done than on the occasion of each such payment the WAPCOS will be at liberty to make a recovery from the Contractor's bill for such payment by deducting there from the value of the said

materials then actually used in the construction and in respect of which recovery has not been made previously, the value for this purpose being determined in respect of each description of materials at the rates at which the amounts of the advances made under these presents were calculated.

(7) That if the Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing to the WAPCOS shall immediately on the happening of such default be repayable by the Contractor to the WAPCOS together with interest thereon at twelve per cent per annum from the date or respective dates of such advance or advances to the date of repayment and with all costs charges, damages and expenses incurred by the WAPCOS in or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractor and the Contractor hereby covenants and agrees with the WAPCOS to repay and pay the same respectively to him accordingly.

(8) That the Contractor hereby charges all the said materials with the repayment to the WAPCOS of the said sum of Rupees ……and any further sum or sums advanced as aforesaid and all costs charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding anything in the said agreement and without prejudice to the powers contained therein if and whenever the covenant for payment and repayment herein before contained shall becomeenforceable and the money owing shall not be paid in accordance therewith the WAPCOS may at any time thereafter adopt all or any of the following courses as he may deem best :-

(a) Size and utilize the said materials or any part thereof in the completion of the said works on behalf of the Contractor in accordance with the provisions in that behalf contained in the said agreement debiting the Contractor with the actual cost of effecting such completion and the amount due in respect of advances under these presents and crediting the Contractor with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the Contractor he is to pay same to the WAPCOS on demand.

b) Remove and sell by public auction the seized materials or any part thereof and out of the moneys arising from the sale retain all the sums aforesaid repayable or payable to the WAPCOS under these presents and pay over the surplus (if any) to the Contractor.

(c) Deduct all or any part of the moneys owing out of the security deposit or any sum due to the Contractor under the said agreement.

(9) That except in the event of such default on the part of the Contractor as aforesaid interest on the said advance shall not be payable.

(10) That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevail and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been herein before expressly provided for the same shall be finally resolved as per provisions of clause 25 of the contract.

In witness whereof the said ……and ……by the order and under the direction of the WAPCOS have hereunto set their respective hands the day and year first above written.

Signed, sealed and delivered by……the said contractor in the presence of ……

Signature ……

Witness Name……

Address ……

Signed by……

by the order and direction of the WAPCOS in the presence of

Witness Name……

Address ……

Signed by……

ANNEXURE-IV
FORMAT FOR SEEKING EXTENSION OF TIME
(To be submitted on Contractor's original Letter Head)

1. Name of Contractor:
2. Name of work:
3. Agreement No. and Date:
4. Date of commencement of work as per Agreement:
5. Period and Stipulated date of completion as per Agreement:
6. Period for which extension of time already given:

Extension	Period	Reasons Stated earlier for seeking EoT
(a) 1st extension		
(b) 2nd extension		
(c) 3rd extension		
(d) 4th extension		
(e) 5th extension		

9) Reasons for present extension

10) Period for which extension is applied for

It is understood that we will not claim any additional cost due to above extension of time and also understand that WAPCOS have rights to act in accordance with provisions in relevant clauses of Contract Agreement.

Dated……..

Contractor's Signature and Stamp

Annexure – V
FORMAT FOR GUARANTE BONDS / AFFIDAVTI FOR WORK - UNCONDITIONAL
(On Rs. 300 non- Judicial Stamp Paper)
GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER SUPPLY AND SANITARY INSTALLATIONS, ROCK WOOL INSULATION AND POLYURETHENE FOAM

The agreement made this ____ day of _____ 20 _____ between (Name of Contractor Firm) _____ (hereinafter called the GUARANTOR of the one part) and the WAPCOS LIMITED (hereinafter called the WAPCOS of the other part).

WHEREAS THIS agreement is supplementary to a contract. (Herein after called the Contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the WAPCOS of the other part, whereby the contractor interalia, under look to render the work in the said contract recited structurally stable workmanship and use of sound materials.

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

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable, for the minimum life of ten years, to be reckoned from the date of start of Defect Liability Period prescribed in the Contract.

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

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

IN WITHNES WHEREOF those presents have been executed by the GUARANTOR _____on behalf of (Name of Contractor Firm) and _____ by for and on behalf of the WAPCOS LIMITED on the day, month and year first above written.

Signed sealed and delivered by GUARANTOR in presence of :
1. _____
2. _____
SIGNED FOR AND ON BEHALF OF THE WAPCOS LIMITED BY_____ _____ in the presence of:
1. _____
2. _____

Annexure – VI
FORMAT FOR GUARANTE BONDS FOR WATER PROOFING - UNCONDITIONAL
(On Rs. 300 non- Judicial Stamp Paper) Unconditional
GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR WATER PROOFING TREATMENT FOR BASEMENT / TERRACE / TOILETS

The agreement made this ____ day of _____ 20 _____ between (Name of Contractor Firm) _____ (hereinafter called the GUARANTOR of the one part) and the WAPCOS LIMITED (hereinafter called the WAPCOS of the other part).

WHEREAS THIS agreement is supplementary to a contract. (Herein after called the Contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the WAPCOS of the other part, whereby the contractor interalia, undertook to render the structures in the said contract the work in the said contract recited completely water and leak proof.

THE GUARANTOR hereby guarantee that the water proofing treatment for the existing building under the contract, executed by Guarantor will render the structures completely leak proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date of start of Defect Liability Period prescribed in the Contract.

Guarantor also certified that work of water proofing during up-gradation / renovation of existing building under this contract has been done through Authorized Applicator of Specialized Renowned Waterproofing Agency (SIKA/ FOSROC/ BASF) for water proofing works and understood that there will be no problem of seepage in future up to 05 years.

Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects. The decision of the Engineer in charge with regard to cause of leakage shall be final.

During the period of guarantee the guarantor shall make good all defects and in case of any defects being found render the structure 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 the WAPCOS through some other contractor at the guarantor's cost and risk. The decision of the Engineer in charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the water proofing, or commits breach thereunder then the guarantor will indemnify the Principal and his successor against all loss, damage, cost of expenses or otherwise which may be incurred by him by reason of any 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 cost incurred by the WAPCOS on the decision of the Engineer-in-charge will be final and binding on the parties.

IN WITHNES WHEREOF those presents have been executed by the GUARANTOR _____on behalf of (Name of Contractor Firm) and _____ by for and on behalf of the WAPCOS LIMITED on the day, month and year first above written.

Signed sealed and delivered by GUARANTOR in presence of:
1. _____
2. _____
SIGNED FOR AND ON BEHALF OF THE WAPCOS LIMITED BY_____ in the presence of:
1. _____
2. _____

Annexure – VII
FORMAT FOR GUARANTE BONDS FOR ANTI-TERMITE TREATMENT - UNCONDITIONAL
(On Rs. 300 non- Judicial Stamp Paper)
GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR ANTI-TERMITE TREATMENT

The agreement made this ____ day of _____ 20 _____ between (Name of Contractor Firm) _____ (hereinafter called the GUARANTOR of the one part) and the WAPCOS LIMITED (hereinafter called the WAPCOS of the other part).

WHEREAS THIS agreement is supplementary to a contract. (Herein after called the Contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the WAPCOS of the other part, whereby the contractor inter alia, undertook to render the wooden work in the said contract recited completely Termite proof.

THE GUARANTOR hereby guarantee that the anti-termite treatment given by him will render the wooden works completely Termite proof and the minimum life of such Anti-Termite treatment shall be five years to be reckoned from the date completion of work as period prescribed in the contract.

During the period of guarantee the guarantor shall make good all defects and in case of any defects being found render the wooden works termite 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 the WAPCOS through some other contractor at the guarantor's cost and risk. The decision of the Engineer in charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the Anti-termite works, or commits breach thereunder then the guarantor will indemnify the Principal and his successor against all loss, damage, cost of expenses or otherwise which may be incurred by him by reason of any 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 cost incurred by the WAPCOS on the decision of the Engineer-in-charge will be final and binding on the parties.

IN WITHNES WHEREOF those presents have been executed by the GUARANTOR _____on behalf of (Name of Contractor Firm) and _____ by for and on behalf of the WAPCOS LIMITED on the day, month and year first above written.

Signed sealed and delivered by GUARANTOR in presence of:
1. _____
2. _____

SIGNED FOR AND ON BEHALF OF THE WAPCOS LIMITED BY_____ in the presence of:
1. _____
2. _____

ANNEXURE – VIII
SAFETY CODES

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than ¼ to 1(¼ horizontal and 1 vertical).
2. Scaffolding of staging more than 3.6 m (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends 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. Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.
4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm. (3ft.).
5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11½") for ladder upto and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least ¼" for each additional 30 cm. (1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit; action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.
6. (a) Excavation and Trenching - All trenches 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30 m. (100ft.) in length or fraction thereof, Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5 m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. (5ft.) 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.

   (b) Safety Measures for digging bore holes:-

   I. If the bore well is successful, it should be safely capped to avoid caving and collapse of the bore well. The failed and the abandoned ones should be completely refilled to avoid caving and collapse;
   II. During drilling, Sign boards should be erected near the site with the address of the drilling contractor and the Engineer in-charge of the work;
   III. Suitable fencing should be erected around the well during the drilling and after the installation of the rig on the point of drilling, flags shall be put 50m all-round the point of drilling to avoid entry of people;

IV. After drilling the bore well, a cement platform (0.50m x 0.50m x 1.20m) 0.60m above ground level and 0.60m below ground level should be constructed around the well casing;

V. After the completion of the bore well, the contractor should cap the bore well properly by welding steel plate, cover the bore well with the drilled wet soil and fix thorny shrubs over the soil. This should be done even while repairing the pump;

VI. After the bore well is drilled the entire site should be brought to the ground level.

7. Demolition - Before any demolition work is commenced and also during the progress of the work,

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

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

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

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

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

II. Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes, shall be provided with protective goggles.

III. Those engaged in welding works shall be provided with welder's protective eye shields.

IV. Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

V. 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 to the public. In addition, the contractor shall ensure that the following safety measure 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 downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manhole 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 of 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 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 stop 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.

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 precaution should be taken:-

(a) No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
(b) Suitable face masks 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.
(c) Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.

9. The Contractor shall not employ women and men below the age of 18 on the work of painting with product containing lead in any form, wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use :

I. White lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.
II. Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.
III. Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.
IV. Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
V. Overall shall be worn by working painters during the whole of working period.
VI. Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.
VII. Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man.
VIII. WAPCOS may require, when necessary medical examination of workers.
IX. Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

10. When the work is done near any place where there is risk of drowning, all necessary equipment's should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.
11. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions :-
    I. (a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.
    II. (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.
    III. 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 give signals to operator.
    IV. 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 condition 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.
    V. In case of departmental machines, the safe working load shall be notified by the Electrical Engineer-in-Charge. As regards contractor's machines the contractors 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 it verified by the Electrical Engineer concerned.
12. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting 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 to 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 should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.
13. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.
14. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.
15. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labour Officer or Engineer-in-Charge of the department or their representatives.
16. Notwithstanding the above clauses from (1) to (15), there is nothing in these to EMD to the contractor from the operations of any other Act or Rule in force in the Republic of India.

ANNEXURE – IX
MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY CONTRACTORS

1. APPLICATION

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

2. **DEFINITION**

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

3. FIRST-AID FACILITIES

(i) At every work place, there 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 for 150 contract labour or part thereof ordinarily employed.

(ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment:-

(a) For work places in which the number of contract labour employed does not exceed 50- Each first-aid box shall contain the following equipment's :-

1) 6 small sterilized dressings.
2) Medium size sterilized dressings.
3) Large size sterilized dressings.
4) Large sterilized burn dressings.
5) 1 (30 ml.) bottle containing a two per cent alcoholic solution of iodine.
6) 1 (30 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
7) 1 snakebite lancet.
8) 1 (30 gms.) bottle of potassium permanganate crystals.
9) 1 pair scissors.
10) 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
11) 1 bottle containing 100 tablets (each of 5 gms.) of aspirin.
12) Ointment for burns.
13) A bottle of suitable surgical antiseptic solution

(b) For work places in which the number of contract labour exceed 50. Each first-aid box shall contain the following equipment's.

1) 12 small sterilized dressings.
2) 6 medium size sterilized dressings.
3) 6 large size sterilized dressings.
4) 6 large size sterilized burn dressings.
5) 6 (15 gms.) packets sterilized cotton wool.
6) 6.1 (60 ml.) bottle containing a two per cent alcoholic solution iodine.
7) 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label
8) 1 roll of adhesive plaster.
9) 1 snake bite lancet.
10) 1 (30 gms.) bottle of potassium permanganate crystals.
11) 1 pair scissors.
12) 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institutes / Government of India.
13) A bottle containing 100 tablets (each of 5 gms.) of aspirin.

14) Ointment for burns.
15) A bottle of suitable surgical antiseptic solution.

(iii) Adequate arrangements shall be made for immediate recoupment of the equipment when necessary
(iv) Nothing except the prescribed contents shall be kept in the First-aid box.
(v) 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.
(vi) A person in charge of the First-aid box shall be a person trained in First-aid treatment in the work places where the number of contract labour employed is 150 or more.
(vii) In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from 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.
(viii) Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

4. DRINKING WATER

(i) 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.
(ii) 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.
(iii) Every water supply or storage shall be at a distance of not less than 50 feet from any latrine 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.
(iv) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHING FACILITIES

(i) In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of contract labour employed therein.
(ii) Separate and adequate cleaning facilities shall be provided for the use of male and female workers.
(iii) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

6. LATRINES AND URINALS

(i) Latrines shall be provided in every work place on the following scale namely :-
   a. Where female 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 upto the first 100, and one for every 50 thereafter.

(ii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
(iii) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside at least once a year, Latrines shall not be of a standard lower than borehole system.

(iv) (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 a man or of a woman, as the case may be.

(v) There shall be at least one urinal for male workers upto 50 and one for female workers upto fifty 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 upto the first 500 and one for every 100 or part thereafter.

(vi) (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 sewage system shall comply with the requirements of the Public Health Authorities.

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

(viii) 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. Alternately excreta may be disposed of 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 refuse and then covering it with a layer of earth for a fortnight (when it will turn to manure).

(ix) The contractor shall at his own expense, carry out all instructions 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 on his behalf.

7. PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 meters (10 ft.) 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 (6 sft) per head.
Provided that the Engineer-in-Charge may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8. **CRECHES**

(i) At every work place, at which 20 or more women worker 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 play room for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause 19H (ii) a,b & c.

(ii) 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.

(iii) The contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the bed room.

(iv) 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.

(v) The use of the rooms earmarked as creches shall be restricted to children, their attendants and mothers of the children.

9. CANTEENS

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

(ii) The canteen shall be maintained by the contractor in an efficient manner.

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

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

(v) The floor shall be made of smooth and impervious materials 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.

(vi) The premises of the canteen shall be maintained in a clean and sanitary condition.

(vii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.

(viii) Suitable arrangements shall be made for the collection and disposal of garbage.

(ix) The dining hall shall accommodate at a time 30 per cent of the contract labour working at a time.

(x) 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 (10 sft) per diner to be accommodated as prescribed in sub-Rule 9.

(xi) (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.

(xii) Sufficient tables stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule 9.

(xiii) (a) 1.There shall be provided and maintained sufficient utensils crockery, furniture and any other equipment's necessary for the efficient running of the canteen.
2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.
(b)1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.
2. A service counter, if provided, shall have top of smooth and impervious material.
3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment's.

(xiv) The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.

(xv) The charges for food stuffs, 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.

(xvi) In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken into consideration as expenditure namely:-
(a) The rent of land and building.
(b) The depreciation and maintenance charges for the building and equipment provided for the canteen.
(c) The cost of purchase, repairs 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 of equipment provided for the canteen.

(xvii) The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

10. 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. The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts.

12. AMENDMENTS

Government may, from time to time, add to or amend these rules and issue directions - it may consider necessary for the purpose of removing any difficulty which may arise in the administration thereof.

ANNEXURE-X

Contractor's Labour Regulations

1. SHORT TITLE

These regulations may be called the C.P.W.D./PWD/R&B(Panchamahal) Contractors Labour Regulations/ Govt. of Gujarat.

2. DEFINITIONS

(i) Workman means any person employed by C.P.W.D./PWD/R&B (DA)/ or its contractor directly or indirectly through a subcontractor with or without the knowledge of the Central Public Works Department/PWD/R&B (DA) to do any skilled, semiskilled or 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 five hundred rupees per mensem or exercises either by the nature of the duties attached to the office or by reason of powers vested in him, functions mainly of managerial nature: or

(c) Who is an out worker, that is to say, person to whom any article or materials are given out by or on behalf of the principal employers 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 employers 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.

No person below the age of 14 years shall be employed to act as a workman.

(ii) Fair Wages means wages whether for time or piece work fixed and notified under the provisions of the Minimum Wages Act from time to time.

(iii) Contractors shall include every person who undertakes to produce a given result other than a mere supply of goods or articles of manufacture through contract labour or who supplies contract labour for any work and includes a subcontractor.

(iv) Wages shall have the same meaning as defined in the Payment of Wages Act.

3. (i) 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.

(ii) 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 over time for the extra hours put in by him at double the ordinary rate of wages.

(iii) (a) Every worker shall be given a weekly holiday normally 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.

(b) Where 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.

(c) 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 substituted holiday to him for the whole day on one of the five days immediately before or after the normal weekly holiday and pay wages to such worker for the work performed on the normal weekly holiday at overtime rate.

4. 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 clear 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 Minimum Wages Act, the actual wages being paid, the hours of work for which such wage are earned, wages periods, dates of payments of wages and other relevant information as per Appendix 'III'.

5. PAYMENT OF WAGES

(i) The contractor shall fix wage periods in respect of which wages shall be payable. (ii) No wage period shall exceed one month.

(ii) The wages of every person employed as contract labour in an establishment or by a contractor where less than one thousand such persons are employed shall be paid before the expiry of 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.

(iii) 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.

(iv) All payment 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.

(v) Wages due to every worker shall be paid to him direct by contractor through Bank or ECS or online transfer to his bank account.

(vi) All wages shall be paid through Bank or ECS or online transfer.

(vii) 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.

(viii) A notice showing the wages 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.

(ix) It shall be the duty of the contractor to ensure the disbursement of wages through bank account of labour.

(x) The contractor shall obtain from the Junior 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:-

(xi) "Certified that the amount shown in column No ..... has been paid to the workman concerned through bank account of labour on ..... at……"

6. FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES

(i) 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 person for custody or for 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 overpayment of wages, advances granted shall be entered in a register.

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

(ii) No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved of by the Chief Labour Commissioner.

Note:- An approved list of Acts and Omissions for which fines can be imposed is enclosed at Appendix-X

(iii) 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.

(iv) 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.

(v) No fine imposed on any worker shall be recovered from him by instalment, or after the expiry of sixty days from the date on which it was imposed.

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

7. LABOUR RECORDS

(i) 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 IV)

(ii) The contractor shall maintain a Muster Roll register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix V).

(iii) The contractor shall maintain a Wage Register in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VI).

(iv) Register of accident - 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 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

(v) The contractor shall maintain a Register of Fines in the Form XII of the CL (R&A) Rules 1971 (Appendix-XI) The contractor shall display in a good condition and in a conspicuous place of work the approved list of acts and omissions for which fines can be imposed (Appendix-X)

(vi) The contractor shall maintain a Register of deductions for damage or loss in Form XX of the CL (R&A) Rules 1971 (Appendix-XII)

(vii) The contractor shall maintain a Register of Advances in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIII)

(viii) The contractor shall maintain a Register of Overtime in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIV)

6. ATTENDANCE CARD-CUM-WAGE SLIP

(i) The contractor shall issue an Attendance card-cum-wage slip to each workman employed by him in the specimen form at (Appendix-VII)

(ii) The card shall be valid for each wage period.

(iii) 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.

(iv) The card shall remain in possession of the worker during the wage period under reference.

(v) 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.

(vi) The contractor shall obtain the signature or thumb impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

9. EMPLOYMENT CARD

The contractor shall issue an Employment Card in Form XIV of the CL (R&A) Central Rules 1971 to each worker within three days of the employment of the worker (Appendix-VIII).

10. 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 Form XV of the CL (R&A) Central Rules 1971 (Appendix-IX)

11. PRESERVATION OF LABOUR RECORDS

All records required to be maintained under Regulations Nos. 6 & 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 or Labour Officer or any other officers authorised by the Ministry of Urban Development in this behalf.

12. POWER OF LABOUR OFFICER TO MAKE INVESTIGATIONS OR ENQUIRY

The Labour Officer or any person authorised by Central Government on their behalf shall have power to make enquires with a view to ascertaining and enforcing due and proper observance of Fair Wage Clauses and the Provisions of these Regulations. He shall investigate into any complaint regarding the default made by the contractor or subcontractor in regard to such provision.

13. REPORT OF LABOUR OFFICER

The Labour Officer or other persons authorised as aforesaid shall submit a report of result of his investigation or enquiry to the Engineer In-charge concerned indicating the extent, if any, to which the default has been committed with a note that necessary deductions from the contractor's bill be made and the wages and other dues be paid to the labourers concerned. In case an appeal is made by the contractor under Clause 13 of these regulations, actual payment to labourers will be made by the Engineer In-charge after the approval has given his decision on such appeal.

(i) The WAPCOS shall arrange payments to the labour concerned within 45 days from the receipt of the report form the Labour Officer as the case may be.

14. APPEAL AGAINST THE DECISION OF LABOUR OFFICER

Any person aggrieved by the decision and recommendations of the Labour Officer or other person so authorised may appeal against such decision to the Superintending Engineer concerned within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the Executive Engineer concerned but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

15. PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER

(i) A workman shall be entitled to be represented in any investigation or enquiry under these regulations by:-
   (a) An officer of a registered trade union of which he is a member.
   (b) An officer of a federation of trade unions to which the trade union referred to in clause (a) is affiliated.
   (c) Where the employer is not a member of any registered trade union, by an officer of a registered trade union, connected with the industry in which the worker is employed or by any other workman employed in the industry in which the worker is employed.

(ii) An employer shall be entitled to be represented in any investigation or enquiry under these regulations by :-
   (a) An officer of an association of employers of which he is a member.

(b) An officer of a federation of associations of employers to which association referred to in clause (a) is affiliated.

(c) Where the employers is not a member of any association of employers, by an officer of association of employer connected with the industry in which the employer is engaged or by any other employer, engaged in the industry in which the employer is engaged.

(iii) No party shall be entitled to be represented by a legal practitioner in any investigation or enquiry under these regulations.

16. INSPECTION OF BOOKS 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.

17. SUBMISSIONS OF RETURNS

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

18. AMENDMENTS

The Central Government may from time to time add to or amend the regulations and on any question as to the application/Interpretation or effect of those regulations the decision of the Superintending Engineer concerned shall be final.

NOTE: Appendix & others mentioned in above labour regulation from I to XIV will be as per the General Conditions of Contract-2020 – Construction works of CPWD.

~~**ANNEXURE-XI**~~

~~**Bid Security Declaration Unconditional**~~

~~**(To be submitted on Non-Judicial Stamp paper of minimum Rs. 300)**~~

DELETED

ANNEXURE- XII : CONTRACT AGREEMENT
(On Rs. 300/ Stamp Paper duly Notarized)

THIS AGREEMENT IS MADE on this.....day of_____2024 BETWEEN **M/s. WAPCOS Limited**, having its corporate office at **76-C, Sector-18, Gurgaon, Haryana – 122 015** represented by its_____ having_____his official address as_____(hereinafter referred to as the 'WAPCOS' or 'Client' or 'Employer' which expression shall, unless repugnant to the context or meaning thereof, includes its successors and assigns) of one part and **M/s**_____having its registered office at_____ represented by_____**(Name & designation of Authorized signatory)** (hereinafter referred to as 'Agency' or 'Contractor' which expression shall, unless repugnant to the context or meaning thereof, includes its successors, administrators, liquidators and assigns or legal representatives) of the other part.

WHEREAS the Client invited tender vide NIT No.:_____Dated_____for **"_____" (Name of Work)** and the agency submitted bids in response of the same giving rates/amounts accepting the terms and conditions of the NIT document.

AND WHEREAS the said bid submitted by the Contractor has been accepted and the Client has awarded the work of **"_____" (Name of Work)** vide work order No. _____and the Contractor submitted a signed copy of the work order as a token of acceptance giving rates/amounts accepting the terms and conditions as stipulated in the work order.

NOW THIS AGREEMENT WITNESSETH and the parties hereby agree as follows:

1.	The bid submitted by the Agency for the scope of services/work specified in the NIT and work order at the rates/amounts specified in consideration of all the terms and conditions in the NIT is accepted.		
2.	Agreement shall be valid for a period mentioned in the NIT and Work Order from the date of signing unless revoked earlier. Further extensions will be considered as per the provisions of work order and NIT.		
3.	The Agency agreed to abide by and fulfil all the terms and provisions of the said conditions of contract in default thereof forfeit and pay to WAPCOS the sum of money mentioned in the said conditions.		
4.	It is mutually agreed that the offer in its entirety shall form part of this agreement.		
5.	Contract Amount	:	Rs_____/- (Rupees in words) excluding/ includingGST and including all other Taxes.
6.	Performance Guarantee & Security Deposit	:	Rs._____/- (Rupees in words), i.e. 5% of Rs. _____ (Accepted contract price) is submitted by Irrevocable Bank Guarantee/Demand Draft valid upto 1 y e a r in addition to the duration of the work. Security Deposit shall be recovered at the rate of 2.5% of each running bill and final bill & 2.5% in the form of FDR. The security deposit will be refunded after satisfactory completion of the project in all respect and obtaining of completion certificate from the client department authority, if required. The Performance /Bank guarantee should be renewed/ extended in case the work gets extended.
7.	Project Completion Period	:	Contract-_____days (Duration of work) from the Date mentioned in the Letter of Award of Work for the said work.
8.	Billing and payment	:	Billing should be in the name of WAPCOS limited,

			_____ (Address)" bearing theGSTIN:_____ _____. The billing GST will beapplicable as per the GST slabs. The GST charged shall be reimbursed by WAPCOS limited on submission of followingdocuments (proof of GST paid and filing): 1) GSTR-1 2) GSTR-3 3) GST Challan. Each RA bill should be enclosed with certified measurement sheets in measurement book (MB) duly certified by Engineer in Charge and the requisite test reports from reputed and accredited institutes as per the relevant standards. WAPCOS shall make the payment on back to back basis of bills only after receipt of the payment from Client in following Bank Account: Name: Account No.: IFSC Code: Bank:
9.	Delay in completion	:	The aggregate maximum of liquidated damages payable under clause No.2 Shall not exceed 0.10 Percentage of contract value per day and shall be subject to the maximum amount of 10 percentage of the estimated amount put to tender
11.	Statutory Regulations	:	The Contractor is abide to follow all the prevailing statutory regulations with respect to the execution of work, safety, labour welfare, insurances etc. without any additional burden to WAPCOS

All other terms & conditions as mentioned in NIT document, Corrigendum / Addendum & other listedbelow documents shall also form part of the agreement:

1. Notice Inviting Tender (NIT) Document, Corrigendum / Addendum
2. Agency's Technical & Financial Bid Documents.
3. Work Order
4. Copy of Performance Security.

In witness whereof the parties thereto have caused this Agreement to be executed the day and year first before written at Surat.

For **M/s**_____ For **WAPCOS Limited**

Signature of the Agency
the Employer(with the seal of company and address)
seal of company and address)

Signature of
(with the

In the presence of witness:
1.
2.

In the presence of witness:
1.
2.

SECTION – VI
FORMS

SECTION – VI FORMS

LETTER OF TRANSMITTAL

FORM-A : STRUCTURE & ORGANISATION

FORM-B1 : FINANCIAL INFORMATION

FORM-B2 : FORM OF BANKERS' CERTIFICATE FROM A NATIONALIZED BANK

FORM C : NO CONVICTION CERTIFICATE

FORM D : UNDERSTANDING THE PROJECT SITE

FORM E : NO DEVIATION CERTIFICATE

FORM F : INTEGRITY PACT WITH INTEGRITY AGREEMENT

FORM G : FORMAT FOR LITIGATION HISTORY, LIQUIDATED DAMAGES, DISQUALIFICATION

FORM-H : UNDERTAKING FOR WATERPROOFING WORKS

LETTER OF TRANSMITTAL

(on Bidder **Original** *Letter Head)*

To
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421

Subject: Submission of bids for (Name of the Work/ Project)

Sir,

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

1. I/we hereby certify that all the statement made and information supplied in the "Forms "enclosed with the tender and accompanying statement are true and correct.
2. I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.
3. I/we submit the requisite certified solvency certificate and authorize the WAPCOS Ltd. to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/we also authorize WAPCOS Ltd. to approach individuals, employers, firms and corporation to verify our competence and general reputation.
4. I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible similar works:

Name of work	Certificate from

Certificate:

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

Enclosures:

Seal of bidder

Date of submission: Signature(s) of Bidder(s).

FORM- A
STRUCTURE & ORGANISATION

S.No.	Particulars	Details Submitted by Bidder
1.	Name & address of the bidder	
2.	Telephone no./ Telex no./ Fax no.	
3.	Legal status of the bidder (attach copies of original document defining the legal status) (a) A proprietary firm (b) A partnership firm (c) A limited company or Corporation (d) A Company registered under company's Act 1956/ 2013	
4.	Particulars of registration with various Government Bodies (attach attested photocopy)	
	Organization/ Place of Registration 1. 2. 3.	Registration No.
5.	Names and titles of Directors & Officers with designation to be concerned with this work.	
6.	Designation of individuals authorized to act for the organization	
7.	Has the bidder, or any constituent partner in case of partnership firm Limited Company/ Joint Venture, ever been convicted by the court of law? If so, give details.	
8.	In which field of Civil Engineering construction the bidder has specialization and interest?	
9.	Any other information considered necessary but not included above.	

Signature of Bidder(s)

FORM-B-1
FINANCIAL INFORMATION
[To be submitted on Original Letter Head of Bidder OR **Original** Letter Head of CA]

1. Financial Analysis: Details to be furnished duly supported by figures in balance sheet/ profit & loss account for the last five years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (Copies to be attached).

Years	Gross Annual turnover	Profit/Loss (After Tax)
2017-2018		
2018-2019		
2019-2020		
2020-2021		
2021-2022		
2022-2023		

Signature of Chartered Accountant/ statutory Auditor
(UDIN No.)
(with Seal)

FORM "B-2"
FORM OF BANKERS' CERTIFICATE FROM A NATIONALIZED BANK

Date:

To
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421.

Name of Work:-

This is to certify that to the best of our knowledge and information that M/s./ Sh ……..having marginally noted address, a customer of our bank are/is respectable and can be treated as good for any engagement upto a limit of Rs……. Rupees……..).

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

(Signature)
For the Bank

NOTE:
1. Banker's certificates should be on letter head of the Bank, sealed in cover addressed to tendering authority.
2. In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

FORM-C
FORMAT OF UNDERTAKING

[To be furnished on Company **Letter Head** with regard to Blacklisting/ Non- Debarment by Contractor Agency]

UNDERTAKING REGARDING BLACKLISTING / NON- DEBARMENT

Name of Work:

Ref.: Tender No……. Dated…….

To,

Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421

This is to certify that we have taken the cognizance of Blacklisting Policy of WAPCOS Ltd. Further, we hereby confirm and declare that we, M/s_____ is not Blacklisted/ No debarred by any Government Department/Public Sector Undertaking/Private Sector/ or any other agency for which we have Executed/ undertaken the works / Services during the last 5 years.

For_____

Yours faithfully,

Authorized Signatory
Date:

FORM-D

FORMAT FOR UDERSTANDING THE PROJECT SITE

[To be submitted on Bidder's **Original** Letter Head]

To
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421

Subject: Undertaking of the Site Visit for --- (Name of the work / project)

Sir,

I/we hereby certify that I/we have examined & inspected the site & its surrounding satisfactorily, where the project is to be executed as per the scope of works. I/ We are well aware about the following

- Location of work, its surrounding and accessibility to the site.
- Ground Water Level at construction site.
- Quality of ground water and availability of water surrounding to the Project.
- Termite effects at construction site & measures taken during construction of proposed site.
- Site clearance and location of matured trees.
- Topography and contouring of the land where the project is to be executed.
- Nature of the ground & sub-soil of the site as pile foundation is to be constructed
- Hindrances, if any, which may arise during the execution of work

I / We hereby submit our BID considering above all facts gathered during site visit and each & every aspect have been considered in the Quoted Rates / costs.

Yours faithfully,

Date:

Place:

(Signature, name and designation of the Authorized signatory)

Name and seal of Bidder

FORM-E

FORMAT FOR NO DEVIATION CERTIFICATE

[To be submitted on Bidder's **Original** Letter Head]

To,
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421

Subject: No Deviation Certificate for ------(name of Work /Project)

Dear Sir,

With reference to above this is to confirm that as per Tender conditions we have visited site before submission of our Offer and noted the job content and site condition etc. We also confirm that we have not changed/modified the above tender document and in case of observance of the same at any stage it shall be treated as null and void.

We hereby also confirm that we have not taken any deviation from Tender Clause together with other reference as enumerated in the above referred Notice Inviting Tender and we hereby convey our unconditional acceptance to all terms & conditions as stipulated in the Tender Document.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null and void.

Yours faithfully,

Date:

(Signature, name and designation of the Authorized signatory)

Place:

Name and seal of Bidder

FORM-F
FORMAT FOR INTEGRITY PACT
UNCONDITIONAL
[To be submitted on Bidder's **Original** Letter Head]

To,
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421
Sub: Integrity Pact for ------(Name of Work / Project)

Dear Sir,
I/We acknowledge that WAPCOS is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document at **Enclosure-II.**

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

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

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

Yours faithfully,

Date: (Signature, name and designation of the Authorized signatory)

Place: **Name and seal of Bidder**

Enclosure-II
INTEGRITY AGREEMENT UNCONDITIONAL
[Will be submitted on Stamp paper of At least Rs.300]

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

BETWEEN

WAPCOS Limited, New Delhi (Hereinafter referred as the **'Principal/Owner',** which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....
(Name and Address of the Individual/firm/Company)
Through..... (Hereinafter referred to as the
(Details of duly authorized signatory)

"Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender (NIT No. .....) (Hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for..... (Name of work) hereinafter referred to as the "Contract".

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

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

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

Article 1: Commitment of the Principal/Owner

(1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:
   (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
   (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
   (c) The Principal/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.

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

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

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

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

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

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

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

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

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

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

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

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

Article 3 : Consequences of Breach

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

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

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

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

Article 4: Previous Transgression

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

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

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

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

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

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

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

Article 6 : Duration of the Pact

(1) This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 5 Years, after handing over of the site to the University Officials or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

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

Article 7: Other Provisions

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

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

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

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

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

Article 8 : LEGAL AND PRIOR RIGHTS

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

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

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

.....
(For and on behalf of Bidder/Contractor)

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

2.....
(Signature, name and address)

Place:

Dated:

FORM-G

FORMAT FOR LITIGATION HISTORY, LIQUIDATED DAMAGES, DISQUALIFICATION UNCONDITIONAL

[To be submitted on Bidder's **Original** Letter Head]

To,
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421

Subject: Litigation History, Liquidated Damages, Disqualification for ---------- (Name of Work /Project)

It is hereby declared that our firm (Name of firm with address--------) neither disqualified, nor have any Litigation history and no Liquidated Damage imposed on the firm by any Department.

Yours faithfully,

Date: (Signature, name and designation of the Authorized signatory)

Place: **Name and seal of Bidder**

FORM-H

UNDERTAKING FOR WATERPROOFING WORKS UNCONDITIONAL

[To be submitted on Bidder's **Original** Letter Head]

To
Sr. Project Manager (W.R.)
WAPCOS Limited,
Regional Office: 515, 5th Floor,
Shree Ugati Corporate Park, Opp. Pratik Mall,
Koba-Gandhinagar Road,Kudasan,
Dist. Gandhinagar, Gujarat-382421

Subject: Undertaking for waterproofing works --- (Name of the work / project)

Sir,
I/we hereby certify that I/we have inspected the site and well aware about the condition of water seepage in existing building which are to be water proofed after this up-gradation and renovation work by bidder and 05 years Guarantee against water proofing is to be provided.

Accordingly, It is certified that our firm will carry out the water proofing works under the scope of tender through certified Applicator of Specialized Renowned Waterproofing Agency either SIKA or FOSROC or BASF, so that there shall not be any problem of seepage in future and I / We hereby submit our BID considering all the facts.

Yours faithfully,

Date:

Place:

(Signature, name and designation of the Authorized signatory)

Name and seal of Bidder

FORM- I
FORMAT FOR UNDERSTANDING THE PROJECT SITE
[To be submitted on Bidder's Original Letter Head]

To,
Senior Project Manager (W.R)
WAPCOS Ltd,
515, 5th Floor, Shree Ugati Corporate Park,
Opp. Pratik Mall, Koba- Gandhinagar Road,
Kudasan, District : Gandhinagar, Gujarat-382421

Subject: Undertaking of the Site Visit for --- (Mention Name of the work)

Sir,
I/we hereby certify that I/we have visited/examined & inspected the site & its surrounding satisfactorily, where the work is to be executed as per the scope of works. I/ We are well aware about the following:

a) Topography of the area
b) Ground conditions, Site clearance at the site of work
c) Soil & rock conditions at the site of work
d) Availability of water & electricity
e) The existing roads and access to the site of work
f) Climatic conditions
g) Methodology to be adopted for successful completion of work
h) Nature of the ground & sub-soil of the site, Ground water level at work site and accessibility to the site
i) Hindrances, if any, which may arise during the execution of work

I/We have kept myself/ourselves fully informed of the provisions of this tender document comprising NIT, General Information, Form of Bid, Instructions to the Tenderer & Appendices, General Conditions of the Contract, Special Conditions of Contract, and Specifications, Annexure and Statement of advertised Quantities apart from information conveyed to me/ us through various other provisions in this tender document.

I / We hereby submit our BID considering above all facts gathered during site visit and each & every aspect have been considered in the Quoted cost of the work. I / We hereby confirm that no extra/additional cost shall be claimed on above aspects.

I/We have quoted my/ our rates for each of the items in "Schedule of Items".

Yours faithfully,

(Signature, name and designation of the
Authorized signatory)

Date:
Place:

Name and seal of Bidder

ANNEXURE- XIII: BANK GUARANTEE FORMAT FOR EMD
(To be submitted on Stamp paper of At least Rs.300 & above)

WHEREAS, M/s ……. having their Registered/Head Office at ……. (hereinafter called "the Bidder") has submitted his Bid dated …… for the …… [hereinafter called "the Bid"] to M/s WAPCOS Limited (hereinafter called the Employer) KNOW……ALL……PEOPLE by these presents that……we …… (name of the Bank) having our head office at ……(hereinafter called "the Bank") are bound unto Employer in the sum of …… for which payment well and truly to be made to the Employer, the Bank binds itself, its successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this ……day of ……. month…… year.

THE CONDITIONS of this obligation are:

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified;

OR

(2) If the Bidder having been notified of the acceptance of his bid by …… during the period of Bid Validity: We undertake to pay to the …… up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Bidder will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above mentioned two conditions and specify the occurred condition or conditions.

This Guarantee will remain in force up to and including the date …… after the deadline for submission of Bids as is stated in the instructions to Bidders or as it may be extended by the…… notice of which extension(s) to the Bank is hereby waived and notice to the bidder would constitute sufficient notice to the Bank. Any demand in respect of this guarantee should reach the Bank not later than the above date. or any part thereof under this guarantee only and only if you serve upon us a written claim or demand in terms of the guarantee before…… (indicate a period twelve months after the date of issue of Bank Guarantee).

DATE

SIGNATURE:

(Signature of Witness)

SEAL

SECTION – VII
SCOPE OF WORK

SECTION-VII
SCOPE OF WORK

1.0 BRIEF SCOPE OF WORK

The Scope of work shall include execution of work in accordance with Detailed Specifications of all the works; Tender Drawings, Architectural, Structural & Services Drawings, list of Approved makes of works, General Technical specifications of works and other conditions stipulated in Tender Document.

A. DESIGN AND DRAWAINGS OF PROJECT / WORKS

The drawings given in the tender document to understand the detailed scope of the work. Tender drawings will be revised/ modified as per the site conditions, technical requirements as per the Indian Standard of Codes, as per client requirements, and due to unforeseen conditions and as per the decision by Engineer In-charge.

All the Good for Construction (GFC) Drawings required for the execution of work as per the scope of work will be provided by WAPCOS. If Contractor found any discrepancy in the issued GFC drawings, he may bring same to the notice of WAPCOS before execution, as safety and stability of the structure is also the responsibility of the Contractor

The Contractor will submit the detailed PERT/ CPM chart to WAPCOS after award of the work so that planning of release of stage-wise drawings may be ensured. Accordingly, stage-wise GFC drawings will be released as per the progress of the works achieved by the Contractor. The GFC drawings will be issued after scrutiny of the drawings by WAPCOS and proper approvals from Client. No advance drawings shall be issued to the Contractor. The Contractor may make advance planning according to the drawings attached with the Tender document as the drawings are detailed and comprehensive

B. NOC'S / APPROVALS/ CLEARANCE OF PROJECT FROM LOCAL BODIES/ AUTHORITIES

- The Contractor will take necessary Statuary Approval/NOC from Fire and safety Department of local Authority/ Department.
- The Contractor will take necessary Statuary Approval/ NOC from local Municipal/Government Department for new Construction work.
- The Contractor will take necessary Statuary Approval/ NoCs Clearance from all concern Local Authorities / Departments, if any, required before start of the work / during the work / after execution of work & before handing over the Project.
- The fee for getting these approval, shall be deposited by the Contractor to the concerned Department / Authorities and will be reimbursable to the Contractor on producing of original receipt of deposited fee and no extra cost for the same shall be claimed by the contractor.
- The contractor shall mobilize the resources at site after getting approval / NoCs/ Clearance from all concern Local Authorities / Departments if any, essential before start of the construction and shall not make any claim due to any delay in approval.

C. GEOTECHNICAL INVESTIGATION

Soil exploration and soil investigation work have already been carried out by WAPCOS. The report of the same may be referred in WAPCOS office during working hours to understand the Soil Properties, Soil Bearing Capacity (SBC) and other parameters before quoting the rates.

D. TOPOGRAPHICAL SURVEY

The detail Topographical Survey work of entire site has already been carried out by WAPCOS

and enclosed with this tender Document in drawing section. However, Contractor/ Bidder may carry out detail survey at his own cost, to verify the survey data provided by the WAPCOS and make own assessment about topography of site, before quoting rate and start of the Construction. No claim of Contractor in respect of discrepancy in topographical survey / levels shall be entertained.

2.0 WORKS OF THE PROJECT

The works of the project shall be executed as per Architectural, Structural & Services Drawings, Bill of Quantity, list of Approved makes of works, General Technical specifications of works **and other conditions** mentioned in the tender document.

3.0 CIVIL WORKS

3.1 General Technical Specifications

The General Technical Specification of Civil Works are given at **Appendix-I** at this section of Scope of Works. The work will be executed as per the guidelines mentioned in the General Technical Specifications.

3.2 List of Approved Makes of Civil Works

Acceptable makes of materials for civil work to be used in the work are enclosed. In case of non-availability of these makes, after the approval of WAPCOS, the Contractor can use the alternative makes only BIS marked materials. Non BIS marked materials may be permitted by the WAPCOS only when BIS marked materials are not manufactured.

List of Approved Materials

Sr. No.	Material	Approved Brand
1	Cement	Ambuja, Ultratech, Sanghi, Kamal, Hathi, Binani , ACC, Siddhi
2	Sand	Sankheda, Bhadalpur, Chota udaipur, Bodali
3	White Cement	J.K., Birla
4	Coarse Aggregate (machine cut) 6 mm to 40 mm sizes	Sevaliya, Dhansura, Vadagam, Sathamba
5	Stone rubbles and gravels	Sevaliya, Dhansura, Vadagam, Sathamba
6	T.M.T./CRS Steel	SAIL, TATA, ET TMT, JSW steel Ltd., Nilkanth, JINDAL STEEL and POWER Ltd., National TMT.
7	Paver Block	Vyara, Super, Alcock
8	Ceramic Tiles, Vitrified Tiles, Glazed Tiles	Qutone, Johnson, Kajaria, AGL, Vermora
9	Acrylic / Oil Paint	Nerolac, Asian, Berger, Dulux
10	Distemper	Nerolac, Asian, Berger, Dulux
11	Water proofing compound	Fosroc, Dr. Fixit, Sikka, BASF
12	Aluminium Section	Jindal, Hindalco, Domal, National
13	Texture Paint	Asian Paint, Dulux, Berger Paint, Nerolac, Jotun.
14	Italian marble	CMC Classic Marble pvt.ltd / A-class / Nitco Marble / R.K marble pvt .ltd or Equivalent as approved by Architect.

Sr. No.	Material	Approved Brand
15	Granite	R.K. marble pvt .ltd / Petros stone / Classic Marble pvt.ltd / Oswal marble / Bhandari marble group / Jayantilal sons
16	Kota stone	R.K. marble pvt .ltd / Petros stone / Classic Marble pvt.ltd / Oswal marble / Bhandari marble group / Jayantilal sons
17	Raised/False Access Flooring	Unitile, Huiya, Huatong, Flexi / Access / Linder / Tate
18	Plywood	Kitply, Century Ply, Green Ply, Anchor, Duro
19	Laminate	Sunmica, Greenlam, Century, Signature, Royal Touch.
20	Veneer	Greenlam Deluxe Veneers, Century, Exotic Veneer, Signature, Kit.
21	Flush Door	Anchor, Century, Durodoor, Kit
22	Fire Rated Glassed door/Partition	Saint Gobain, Ais, Fg Glass
23	Door Closer	Hafele, Heti Ich, Ebco, Kitch
24	Handle	Hafele, Heti Ich, Ebco, Kitch
25	Glass Film	3m, Garware, Llumar.
26	Wall Putty	JK / Birla white
27	Adhesives	Pidilite / Bluecoat / Euro / Royal bond / McCoy / Bond tite / Astra / BAL
28	Floor Hardener	Ironite / Ferrok / Hardonate / Fosroc
29	Gypsum ceiling	SaintGobain Gyproc / USG BORAL / Asian Gypsum Industries Pvt.Ltd
30	Mineral Fibre Acoustical Suspended Ceiling System	Amstrong / Durlum / Anutone
31	Metal Ceilings	Amstrong / Durlum / Daiken
32	Calcium silicate false ceiling tiles	Aerolite / Hilux / Dekelite
33	Modular Glass Door & Partition With Profile Frame	Dorma / Assa abloy / Deko
34	Glass mosaic tiles	Italica / Palladio / Artistic tile / Bisazza / Picolo
35	Vinyl Flooring	Shaw / Robust / Solarbrite/ Wonder floor / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
36	Kerbstone	Vyara / Basant betons / Alcok
37	Epoxy Grouts - Tile joints	Kerakoll / Roff / Myk Laticrete, BAL endura
38	Stadium Chair	TSI / KF system / Featherlite
39	6.7 to 7.5mm thickness Sports Vinyl Flooring	Ebaco / Grabo / Horizon / tarkett
40	Sports Vinyl Flooring thickness of 4.0mm	Ebaco / Grabo/ Horizon / tarkett

Sr. No.	Material	Approved Brand
41	Kabaddi Matts (Size: 1 Metre X 1 Metre x 40mm thickness.)	Ebaco / BSW / Remp
42	Karate matt (Size: 1 meter x 1Meter)	Ebaco / BSW / Remp / EDEL International / Koxtons/Stage
43	Multipurpose Turf	Ebaco / EDEL / Condor / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
44	Wooden Sports flooring	Ebaco / tarkett / Horner / Robbins / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
45	ACRYLIC SPORTS FLOORING (8 LAYERS)	Ebaco / Vesmaco / Courtsol / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
46	Shooting Range	HUB / Aakrid Sports Futuristic
47	Electrical Target Changer Pulley	EDEL International / Koxtons/Stage
48	Kneeling Roll	EDEL International / Koxtons/Stage
49	Badminton Pole set	EDEL International / Koxtons/Stage
50	UV treated Net	EDEL International / Koxtons/Stage
51	Table Tannis Table	EDEL International / Koxtons/Stage
52	Moveable Volleyball Pole set	Ebaco /EDEL International / Koxtons/Stage
53	Moveable and Foldable Basket ball set	Ebaco / EDEL International / Koxtons/Stage
54	Gym equipment	Star-trac / Nautilus / Stair Master / Octane / Pannata / Cybex / Gym80 / Throwdown
55	Patch fittings	Assa abloy / Geze / Dorma / Yale / Ozone
56	Sliding soft close channels	Assa Abloy / Geze / Hafele / brasseley
57	Bolts, Nuts, Washers	Kundan / Vardhaman / Hem Gandhi
58	Toughned Clear Glass	Saint Gobain / ASI / Modiguard
59	Clear Glass	Saint Gobain / ASI / Modiguard
60	Back Paint 5mm Glass	Saint Gobain / Asian Paints
61	Modular Toilet Cubical partition	Merino / Greenlam / Action Tesa
62	Urinal Partition	Merino / Greenlam / Action Tesa
63	Fabric Curtain	Cortina / De Décor / Pure / R R Décor / Greenteriors
64	Fabric	Cortina / De Décor / R R Décor / Greenteriors
65	Venetian / Vertical Blind / Roller / Blackout	Marvel / De Décor / MAC / Hunter Dougles / Vista
66	Marine Ply-Wood sheet	Century / Greenply / Durian / Kitply / Royale touch
67	High Pressure Laminate sheet (HPL)	Century / Greenlam / Merino / Fomica / Stylam
68	MDF Board	Century / Greenlam / Durian /Action tesa
69	Construction joint chemical	Sika, Nito Bond,

Note: During execution the Client have right to reject any of the above brand. If any of the above brands is not available in the market, the product of similar specification shall get approved before procuring such material.

4.0 GENERAL TECHNICAL SPECIFICATION OF ELECTRICAL AND OTHER WORKS

The General Technical Specification of electrical, Lift/ Elevator and other works are given at **Appendix-II** at this section of Scope of Works. The work will be executed as per the guidelines mentioned in the General Technical Specifications

LIST OF APPROVED MAKES FOR ELECTRICAL AND FIRE ALARM WORKS

Acceptable makes of materials for electrical and fire alarm work to be used in the work are enclosed. In case of non-availability of these makes, after the approval of WAPCOS, the Contractor can use the alternative makes only BIS marked materials. Non BIS marked materials may be permitted by the WAPCOS only when BIS marked materials are not manufactured.

LIST OF MATERIALS OF APPROVED BRAND /MANUFACTURE (ELECTRICAL WORKS)

1	**Modular accessories**	Havells, Anchor, Legrand, Schneider, C&S, Indoasian,
2	**R.C.C. Pipes**	Indian Hume Pipe Co., Alcock Cement Products,Patel Spun.
4	**Rigid PVC pipe (LMS, MMS, HMS)**	Precision, Anchor, Polycab, BLP, Vraj Plastic, Nihir
5	**Mains & Wires (FRLS)**	Finolex, Anchor, Havells, R.R. Kabel, Polycab, Darshan plus.
6	**TV Cable**	Finolex, Anchor, Havells, R.R. Cable
7	**Telephone cable**	Delton, Finolex, Anchor, Havells, R.R. Cable,
8	**Cat- 6 Wire**	Finolex, D-Link , Molex
9	**MCB & DB**	C&S, Siemens, L&T, Legrand, Anchor, Indoasian, HPL, Schneider
10	**ELCB ƒ RCCB**	C&S, Siemens, L&T, Legrand, Anchor, Indoasian, HPL,, Schneider
11	**Metal Clad Switch (ICDP, ICTP)**	AEW, PEW, SUPER, KEW, NILANG
12	**MCCB**	C&S, Siemens, L&T, Legrand, Indoasian, Schneider, HPL
13	**Change Over Switch**	C&S, Siemens, L&T, Legrand, Indoasian, Schneider, HPL
14	**Time Switch**	C&S, Siemens, L&T, Legrand, Indoasian, Schneider, HPL, GIC
15	**Current Transformer**	AE, Virat, Narmada, Kappa, Kalpa
16	**Power Terminal**	Connect well, Reputed
17	**Indication Lamp**	LED Type : Schneider, L&T, RASS
18	**Voltage/ Ameter Selector Switch**	L&T, Salzer
19	**XLPE Cables (Al. & Cu)**	Torrent, Havells, RR Kable, Finolex, , Polycab, KEI,
20	**Glands**	Compression type, Heavy duty and deep threading with rubber-ring and double washers. (Sample to be approved)
21	**Ceiling Fan**	USHA, Crompton, Bajaj, Orient, Havells
22	**Exhaust Fans**	USHA, Crompton, Bajaj, Orient, Havells, Almonard, Indoasian,
23	**LED Street Light**	Havell's, Philips, Panasonic, Wipro, or equivalent **(As suggested by Client/ Architect -Sample to be approved)**
24	**LED Indoor Light**	Havell's, Philips, Panasonic, Wipro, or equivalent **(As suggested by Client/ Architect -Sample to be approved)**

27	**LED Outdoor Light**	Philps, Lightberry, Optra, Wipro, K-lite, Rangelite, Prisha, Nirvana or equivalent**(As suggested by Client/ Architect -Sample to be approved)**
28	**SMC BOX For St. Lgt.**	Sintex, ESCO, EPP
29	**DG Set**	Engine: Cummins, Greaves, Kirloskar, Caterpillar Alternator: Crompton, KEC, Stamphord, Mahindra
30	**Lift (Premium. Category)**	OTIS, Mitsubishi, Schindler, Johnson, Orbis, Omega
31	**Aviation Light**	Alpha−Lite, Avaids Technovators Pvt Ltd.,Bajaj
32	**Fibre reinforced R.C.C. Manhole Cover**	Syntex, Pratibha, CIDCO, approved brand
33	**C.I. Manhole cover with Frame**	ISI approved make
34	**Motor Pump Starters**	C&S, L&T, Siemens, Havells, GE
35	**Busbar Chamber**	C&S, Siemens, L & T ,GE, Havells, Super
36	**DWC Pipe**	Rex, Gemini, Duraline, Nihir, Astral
37	**HDPE PIPE**	Dutron, or equivalent
38	**Street Light Pole**	Transrail, Bajaj, Valmont, Utkarsh, Ambica,
39	**Decorative Pole**	Lightric Studio (NIV) , K-lite , Equivalent, (As suggested by Client/ Architect -Sample to be approved)
40	**FRP Pole**	Creative Composite, Sumip composites
41	**Earthing & It's Accessories**	E−Link, Green Wire, Ashlok, Electro Earth, YANSI, LPI, RAPID
42	**Water Supply Pump Set**	Kirlosker, Crompton, Lubi, Amit
43	**PANLE MANUFACUTRE**	CPRI APPROVED
44	**STABILIZER**	POWER ELECTRICAL, PARTH CORPORATION, SERVO STABILIZER
45	**Cable Lugs**	Dowells, 3-D, Raychem.
46	**Fire Extinguisher**	Should be of ISI approved - Safex,Firex,Safeline
47	**PA System /Amplifier**	Bosch, Honywell, JBL, Equivalent, **(As suggested by Client/ Architect -Sample to be approved)**
48	**Speaker**	JBL, Bose, Electro Voice, Bosch, Honywell Or Equivalent, **(As suggested by Client/ Architect -Sample to be approved)**

Special Notes:

- **The MCB and MCB DBs must be of same make.**
- **The light/fan/switches etc… concealed/open boxes brand are not mention in tender document then must be same from switch and pipes brand .**
- **The contractor shall submit the sample of each item / component of above mentioned approved make for the approval of the Client/Architect/Consultant.**
- **Make of components required to be used by contractor to complete the installation, if not mentioned anywhere, shall be required to GOT IT APPROVED by Client/Architect/Consultant before installation in writing manner.**

5. Technical Specifications of PHE works

The General Technical Specification of PHE Works are given at **Appendix-III** at this section of Scope of Works. The work will be executed as per the guidelines mentioned in the General Technical Specifications

List of Approved makes for PHE and Sanitation Materials

Acceptable makes of materials for PHE and Sanitation Materials to be used in the work are enclosed. In case of non-availability of these makes, after the approval of WAPCOS, the Contractor can use the alternative makes only BIS marked materials. Non BIS marked materials may be permitted by the WAPCOS only when BIS marked materials are not manufactured.

APPROVED MAKE LIST

SR	ITEM DESCRIPTION	MAKE
01	Sanitary ware	Hindware / Jaquar
02	C P Fittings & Bathroom Accessories	Hindware / Jaquar
03	Stainless Steel Sink	Nirali/ Neelkanth/ Futura
04	C P Grating	Chilly/ Futura
05	Ball Valve	Sant/ Zoloto/ Honeywell
06	Gun Metal Wheel Valve	Sant/ Zoloto/ Honeywell
07	Pressure Reducing Valve	Sant/ Zoloto/ Honeywell
08	Butterfly Valve	Sant/ Zoloto/ Honeywell
09	Gun Metal - Non Return Valve	Sant/ Zoloto/ Honeywell
10	Cast Iron Manhole	NECO or Equivalent
11	Cast Iron Grating	NECO or Equivalent
12	UPVC Pipes/ Fittings	Astral/ Supreme/ Ashirvad
13	CPVC Pipes/ Fittings	Astral/ Supreme/ Ashirvad
14	SWR Pipes/Fittings	Astral/ Supreme/ Ashirvad
15	Water Meter	Sant/ Kranti/ Capstan
16	Water Level Indicator	Sant/ Sigma/ Gelco/ Honeywell
17	Hydro Pneumatic System	Willo/ Grundfos/ Xylem
18	Water Softener System	Pentair/ Ion Exchange/ PowerH2O/ Gopani/ Cleantech
19	Submersible Pumps	Franklin/ Grundfos/ Xylem
20	De watering Pump	Franklin/ Grundfos/ Xylem
21	Mud pump	Franklin/ Grundfos/ Xylem
22	Domestic RO system	Pentair/ Ion Exchange/ PowerH2O/ Gopani/ Cleantech
23	Water Cooler	Blue star/ Voltas/ Usha
24	Electric Geyser	A O Smith/ Venus/ Bajaj
25	Float Valve for OHT	Leader or Equivalent
26	Domestic R.O. System and U.V. system	PowerH2O/ Eureka Forbes/ Kent/ Gopani/ Cleantech

NOTE: 1) All materials shAlL conform to THE relevant standards or Code of Bureau of Indian standards and shall have ISI mark validated for the period of installation and take over. They SHALL also fulfil all hydraulic tests at site and shall be free from all noticeable deficiencies during the guarantee period as well.

2) ALL MAKES AND PRODUCT CATALOGUE NUMBERS SHOULD BE GOT APPROVED FROM ARCHITECT BEFORE PROCUREMENT BY THE CONTRATOR

6.0 Technical Specifications of Fire Fighting works

The General Technical Specification of Fire Fighting Works are given at **Appendix-IV** at this section of Scope of Works. The work will be executed as per the guidelines mentioned in the General Technical Specifications

List of Approved Makes for Fire Fighting Works

Acceptable makes of materials for Fire Fighting works to be used in the work are enclosed. In case of non-availability of these makes, after the approval of WAPCOS, the Contractor can use the alternative makes only BIS marked materials. Non BIS marked materials may be permitted by the WAPCOS only when BIS marked materials are not manufactured.

A. MAKE LIST

SR. NO	ITEM DESCRIPTION	MATERIAL
1	Air Release Valve	Swati / Sant / Newage
2	Butterfly Valves, Gate / Sluice Valve and Non return Valve	Sant / Leader / Zoloto
3	Branch pipe & Coupling	Swati / Winco / Newage
4	Centrifugal Pumps	Matter & Platt – Wilo / Grundfoss / Xylem / Kirloskar
5	Coating wrapping material for Underground pipe	IWL / STP / Tikidan
6	Fire Bridged Inlet Connection	Swati / Winco / Newage
7	Fire Extinguishers	Safex / Minimax / Kanex
8	Flow Switch	Honeywell / System Sensor / Potter / Newage / Viking
9	Globe Valve / Ball Valve	Sant / Leader / Zoloto
10	Hydrant Valve	Swati / Winco / Newage
11	Hose Pipe	Swati / Winco / Newage
12	Hose Reel	Swati / Winco / Newage
13	Hose Box	Swati / Winco / Newage
14	M.S. / G. I. pipes	TATA / Jindal (Hissar) / SAIL
15	Motor	ABB / CGL / Siemens / BHEL / Kirlosker / BBL
16	Pressure gauge	H. Guru / Fibig / General instrument
17	Pressure switch	Honeywell / Indfoss / Switzer
18	Power and Control cable	Polycab / Havell's / Finolex
19	Panels	CPRI approved
20	Strainer	Sant / Leader / Zoloto
21	Sprinklers & Flexible Hose / Fire Alarm valve	HD / Tyco / Newage / Viking
22	Signages	Prolite / Mr.Lite
23	Pump on/off switch	C & S / L&T / equivalent
24	Painting	Asian paint / Burger / Nerolac

7.0 Technical Specifications of VRF system of Air conditioning

The scope of works includes Supply, Installation Testing & Commissioning of VRF system of Air conditioning. The General Technical Specification of **VRF system of Air conditioning** system are given at **Appendix-V** at this section of Scope of Works. The work will be executed as per the guidelines mentioned in the General Technical Specifications

List of Approved Makes for Air conditioning works

S.No.	Items	Standard Makes
1	Air Cooled AC Units/ Split ACs	CARRIER/ HITACHI/DAIKIN/BLUE STAR
2	DX Type AHU	Zeco / Edgtech / VTS / Monash
3	Closed cell electrometric Pipe insulation	Armaflex/Supreme/A-Flex/K-Flex
4	Refrigerant Piping	Mandev/Total Line/ Rajco/Metube
5	Duct Acoustic Insulation	UP Twiga/ Owens Corning
6	Duct Insulation	Supreme/Paramount
7	Room Acoustic Insulation	UP Twiga/ Owens Corning
8	Grilles, Diffusers, Dampers, Laminar	Tristar/Carryaire/AFC
9	Fire Dampers	Tristar/Carryaire/AFC
10	G.I.Sheets for Ducts	SAIL/Jindal/Bhushan
11	Power/ Control Cables	Polycab/Libron/Havells
12	Hard PVC pipes	Polycab/Supreme/Prince
13	Armoured Power Cables	Gloster/Polycab/ Havells/ Libron
14	Starters/Contactors/ Overload Relay	L&T/ Siemans
15	Electrical Control Panel	As per approval From Consultant/ Client
16	Inline Fan	Caryair / Vents / Ostberg / Sphere

NAME OF WORK: "CONSTRUCTION FOR GUJARAT NATURAL FARMING SCIENCE UNIVERSITY, AT JAMBUDI VILLAGE, TALUKA HALOL, PANCHMAHAL DISTRICT (GIRLS HOSTEL, KITCHEN & DINNING HALL, GUEST HOUSE, E-2 TYPE QUARTERS, B-TYPE QUARTERS, D-TYPE QUARTERS, B-B1 TYPE QUARTERS, SANITATAION WORK, COMPOUND WALL)"

Document Name: SPECIFICATION INDEX

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
Earthwork					
	EARTHWORK: MANUAL EFFORTS EXCAVATION for foundation UP TO 1.50m DEPTH including sorting out and stacking of useful materials and disposing of the excavated stuff for all lead and lift for dense or hard soil including refilling the trenches, sides of foundations etc complete as directed by E.I.C.				
1	(B) Dense or Hard soil	Cmt	4.0.0 (B)	29	
2	(E) Hard Rock	Cmt	4.0.0 (E)	30	
	EARTHWORK: MANUAL EFFORTS EXCAVATION for foundation 1.50m to 3.00m DEPTH including sorting out and stacking of useful materials and disposing of the excavated stuff for all lead and lift for dense or hard soil including refilling the trenches, sides of foundations etc complete as directed by E.I.C.				
3	(B) Dense or Hard soil	Cmt	4.0.0.2.(B)	32	
4	(E) Hard Rock	Cmt	4.0.0.1.(E)	33	
5	Boring Holes 2.40m depth & 300mm dia. In ordinary soil (for cast in situ piles. etc complete as directed by EIC.		4.27(iii)	36	
6	**FILLING AVAILABLE EXCAVATED EARTH** (excluding rock) in trenches of plinth, sides of foundations etc in layers not exceeding 20 cm in depth consolidating each deposited layer by ramming, watering and dressing the top surface etc complete as directed by E.I.C.	Cmt	4.12	27	
7	**Providing and FILLING in plinth and foundation with MURRUM OR SELECTED SOIL in layers not exceeding 20cm in depth consolidating each deposited layer by ramming, watering, consolidating and dressing the top surface etc complete as directed by E.I.C.**	Cmt	4.004	28	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
8	Providing and injecting Chemical emulsion for **PRE - CONSTRUCTIONAL anti-termite treatment for all types of structure with / without basement with RCC foundation/RCC wall or with load bearing walled foundation or development areas tree pits, water body etc.** as per IS 6313 (Part-2)-1981 using chemicals like chloropyripos, Biflex TC, lindane etc. 20EC mixed with water in 1:19 ratio (1 liter chemical: 19 liters of water).Carrying out pre construction anti-termite treatment. A guarantee bond of 10 years shall be furnished in prescribed format on stamp paper. Rate shall be inclusive of material storage, safety and labor required for complete Anti Termite Treatment for injecting the emulsion at all stages mentioned below etc. complete all as per specification and directions of Engineer-in-charge. **Plinth area of building at ground floor only shall be measured.**a) Bottom surface and the sides of the excavation made for masonry foundations at the rate of 4 liters/ of surface area (wherever applicable).b) At the rate of 7.5 liter/ Sqm of surface area to the backfill at the depth of 500mm below the original ground level. The soil in the immediate contact with the vertical surface of RCC column shall be treated.c) Top surface of the plinth filling at the rate of 5 liter/Sqm of internal plinth area etc. complete.d) Internal vertical surface from original Ground level to top of the earth filled in the plinth at the rate of 7.5 liter/Sqm of surface area in contact.e) at the rate of 7.5 liter/ Sqm to the external vertical surface below finished Ground level to the full depth of the filling complete by injecting chemical after drilling the holes of 12 to 15mm dia, with depths of approx. 300 to 600 mm and at 150mm centre to centre and as close to the wall as possible.f) All holes for electrical data, water supply, drainage etc. shall be treated.	Smt	1.01		Technical Specification for Civil Work as Attached Separately
	Concrete Work				
9	Providing and laying C.C. 1:1½:3 including cost of formwork for Footing & Column up to plinth…. etc complete.	Cmt	5.4.1(A)+9.1(A)(I)+5.4.1(D) +9.1(G)(i)+17.58(I)	43+44+64+43+44+65+66 + 119	1) Read R.C.C. 1:1½:3 instead of 1:2:4

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
10	Providing and laying C.C. 1:1½:3 including cost of formwork for Ground beam…. etc complete.	Cmt	5.4.1(A)+9.1(A)(I)+5.4.1(D) +9.1(G)(i)+17.58(I)	43+44+64+43+44+65+66 + 119	1) Read R.C.C. 1:1½:3 instead of 1:2:4
11	Providing and laying C.C. 1:1½:3 including cost of formwork for Plinth beam…. etc complete.	Cmt	5.4.1(A)+9.1(A)(I)+5.4.1(D) +9.1(G)(i)+17.58(I)	43+44+64+43+44+65+66 + 119	1) Read R.C.C. 1:1½:3 instead of 1:2:4
12	Providing and laying ordinary C.C. (1:1½:3) for RCC work for Augur for all c/s area in foundation and plinth….. etc complete as directed by EIC.	Cmt	5.4.1(D)	43+44	1) Read R.C.C. 1:1½:3 instead of 1:2:4
13	Providing and laying CEMENT CONCRETE 1:4:8 (1 cement : 4 coarse sand : 8 machine cut stone aggregates 40 mm nominal size) and curing consolidation with rammers complete excluding cost of form work in (A) Foundation and Plinth… etc., complete as directed by E.I.C.	Cmt	5.4.1(D)	43+44	
14	**1:4:8** (1-Cement : 4-coarse sand : **8-machine cut stone aggregates 40 mm nominal size**)	Cmt	5.3.3.(A)	38	
	Providing, laying and fixing T.M.T. bar reinforcement Fe 500D (Tata tisco, kamdhenu, Nilkanth, National, Gallent, NRE, Vinayak) for R.C.C. work including cutting bending binding with binding wire and placing in position above Plinth level to floor Two level etc complete as directed by EIC and as per detail drawings.				
15	(D) Fe - 500D	kg	5.4.11 Except that reinforcement shall be of Grade Fe-500D confirming to IS: 1786	45	
16	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor two level up to floor three level	kg	5.4.13.(A)	45	
17	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor three level up to floor four level	kg	5.4.13.(A)	45	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
18	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor four level up to floor five level	kg	5.4.13.(A)	45	
19	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor FIVE level up to floor SIX level	kg	5.4.13.(A)	45	
20	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor SIX level up to floor SEVEN level	kg	5.4.13.(A)	45	
21	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor seven level up to floor eight level	kg	5.4.13.(A)	45	
22	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor eight level up to floor nine level	kg	5.4.13.(A)	45	
23	Extra for **additional lift of reinforcing steel** for all R.C.C. work above floor nine level up to floor ten level	kg	5.4.13.(A)	45	
24	Providing throating or plaster drip and moulding to R.C.C. Chhajja.	Rmt	5.4.18	39	
25	**Providing and laying cement concrete work 1:2:4 (1- Cement : 2- Coarse sand : 4- graded stone aggregates 20 mm nominal size) and finishing smooth with curing etc complete including the cost of providing formwork with sheeting of steel sheets but excluding the cost of reinforcement for foundations, footings, bases of column etc. & mass concrete. up to floor two within the site premises as directed by the Engineer - in - Charge.**	Cmt	5.4.1(C)+9.1(H)(I)+17.58(I)	43+44+65+119	
	Controlled Cement Concrete with Shuttering for Foundation etc.: Providing and laying controlled cement concrete and finishing smooth with curing etc complete including the cost of providing formwork with sheeting of steel sheets, compacting with vibrator, curing,centering & shuttering in true line and level etc but excluding the cost of reinforcement **for foundations, footings, bases of column etc. & mass concrete. up to floor two level** within the site premises as directed by the Engineer - in - Charge.				
26	M-150 BELOW FOOTING AND GRADE SLAB FOR FLOORING	Cmt	5.8.1 + 9.1. (A)	46 + 63	
27	M-250 FOR FOOTINGS	Cmt	5.8.3 + 9.1. (A)	47 + 63	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
28	P/L C.C. 1:1½:3 for Column having C/S area 0.050 to 0.085 sq.m including cost of formwork above P.L. to floor Two lvl…. etc complete.	Cmt	5.006(B)(II)++5.4.13+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
29	P/L C.C. 1:1½:3 for Column having C/S area 0.085 to 0.12 sq.m including cost of formwork above P.L. to floor Two lvl…. etc complete.	Cmt	5.006(B)(II)++5.4.13+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
30	P/L C.C. 1:1½:3 for Column having C/S area 0.05 to 0.085 sq.m including cost of formwork from floor Two lvl. to floor Three lvl…. etc complete.	Cmt	5.006(B)(II)++5.4.13+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
31	P/L C.C. 1:1½:3 for Column having C/S area 0.085 to 0.12 sq.m including cost of formwork from floor Two lvl. to floor Three lvl…. etc complete.	Cmt	5.006(B)(II)++5.4.13+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
32	P/L C.C. 1:1½:3 for Column having C/S area 0.120 to 0.180 sq.m including cost of formwork from floor Three lvl. to floor Four lvl…. etc complete.	Cmt	5.006(B)(II)++5.4.13+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
	Controlled Cement Concrete with Shuttering for Columns etc.: Providing and laying controlled cement concrete and finishing smooth with curing etc complete including the cost of providing formwork with sheeting of steel sheets compacting with vibrator, curing, centring & shuttering in true line and level etc. but excluding the cost of reinforcement **for columns, pillars, posts, struts etc.** within the site premises as directed by the Engineer - in - Charge.				
	from top of foundation up to floor two				
33	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	above floor two up to floor three				
34	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	above floor three up to floor four				
35	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	above floor four up to floor five				
36	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	From Floor five up to floor six				

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
37	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	From Floor six up to floor seven				
38	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	From Floor seven up to floor eight				
39	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	From Floor eight up to floor nine				
40	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
	From Floor nine up to floor ten				
41	Providing and laying RCC 1:4:8 (1-Cement: 4-Sand: 8-Graded Stone Aggregates 20 mm nominal size) and finishing smooth with curing etc complete including the cost of providing formwork with sheeting of steel sheets, compacting with vibrator, curing,centering & shuttering in true line and level etc but excluding the cost of reinforcement for columns, pillars, posts, struts etc. within the site premises as directed by the Engineer - in - Charge.	Cmt	5.3.3.(A) + 9.1. (G)(I) +9.2.	38 + 65 + 58	
42	M-250	Cmt	5.8.3. + 9.1. (G)(I) + 9.2.	47 + 65 + 58	
43	P/L C.C. 1:1½:3 for Beam having C/S area 0.05 to 0.085 sq.m including cost of formwork above P.L. to floor Two lvl…. etc complete.	Cmt	5.006(A)(I)+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
44	P/L C.C. 1:1½:3 for Beam having C/S area 0.12 to 0.18 sq.m including cost of formwork from floor Two lvl. to floor Three lvl…. etc complete.	Cmt	5.006(A)(I)+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
45	P/L C.C. 1:1½:3 for Beam having C/S area 0.05 to 0.08 sq.m including cost of formwork from floor Three lvl. to floor Four lvl…. etc complete.	Cmt	5.006(A)(I)+17.58(I)	49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
46	P/L C.C. 1:1½:3 for Sill including cost of formwork above P.L. to floor Two lvl... etc complete.	Cmt	5.4.1(C)+9.1(B)(I)+9.1(I)(i) +17.58(I	43+44+64+65+ 119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
47	P/L C.C. 1:1½:3 for Lintel including cost of formwork above P.L. to floor Two lvl... etc complete.	Cmt	5.005+17.58(I)	48+49+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
48	P/L C.C. 1:1½:3 for Chajja including cost of formwork above P.L. to floor Two lvl... etc complete.	Cmt	5.4.4+17.58(I)	44+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
49	P/L C.C. 1:2:4 for Coping including cost of formwork from floor Two lvl to floor Three lvl... etc complete.	Cmt	5.4.1(C)+9.1(I)(i)+5.4.13 +17.58(I)	43+44+65+4 6+ 119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
	Controlled Cement Concrete with Shuttering for Beams, Lintels etc.: Providing and laying controlled cement concrete and finishing smooth with curing etc complete including the cost of providing formwork with sheeting of steel sheets, compacting with vibrator, curing,centering & shuttering in true line and level etc but excluding the cost of reinforcement **for sides and soffits of beams, beam haunchings, cantiliesrs, copings and lintets not exceeding 1 m in depth etc. up to floor two** within the site premises as directed by the Engineer - in - Charge.				
	from top of foundation up to floor two				
50	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
51	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	above floor two up to floor three				
52	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
53	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	Above floor Three up to floor Four				
54	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
55	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	Above floor four up to floor five				
56	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
57	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	From Floor five up to floor six				
58	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
59	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	From Floor six up to floor seven				
60	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
61	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	From Floor seven up to floor eight				
62	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
63	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	From Floor eight up to floor nine				
64	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
65	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
	From Floor nine up to floor ten				
66	M-200	Cmt	5.8.2. + 9.1. (H)(I) + 9.2.	47 + 65 + 58	
67	M-250	Cmt	5.8.3. + 9.1. (H)(I) + 9.2.	47+65+58	
68	P/L C.C. 1:1½:3 for Slab having th. more than 10cm & upto 13cm including cost of formwork above P.L. to floor Two lvl…. etc complete.	Cmt	5.001(III)+17.58(I)	48+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
69	P/L C.C. 1:1½:3 for Slab having th. more than 13cm & upto 15cm including cost of formwork from floor Two lvl to floor Three lvl…. etc complete.	Cmt	5.001(III)+17.58(I)	48+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
70	P/L C.C. 1:1½:3 for Slab having th. more than 13cm & upto 15cm including cost of formwork from floor Three lvl to floor Four lvl…. etc complete.	Cmt	5.001(III)+17.58(I)	48+119	1) Read R.C.C. 1:1½:3 instead of 1:2:4.
	Controlled Cement Concrete with Shuttering for Slabs, Landings etc.: Providing and laying controlled cement concrete and finishing smooth with curing etc complete including the cost of providing formwork with sheeting of steel sheets, compacting with vibrator, curing,centering & shuttering in true line and level etc but excluding the cost of reinforcement for flat surfaces such as soffits of slab, landing and the like within the site premises as directed by the Engineer - in - Charge.				
	foundation level upto floor two level				
71	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2.	47+64+58	
	Above floor two up to floor three				
72	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2.	47+64+58	
	Above floor Three up to floor Four				
73	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2.	47+64+58	
	Above floor Four up to floor Five				
74	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2.	47+64+58	
	Above floor five up to floor SIX				
75	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2	47+64+58	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	Above floor six up to floor seven				
76	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2	47+64+58	
	Above floor seven up to floor eight				
77	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2	47+64+58	
	Above floor eight up to floor nine				
78	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2	47+64+58	
	Above floor nine up to floor ten				
79	M-250	Cmt	5.8.3. + 9.1. (B)(I) + 9.2	47+64+58	
	Controlled Cement Concrete with Shuttering for wall etc.: Providing and laying controlled cement concrete and finishing smooth with curing etc complete including the cost of providing formwork with sheeting of steel sheets, compacting with vibrator, curing,centering & shuttering in true line and level etcbut excluding the cost of reinforcement for flat surfaces such as soffits of slab, landing and the like up to floor two within the site premises as directed by the Engineer - in - Charge.				
	foundation level upto floor two level				
80	M-250	Cmt	5.8.3. + 9.1. (B)(II) + 9.2.	47+65+58	
	Above floor two up to floor three				
81	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	
	Above floor three up to floor four				
82	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	
	Above floor four up to floor five				
83	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	
	Above floor fiver up to floor SIX				
84	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	
	Above floor six up to floor seven				
85	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	
	Above floor seven up to floor eight				
86	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	Above floor eight up to floor nine				
87	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	
	Above floor nine up to floor ten				
88	M-250	Cmt	5.8.3. + 9.1. (C) + 9.2.	47+65+58	
	Controlled Cement Concrete with Shuttering for Staircase etc.: Providing and laying controlled cement concrete for curing complete including the cost of providing formwork with sheeting of steel sheets, compacting with vibrator, curing,centering & shuttering in true line and level etc but excluding reinforcement for reinforced concrete work within the site premises as directed by the Engineer - in - Charge.				
	foundation level upto floor two level				
89	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
	Above floor two upto floor three				
90	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
	Above floor three upto floor four				
91	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
	Above floor four upto floor five				
92	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
	From Floor five up to floor six				
93	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
	From Floor six up to floor seven				
94	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
	From Floor seven up to floor eight				
95	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
	From Floor eight up to floor nine				
96	M-250	Cmt	5.8.3. + 9.1. (M) + 9.2.	47+66+58	
97	Providing and **fixing premoulded compressible filler board in black colour** confirming to MoRT&H Specifications (Clause 1015), having minimum density 95kg/cum, non-staining with less than 1% water absorption & compression recovery of 93% minimum as per specification including				

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	cutting to required size and shape at all levels etc. complete as directed by EIC.				
98	for 40 mm wide expansion joint	Smt	2.05		Technical Specification for Civil Work as Attached Separately
	Labour Charges for **making holes in RCC wall, slabs or any other RCC members by diamond core cutting machine of HILTI or equivalent** including disposing the debris as per drawing or instruction of E.I.C. Measurement will be taken for the depth of holes in running meter. For all floors / all levels / all heights.				
99	Holes from 50 mm to 80 mm dia.	Rmt	2.06		Technical Specification for Civil Work as Attached Separately
100	From 100 to 160 mm dia.	Rmt	2.06		Technical Specification for Civil Work as Attached Separately
101	From 160 to 225 mm dia.	Rmt	2.06		Technical Specification for Civil Work as Attached Separately
	Labour Charges for **making holes in Brick wall or any surface by diamond core cutting machine of HILTI** or equivalent including disposing the debris as per drawing or instruction of E.I.C. Measurement will be taken for the depth of holes in running meter for all floors / all levels / all heights.				
102	Holes up to 100 mm dia	Rmt	2.07		Technical Specification for Civil Work as Attached Separately
103	From 101 to 150 mm dia	Rmt	2.07		Technical Specification for Civil Work as Attached Separately
104	From 151 to 300 mm dia	Rmt	2.07		Technical Specification for Civil Work as Attached Separately
	Providing in position P**VC sleeves of 6kg/cm2 UPVC pipes of following diameters for taking out service pipelines, cables etc.** in slabs, beams, brickwork as per drawing in required level and gradient for all floors / all levels / all heights.				
105	50 mm dia.	Rmt	2.09		Technical Specification for Civil Work as Attached Separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
106	75 mm dia.	Rmt	2.09		Technical Specification for Civil Work as Attached Separately
107	110 mm dia.	Rmt	2.09		Technical Specification for Civil Work as Attached Separately
108	160 mm dia.	Rmt	2.09		Technical Specification for Civil Work as Attached Separately
109	225 mm dia.	Rmt	2.09		Technical Specification for Civil Work as Attached Separately
	Masonry Work				
	Providing and laying BRICK WORK using common burnt clay building conventional brick having crushing strength not less than 35 Kg/Sq.cm. l in cement mortar 1:6 (1 cement : 6 fine sand) in true line and level including curing, scaffolding, rackingout the joints etc complete as directed by E.I.C.				
110	(B) Conventional	Cmt	6.13.(A)	51	
	Providing and laying BRICK WORK using common burnt clay building conventional brick having crushing strength not less than 35 Kg/Sq.cm. l in cement mortar 1:6 (1 cement : 6 fine sand) in true line and level including curing, scaffolding, rackingout the joints etc complete as directed by E.I.C. **Conventional Bricks**				
111	**In superstructure above plinth level up to floor two level (GF)**	Cmt	6.13(A)+6.19(B)	51+53	
112	**In superstructure above floor two up to floor three level (1st Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
113	**In superstructure above floor three up to floor four level (2nd Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
114	**In superstructure above floor four up to floor five level (3rd Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
115	**In superstructure above floor five up to floor six level (4th Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
116	**In superstructure above floor six up to floor seven level (5th Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
117	**In superstructure above floor seven up to floor eight level (6th Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
118	**In superstructure above floor eight up to floor nine level (7th Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
119	**In superstructure above floor nine up to floor ten level (8th Floor)**	Cmt	6.13(A)+6.19(B)+6.2	51+53+54	
120	Providing and lyaing HALF BRICK WORK using common burnt clay building conventional brick having crushing strength not less than 35 Kg/Sq.cm.				

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	from Plinth level to floor Two level in cement mortar 1:4 (1 cement : 4 fine sand) in true line and level including curing, scaffolding, rackingout the joints... etc. complete as directed by E.I.C.				
121	In superstructure above plinth level up to floor two level (GF)	Smt	6.30.II(B)+6.33(B)	54+56	
122	In superstructure above floor two up to floor three level (1st Floor)	Smt	6.30.II(B)+6.33(B)	54+56	
123	In superstructure above floor three up to floor four level (2nd Floor)	Smt	6.30.II(B)+6.33(B)	54+56	
124	In superstructure above floor four up to floor five level (3rd Floor)	Smt	6.30.II(B)+6.33(B)	54+56	
124	In superstructure above floor five up to floor six level (4th Floor)	Smt	6.30.II(B)+6.33(B)	54+56	
125	**In superstructure above floor six up to floor seven level (5th Floor)**	Smt	6.30.II(B)+6.33(B)	54+56	
126	**In superstructure above floor seven up to floor eight level (6th Floor)**	Smt	6.30.II(B)+6.33(B)	54+56	
127	**In superstructure above floor eight up to floor nine level (7th Floor)**	Smt	6.30.II(B)+6.33(B)	54+56	
	Wood Work & Joinery				
128	**For Door HEight of 2.4 m:** Providing & fixing in position door frame of size 125 mm x 65 mm as per drawing made from best quality selected well seasoned Indian Teak wood including making rebate, smoothening, sand papering, making the edges rounded, fixing the same using appropriate anchor fasteners of Hilti or equivalent viz HRD C 10x120/50 – 3 numbers in each vertical and 2 numbers in horizontal frame member including applying tar or black japan paint to outer surface contected to masonary or RCC and lacquer polishing to wooden surfaces as per drawing, design & direction, sample to be got approved by Architect / Engineer-in-charge etc complete. Including necessary IS 710 ply /teak rough ground/packing, filling the teak wood patti on either side all around the frame. Backer-rod, neutral cure G/M silicon sealant, anchor fastener, screws, fevicol, araldite, nails etc complete. I**ncluding providing and fixing 35 mm thick solid core flush type door** as per IS 2202 (part 1) (non decorative) of approved manufacturer. Battens should be chemically treated & kiln seasoned & binding agent should be phenol formaldehyde and of required size, as per approved drawing, designs and direction. Including external lipping of 10 mm thickness of seasoned teak wood equivalent to best quality indian teak all	Sqm	6.06		Technical Specification for Civil Work As attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	around all edge as per approved drawing, design & direction etc complete, sample must be got approved by the Architect or Engineer-in-charge. (Necessary hardware like hinges, pivot, handle, tower bolts, locks etc. shall be measured separately and paid in the relevant tender items.) The flush shutter shall also be **finished on either side with 1 mm thick Laminate sheet Decowalnut Lightbrown of Century ply or equivalent** with necessary nails, screws, adhesives, 10 mm thick best quality ghana teak lipping patti for hinge or pivoted shutter as per drawings and approved sample. Laminate shall be either glossy or Swede finish as decided by EIC. The rate shall be inclusive of lacquer polishing on the lipping and for all heights, all floors, all places, etc. complete. **The fix panel above shall be provided with 5 mm thick clear float glass being fixed with necessary bidding. The frame fix panel portion shall be provided with 12 mm thick solid round MS bars being finished** as per detail drawing including primer coat of red oxide and approved quality enamel paint for security etc. complete.				
129	**For Door Height of 2.1 m:**Providing & fixing in position door frame of size 125 mm x 65 mm as per drawing made from best quality selected well seasoned Indian Teak wood including making rebate, smoothening, sand papering, making the edges rounded, fixing the same using appropriate anchor fasteners of Hilti or equivalent viz HRD C 10x120/50 – 3 numbers in each vertical and 2 numbers in horizontal frame member including applying tar or black japan paint to outer surface contected to masonary or RCC and lacquer polishing to wooden surfaces as per drawing, design & direction, sample to be got approved by Architect / Engineer-in-charge etc complete. Including necessary IS 710 ply /teak rough ground/packing, filling the teak wood patti on either side all around the frame. Backer-rod, neutral cure G/M silicon sealant, anchor fastener, screws, fevicol, araldite, nails etc complete. I**ncluding providing and fixing 35 mm thick solid core flush type door** as per IS 2202 (part 1) (non decorative) of approved manufacturer. Battens should be chemically treated & kiln seasoned & binding agent should be phenol formaldehyde and of required size, as per	Sqm	6.07		Technical Specification for Civil WorkAs attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	approved drawing, designs and direction. Including external lipping of 10 mm thickness of seasoned teak wood equivalent to best quality indian teak all around all edge as per approved drawing, design & direction etc complete, sample must be got approved by the Architect or Engineer-in-charge. (Necessary hardware like hinges, pivot, handle, tower bolts, locks etc. shall be measured separately and paid in the relevant tender items.) The flush shutter shall also be **finished on either side with 1 mm thick Laminate sheet Decowalnut Lightbrown of Century ply or equivalent** with necessary nails, screws, adhesives, 10 mm thick best quality ghana teak lipping patti for hinge or pivoted shutter as per drawings and approved sample. Laminate shall be either glossy or Swede finish as decided by EIC. The rate shall be inclusive of lacquer polishing on the lipping and for all heights, all floors, all places, etc. complete.				
	Providing & fixing **butt hinge** of specific size of specified SS grade brush finish with necessary screws etc. complete of specified make and sample as approved by Architect and Engineer in Charge.				
130	a) **102 x 76 x 3 mm** - SS 304 grade of KICH model no. PRBHB34S	Nos.	6.08a		Technical Specification for Civil Work As attached separately
131	Providing & fixing Mortise lock (9"body) with 60 mm Europrofile Pin Cylider of **KICH model no. PRPCKNS60/PRML9BS** with both side key /one side key -one side knob with one pair of rose for wooden /aluminum doors with necessary ss phillips head screws etc .complete as per drawing and sample approved by Architect /EIC .Rate shall be for all heights ,all floors and all places. **KICH**	Nos.	6.09		Technical Specification for Civil Work As attached separately
132	Providing & fixing 19 mm diameter SS 316 satin (brush) finish Mortise handle in pair of **KICH (MH193)**with necessary SS phillips headscrews etc. complete, as per drawing as approved by Architect and Engineer-in-charge. Rate shall be for all heights ,all floors and all places .	Pair	6.10		Technical Specification for Civil Work As attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
133	Providing & fixing of specified height (minimum rod size shall be 10mm) SS 304 satin finish tower bolt of KICH in wooden doors/Aluminium doors, with necessary screws etc. complete as approved by Architect and Engineer-in-charge.(10" long (minimum rod size shall be 16mm) "J" type SS 304 satin finish of KICH model PRAD93610SR)	Nos.			
134	Providing and fixing Night Latch Key & Knob (Double Bolts) Standard Key of KICH model no. NLKN12S with necessary screws, pins, bolts etc. complete as approved by Engineer in Charge.	Nos.			
135	Providing and fixing DOOR VIEWER (IN BRASS) of KICH model no. DV12S with necessary screws, pins, bolts etc. complete as approved by Engineer in Charge.	Nos.			
136	Providing & fixing 25 mm diameter SS 316 satin finish C shape push-pull handles in pair of **KICH model no. PHC2518** with necessary screws etc. complete, as per drawing as approved by Architect and Engineer-in-charge.Rate shall be for all heights ,all floors and all places . a) 450 mm long	Pair	6.20a		Technical Specification for Civil Work As attached separately
137	P/F 30mm th. Both side Laminated water proof Flush Door shutter including indian teak wood frame 10 x 7cm including oil paint etc…. complete.	Nos	Spe.-5	9,10	Item should be carried out as per detailed drawing.
138	Providing, fabricating & fixing in walls M.S. C.R.C. Japan sheet of 16 gauge frame & 18 gauge shutter for Cupboard including priming & painting ….. etc complete.		Spe.-6		Technical Specification for Civil Work As attached separately
139	Providing and fixing **DOOR CLOSER** (IN SLIVER) of **KICH model no. DC511S** with necessary screws, pins, bolts etc. complete as approved by Engineer in Charge.	Nos.	6.18		Technical Specification for Civil Work As attached separately
Steel, Aluminum & Iron Works					
140	Providing, fabricating & fixing Structural steel work (Confirming to IS 4923-1997) riveted, bolted or welded in builtup for all type sections, in framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer and Painting two coats (excluding priming	kg	13.4		Technical Specification for Civil Work As attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	coat) on new steel and other metal surface with enamel paint, brushing, interior to give an even shade including cleaning the surface an even shade including cleanicn the surface of all dirt, dust and other foreign matter. all complete as per the structural designs and directions of Engineer in charge.				
141	Providing and fixing in position collapsible steel shutters with vertical channels 20 x 10 x 2 mm braced with flat iron diagonals 20 x 5 mm size with top and bottom rails of T_rin 40x 40 x 6 mm with 38mm dia, steel pulleys complete with bolts, nuts, locking arrangements, stoppers handles including applying a priming coat of red lead paint and finishing by Painting two coats (excluding priming coat) on new steel and other metal surface with enamel paint, brushing, interior to give an even shade including cleaning the surface an even shade including cleanicn the surface of all dirt, dust and other foreign matter. all complete as per the structural designs and directions of Engineer in charge.	Sqm	11.6 + 19.7	81+138	
142	Providing and fixing standared extruded of alluminium section of size 63mm x 38.10mm x 1.2mm @ Wt. 0.643 Kg/mt with **colour anodized alluminium frame for ventilation with 5 mm thick frosted glass** as details etc complete for Ventilation.	Sqm	7.28		Technical Specification for Civil Work As attached separately Except that the aluminum memebers shall be finished with avg. 5-micron colour AC25 anodizing of shade as approved by the Engineer - in - Charge.
143	Providing and fixing in position **frames for aluminium door / composite door-window / window / casement window and aluminium door shutters (sliding / side hung/ pivote) window shutters (sliding / fixed / openable - casement) as per approved shop drawings (Shope drawings to be prepared by the contractor and to be approved by the Client and Consultant)** and aluminum sections of approved make like Jindal or equivalent having Anodizing finish with anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade	kg	7.33a		Technical Specification for Civil WorkAs attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	AC25 for non exposed side of approved shade sections all floors / all levels / all heights / all shapes and for all sizes as per the drawing, specification or as directed by Architect or Engineer - in - Charge .Rate shall be inclusive of providing **aluminium sections (domal or Euro-profile), cutting, fabrication, errection and fixing to the best workmanship manner, including** 1) Sheet metal screws and aluminium angle corner cleat of minimum 3mm thickness and of full width etc for assembling the frame and shutter; 2) Glazing clips for receiving infill panel; 3) Best quality wool pile where ever shutter touches the frame and EPDM rubber; 4) Anchor fasteners of HILTI HRDUGT or equivalent for fixing the frame assembly to the RCC or masonry surfaces. Minimum 1 anchor fastener shall be used for every 750mm length of section for stability of frame. 5) 10mm GI tie rod for connecting vertical stile at top and bottom. Work shall have to be carried out as per the approved shop drawings and approved sample. Actual weight of installed Aluminium sections which are visible shall only be measured and shall be considered for the payment. Infill panels shall be paid in relevant tender items.				
144	**Clear Float Glass:** Providing and fixing clear float glass of specified thickness in frame work, shelves with necessary cutting of glass as per drawing & specifications including providing and fixing EPDM quality rubber for aluminum sections / filling transparent neutral cure glazed & metal silicon sealant of approved make on the periphery of the glass & wood etc. complete at all floors, all levels, all hights and in all shapes as per the directions of Architect/Engineer-in-charge. Rate shall be inclusive of glass finshing,consumable hardware, tools, tackles etc. Actual installed area of glass shall be measured and paid in sqm. **a) 6 mm thick**	Sqm	7.34		Technical Specification for Civil Work As attached separately
145	Providing & fixing **110 cm high stainless steel railing made from anti corrosive 304 grade s.s. Pipe of 50 mm dia (16 gauge) as hand rail with s.s. 304 grade baluster** as a vertical support fixed in RCC slab at 1.66 mt c/c including three horizontal s.s. Pipe of 20 mm dia (16 gauge) at equal	Rmt	7.35		Technical Specification for Civil WorkAs attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	distance connected with balusters including accessories as per detailed drawing as a directed etc complete to the satisfaction of engineer in charge. The balustrade would be fixed onto floor with casted base plate of minimum 6mm thickness anchored down on slab with Hilti fasteners. Base plate shall be concealed with suitable S.S. cover cap so that the mounting anchor fasteners are not visible after installation. Rates should be inclusive of welding, grinding, buffing, polishing and making curvature (wherever required) fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer/Architect. For payment purpose, length of handrails will be taken (between two outer balusters) excluding the length of railing beyond balustades				
146	Providing and fixing in position **SS 304-15mesh x27 gauge Mosquito net for aluminium sliding shutter / fixed shutter or in front of aluminium louvers** as per approved shop drawing and sample as approved by Architect or Engineer-in-charge, at all floors, all levels, all hights. Only mosquito net shall be measured and paid in Sqm. All aluminum sections shall be paid under relevant tender item in kg.	Sqm	7.36		Technical Specification for Civil Work As attached separately
	Providing and Fixing in positionlock and handle system for aluminium sliding shutters including all necessary material, labour, hardware, accessories etc. complete				
147	Around 165MM ECO CONCEALED SLIDING LOCK AUTO of HIVIK / PEGO / Swastik Aluglaze.	No.	7.37		Technical Specification for Civil Work As attached separately
148	Providing and fixing aluminium louvered glass Ventilator…… etc complete as directed by EIC.				Technical Specification for Civil Work As attached separately
149	Providing and fixing in position frames for aluminium door / composite door-window / window / casement window and aluminium door shutters (sliding / side hung/ pivote) window shutters (sliding / fixed / openable -		7.33a		Technical Specification for Civil Work As attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	casement) as per approved shop drawings…… etc complete as directed by EIC.				
150	P/F M.S. Grill in possition including priming and painting …etc complete.		10.100(A)+19.2+19.19	76++139+140	Item should be carried out as per detailed drawing.
151	Providing and fixing M.S. pipe for Elevation treatment (Fixed / openable) …..etc complete as directed by EIC.				Item should be carried out as per detailed drawing.
	Water Proofing				
152	Providing & laying cement water proofing of average 115mm thick for terrace for all floors using first layer cement mortar (1:3) over an exsisting surface second layer of arranging brick bats acording to slop adding suitable chemical to make water tieght & again third layer of cement mortar 1:3 on above including adding water proffing compound and finishing top with net cement slury using cement @ 2.75 kg/sq mt. making any patterns and vatas at the end junction and design on the top etc complete as directed by EIC.	Sqm	10.14		Technical Specification for Civil Work As attached separately
153	Surface Preparation and Leak test:- The surface of application must be thoroughly prepared by mechanical means, to remove all loose particles, laitance, etc. - Oil and grease, if any, must be de-greased with suitable solvents. It then must be washed off with jet of water and brought to touch dry state.- Chase the construction joints, cracks and seal the same by, a) groove filling by, a.1) forming a U shaped groove of size (width and depth) as required as per manufacturer's specifiatoin & made clean a.2) apply priming coat of Dr. Fixit pidiprime or equivalent and, a.3) Fill the groove with Dr. Fixit PU sealant or equivalent. and,b) Grouting by,b.1) Drilling hole of required size into the structure and fixing grouting nozzle. Allowing nozzle to set for 24 hours, b.2) grouting the nozzles with Cement Slurry admixed with Dr. Fixit Pidicrete AM @ 225 gm/bag of cement, non-shrink grout to full saturation using gravitational pressure and b.3) Seal the nozzle loation from the top by providing and applying Dr. Fixit HB Mortar /	Sqm	10.15		Technical Specification for Civil WorkAs attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	Hydroblok300 non-shrink polymer mortar, curing etc. complete.- Treatment around pipe entry / exit locations from internal side: 1) Providing and applying Dr. Fixit Bathseal Tape or equivalent around the pipe periphery within the cut outs section of the slab, 2) Providing and applying Dr. Fixit Bathseal grout or equivalent non-shrink, free flow, high strength cementitious grout material to seal the angular gap around pipe periphery and core cut in the slab and, 3) providing and applying Dr. Fixit / Bostik or equivalent PU sealant around the top periphery of pipe all as per manufacturer's recommendation. - Necessary leak test/pond test for 48 Hrs. before and after the surface preparation is mandatory for certification1) Providing and applying one coat of Dr. Fixit Torchshield Primer or equivalent at a rate of 3-5 Sqm / litre / coat, 2) Providing and applying Dr. Fixit Torchshield APP membrane being fixed heat welding by keeping 100 mm overlap at longitudinal joints and 150 mm at transverse jointsAll work shall be carried out by the approved applicator and completely in accordance with the manufacturer's specifications.				
154	**WATER PROOFING TREATMENT FOR TOILET/BATHROOM - SUNKEN SLAB**Flexible and elastic polymer modified cementitious coating. 1)Surface Preparation: Minor cleaning work, scarifying the surface to remove laitance, cleaning with compressed air, chasing open construction joints & cracks etc. to form a U shaped groove of 20mm x 20mm and filling with polymer modified mortar using URP polymer in the ratio of 1pbw polymer:10 pbw cement: 30 pbw quartz sand.2)Making of angle fillets all around the periphery of the wall with polymer modified mortar using URP in the ratio of in the ratio of 1pbw polymer:10 pbw cement: 30 pbw quartz sand.3) Providing and applying flexible and elastic, two component, polymer modified, cementitious coating system, having elongation capacity of over 100%, applied in 2 coats in the form of slurry at a total consumption of 1.5 Kg per Sq.Mt. over the RCC slab and on the retaining wall surfaces upto a height of 1.00 mtr. above F.F.L(for shower areas upto full HT), ponding the floor with water, for 3 days to test water tightness etc. complete.4)Protective plaster/base coat- Providing & Applying 12-	Sqm	10.16		Technical Specification for Civil WorkAs attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	15mm thick Protective Screed / Plaster in cement mortar of 1:4 including integral waterproofing admixture @ 100 ml per bag of cement with wattas at the junctions applied on the floor & treated vertical surfaces, broom finished/ smooth finished as directed at site, including curing & testing for watertightness for 7 days etc.complete in all aspects as directed by Engineer/Architect.The area of the floor and sides of sunken portion treated shall be considered for payment purpose.				
Paving & Floor Finishes					
155	Providing and fixing 18/20mm thick 22"x22" sized mirror polish green kotah flooring over 20mm (average) base of Cement Mortar 1:6 (1 Cement : 6 coarse sand) on new surface and jointed with flush pointing & cleaning the surface etc complete incluidng dismentalling of exiting flooring etc complete.	Smt	9.48		Technical Specification for Civil Work As attached separately
	P & L vitrified tile flooring over 20 mm (average) base of cement mortar 1:6 (1 cement: 6 coarse sand) on new surface or fixing on existing flooring by adhesive material including dismentaling of existing flooring and jointed with color cement slurry including finised with flush pointing & cleaning the surface etc. complete for DARK shade **Size: 600 mm x 1200 mm x 8 mm**				
156	Kajaria : Estoria Beige Polished OR equivalent	Smt	9.49A		Technical Specification for Civil Work As attached separately
157	P & L vitrified tile flooring over 20 mm (average) base of cement mortar 1:6 (1 cement: 6 coarse sand) on new surface or fixing on existing flooring by adhesive material including dismentaling of existing flooring and jointed with color cement slurry including finised with flush pointing & cleaning the surface etc. complete for DARK shade**Size: 1200 mm x 1200 mm x10mm** kajaria : Kashmir Marfil Polished or equivalent	Smt	9.49A		Technical Specification for Civil WorkAs attached separately(SIZE AND MODEL shall be as per item description)
	Providing and fixing vitrified tile in dedo (with or without groove) over 15 mm (average) base of cement mortar 1:3 (1 cement: 3 coarse sand) on				

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	new surface by adhesive material and jointed with color cement slurry including finised with flush pointing & cleaning the surface etc. complete for **Size: 600 mm x 1200 mm x 8 mm**				
158	**kajaria : Breccia Vatican Carving** or equivalent	Smt	9.50A		Technical Specification for Civil Work As attached separately
	Providing and fixing vitrified tile in dedo (with or without groove) over 15 mm (average) base of cement mortar 1:3 (1 cement: 3 coarse sand) on new surface by adhesive material and jointed with color cement slurry including finised with flush pointing & cleaning the surface etc. complete for **Size: 600 mm x 600 mm x 8 mm**				
159	kajaria : **Model No. 12655 or equivalent**	Smt	9.50A		Technical Specification for Civil Work As attached separately (SIZE AND MODEL shall be as per item description)
160	P/L Ceramic tiles flooring over 12mm average th. base of C.M.1:3 …. etc complete.	Smt	14.29	96+97	Read Ceramic tiles instead of White glazed tiles.
161	P/L 8mm thick White Glazed tiles in flooring over 12mm average th. base of C.M.1:3 …. etc complete.	Smt	14.29	96+97	Read 8mm White Glazed tiles instead of 6mm thick White glazed tiles.
162	P/L 8/10mm thick Vitrified Tiles in riser of step, skerting laid over 10mm average th. base of C.M.1:3 …. etc complete.	Smt	14.32	97	Read 10mm thick Vitrified tiles instead of 6mm thick White Glazed tiles
163	P/F 25mm thick double side polished hand cut Green Kotah stone Partition for Cupboards / store racks / urinal….. etc complete.	Smt	SPECIFICATION - 3		Technical Specification for Civil Work As attached separately Item should be carried out as per detailed drawing.

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
164	Providing & laying kitchen & pantry Platform with machine cut 18mm thick single side Granite stone (sandwich type)…. etc complete.	Smt	SPECIFICATION - 4		Technical Specification for Civil Work As attached separately Item should be carried out as per detailed drawing.
165	Providing & fixing Gray Granite stone at window sill, jams & sofit…. etc complete as directed by EIC.	Smt	**SPECIFICATION - 8**		Technical Specification for Civil Work As attached separately Item should be carried out as per detailed drawing.
166	Providing and laying broken china mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar creme out upto surface using white cement including rounding off junctions and extending them upto 15 cm along the wall,clearing with water and oxalic acid etc. as directed.	Smt	9.55		Technical Specification for Civil Work As attached separately
	Providing and grouting grooves with epoxy grout in floor or dado of any size with PVC spacer and matching colour epoxy grout of BAL or equivalent of approved shade. Rate shall be inclusive of cleaning the grooves, protecting the edges before filling, and cleaning the tiles on completion etc. all complete as per detailed specifications and instructions of Engineer in charge.				
167	Grooves of size up to 3mm x 5mm (ONLY FOR VITRIFIED DADO ITEM)	Rmt	9.57		Technical Specification for Civil Work As attached separately
168	P/A Cement VATA (10cm x 10cm size) quarter round in C.M. 1:1…. etc complete.	Rmt	17.0.0.1	124	
169	Granite Flooring: For DadoProviding & laying approved quality mirror finished granite of approved shade, thickness 20 to 25 mm., in skirting, riser and dado in required sizes and shapes, including average 10 mm thick cement mortar bedding in 1:1 (1 cement: 1 fine sand) laid and jointed with white cement and matching pigment including rubbing, re-polishing after fixing to remove any undulation between the joints (if required) with	Smt	14.44, Except that stone shall be granite instead of Kota stone as approved by architect/engineer in charge	99	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	different grades of Emery, refilling of open joints, curing, daily cleaning and mopping, shall be done up to the satisfaction of the EIC (Only finished work will be measured.) etc. all complete as per approved sample by Architect, drawings and instruction of EIC. at all floors / all levels / all heights and all shapes. The rate includes machine cut edges of uniform thickness, beveling and mirror polishing of edges.Granite stone slab colour black, Cherry/Ruby red				
170	Providing & laying **Sandwich platform** of maximum 700mm width a) Sandwich type platform of top stone as 20 mm (+/- 2 mm) thick Granite of approved shade and sample and bottom stone as 25 mm (+/- 5 mm) thick single side polished kota stone with 25 mm thick screed of cement mortar 1:4 alongwith approved adhesive of BAL or equivalent in between two stones. The stone shall be fixed by chasing in to the wall surface and providing necessary MS supports of 50 x 50 x 6mm Angle or "T" (hot dip galvanised) and embedded in between the two stones etc as per the drawing / specification and / or as instructed of EIC complete and b) 75 mm raised platform (Otli) at floor level with polished kota laid on 50mm screed of (1:2:4) and skirting of kota stone as per design and approved sample. The rate includes rounding, champhering and mirror polishing of edges, facias of granite, MS supports, all material labour and wastage, as per drawing, including necessary bonding adhesive (if required) of Araldite or equivalent. Rate shall be also inclusive of making holes & cutouts for SS sink, Oval wash basin, Piller tap / Bib tap etc. as directed by engineer in charge. (Only finished single side granite work shall be measured & paid for).	Smt	9.84		Technical Specification for Civil Work As attached separately
	Ceiling & Lining				
171	Providing and fixing eco-friendly light weight calcium silicate false ceiling tiles having Tegular edge & 15 mm Thick Densified edges on the Tile Periphery for Extra Strength The Light weight calcium silicate ceiling tiles shall have, light reflection 85% non-combustible as per B.S. 476 part IV, 100% humidity resistance and also having thermal conductivity0.043° w/m	Smt	11.10		Technical Specification for Civil Work As attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	KC. for the best thermal Insulation. The Light weight calcium Silicate tile shall be of approved texture Fine fissured/Spintone/Cosmos having NRC value of 0.5 & Globe having NRC value of 0.75 NRC or equivalent of size 595 X 595 mm to be laid on true horizontal level suspended inter locking metal grid of hot dipped galvanized steel sections (galvanizing @120 grams per sqm including both side) consisting of main 'T' runner suitably spaced at joints to get required length and size of 24X38mm made from 0.30 mm thick (minimum) sheet, 1200mm centre to centre, and cross 'T' of size 24X28mm made out of 0.33mm (Minimum) sheet spaced 1200mm along spaced between main 'T' at 600mm centre to centre to form agrid of 1200X600mm and secondary cross 'T' of length 600mm and size 24x28mm made of 0.30 mm thick (Minimum) sheet to be interlocked at middle of the 1200X600mm panel to form grid of size 600X600mm resting on periphery walls/partitions on a perimeter wall angle precoated steel of size (24X24X3000 mm made of 0.40mm thick (minimum) sheet with the help of rawl plugs at 450mm centre to centre with 25mm long dry wall screws @ 230mm interval and laying 15mm thick Densified edges light weight calcium silicate ceiling tiles of approved texture (Fine Fissured/Cosmos/Spintone) in the grid including, cutting /making opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc., wherever required, Main 'T' runners to be suspended from ceiling using G.I. slotted cleats of size 25X35X1.6mm fixed to ceiling with 12.5mm dia and 50mm long dash fasteners, 4mm G.I. adjustable rods with galvanized steel level clips of size 85X30X0.8mm, spaced at 1200mm centre to centre long main 'T' bottom exposed with 24mm of all T-sections shall be pre-painted with polyester baked paint, for all heights, as per specifications, drawings and as directed by engineer-in-charge.Note:- Only calcium silicate false ceiling area will be measured from wall to wall. No deduction shall be made for exposed frames/opening (cut outs) having area less than 0.30 sqm. The calcium silicate ceiling tiles shall have NRC. Value of 0.50 (Minimum) for Fine fissured/Spintone/Cosmos and 0.75 NRC for Globe, light reflection 85% non-combustible as per B.S. 476 part IV, 100%				

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	humidity resistance and also having thermal conductivity. 0.043° w/m KC.for the best thermal Insulation				
	Plastering and Pointing				
	Providing 10mm thick cement plaster in single coat to ceilings and soffits of stair for interior plastering upto floor two level and finished even and smooth in Cement mortar 1:3 (1-cement: 3-sand) including scaffolding and curing etc complete.				
172	Up to floor two level (Ground Floor)	Sqm	17.58. (II) + 17.91	120 + 121	
173	Above Floor two level to floor three level (1st Floor)	Sqm	17.58. (II) + 17.91	120 + 121	
174	Above Floor three level to floor four level (2nd Floor)	Sqm	17.58. (II) + 17.91 +17.94(1)	120 + 121 +121	
175	Above Floor four level to floor five level (3rd Floor)	Sqm	17.58. (II) + 17.91 +17.94(1)	120 + 121 +121	
176	Above Floor five level to floor six level (4TH Floor)	Sqm	17.58. (II) + 17.91 +17.94(1)	120 + 121 +121	
178	Above Floor seven level to floor eight level (5th Floor)	Sqm	17.58. (II) + 17.91 +17.94(1)	120 + 121 +121	
179	Above Floor eight level to floor nine level (6th Floor)	Sqm	17.58. (II) + 17.91 +17.94(1)	120 + 121 +121	
180	Above Floor nine level to floor ten level (7th Floor)	Sqm	17.58. (II) + 17.91 +17.94(1)	120 + 121 +121	
181	Above Floor ten level to floor elevan level (8th Floor)	Sqm	17.58. (II) + 17.91 +17.94(1)	120 + 121 +121	
182	P/A 15mm thick Ineternal Cement Plaster on wall surface in C.M. 1:4 above P.L. to floor Two lvl…. etc complete.	Sqm	17.58(II)+17.69	120+121	
183	P/A 15mm thick Ineternal Cement Plaster on wall surface in C.M. 1:4 from floor Two lvl. to floor Three lvl…. etc complete.	Sqm	17.58(II)+17.69+17.94(I)+ 17.94(III)	120+121+12 2 +122	
184	P/A 15mm thick Internal Cement Plaster on ceilling surface in C.M. 1:4 for above P.L. to floor Two lvl…. etc complete.	Sqm	17.58(II)+17.69 +17.91	120+121+12 1	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
185	Providing and Applying 20mm thick sand faced cement plaster using wooden gutkhi on walls upto all height consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1sand) including scaffolding , curring and providing and fixing 100 mm to 150 mm wide strip of chicken net at vertical and horizontal jionts of rcc and mesonary etc complete as directed by EIC.	Sqm	17.61.(I)	120	
186	Providing and applying 20 mm thick double coat mala cement plaster on interior and/or exterior brick / concrete work for plastering comprising of base coat of 12 mm thick cement plaster in cement mortar (1 Cement : 4 coarse sand) in rough finishing and 8 mm thick top coat of cement mortar 1:2 (1 Cement : 2 Coarse sand) finished with trovel including) including scaffolding , curring and providing and fixing 100 mm to 150 mm wide strip of chicken net at vertical and horizontal jionts of rcc and mesonary etc complete as directed by EIC.	Sqm	11.28		Technical Specification for Civil Work As attached separately
187	Providing and applying average 2 mm. thick exterior/interior wall texture paint (apex duracast) by trowel in single coat including making grooves as approved pattern on already plastered walls with exterior primer followed with 2 to 3 coats of weather proof exterior emulsion paint at all floors, at any height and finished even including scaffolding, curing, making grooves (if required any) etc. complete as per drawing / specifications and / or as directed by the Engineer-in-charge. The rate shall be inclusive of exterior primer, forming grooves, exterior texture and exterior emulsion paint.	Sqm	11.38		Technical Specification for Civil Work As attached separately
188	Providing and applying concrete stamping on exterior face of the structure as per sample approved by the architect and/or engineer - in - charge including cleaning and brushing the surface, providing requisite base coat and top coat as per the requirement of the design, cleaning the surface and making good and finishing with weatherproof coat etc. complete with all necessary material, labour, tools, tackles, hardware, accessories, scaffolding etc. all to the satisfaction of the architect and/or engineer - in - charge. The rate shall be for a complete item and applying at all heights, all floors and all levels	Sqm	11.40		Technical Specification for Civil Work As attached separately

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
	a) Luxture "Decorcem" - Exposed Concrete Finish				
189	Providing and applying brick stamping on exterior face of the structure as per sample approved by the architect and/or engineer - in - charge including cleaning and brushing the surface, providing requisite base coat and top coat as per the requirement of the design, cleaning the surface and making good and finishing with weatherproof coat etc. complete with all necessary material, labour, tools, tackles, hardware, accessories, scaffolding etc. all to the satisfaction of the architect and/or engineer - in - charge. The rate shall be for a complete item and applying at all heights, all floors and all levels a) Luxture "Decorcem" - Exposed BRick Finish	Sqm	11.40		Technical Specification for Civil Work As attached separately
190	Providing and fixing freeform average 10 mm thick stoncrete plaster of vyara or quivalent completely as per manufacturer's specifications and by the approved installer of the manufacturer in accordance to the design, drawings, specifications and as per sample approved by the architect. The rate shall be for a complete item including all necessary material, labour, tools, tackles, hardware, taxes etc. complete.	Sqm	11.41		Technical Specification for Civil Work As attached separately
191	Providing and fixing dry cladding upto 10 metre heights with 30mm thick gang saw cut stone with (machine cut edges) of uniform colour andsize upto 1mx1m, fixed to structural steel frame work and/ or with the help of cramps, pins etc. and sealing the joints with approved weather sealant as per Architectural drawing and direction of Engineer-in-charge. (The steel frame work, stainless steel cramps and pins etc. shall be paid for separately). **White sand stone - 30mm thick gang saw cut stone**	Sqm	8.12	323	CPWD SPECIFICATION VOL 1
192	Providing and fixing adjustable stainless steel cramps of approved quality, required shape and size, adjustable with stainless steel nuts, bolts and washer (total weight not less than 260 gms), for dry stone cladding fixed on frame work at suitable location, including making necessary recesses in stone slab, drilling required holes etc complete as per direction of the Engineer-in-charge.	No.	8.13	324	CPWD SPECIFICATION VOL 1

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
Painting and Polishing, White Washing, Colour Washing, Distempering & Other Finishing					
193	Providing, applying, and Finishing wall with 2 coat of asian, apex ultima paint / berger weather proof exterior emulsion paint on wall surface including to give an required shape even shade over primer of asian / berger after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete	Sqm	13.34		Technical Specification for Civil Work As attached separately
194	Washable INTERNAL 100% Acrylic paint: Providing and applying Easy clean, Washable INTERNAL 100% Acrylic paint (Premium Plastic Paint) - approved make like premium emulsion of asian - Royale luxury , color & shade in three coats (first one coat Asian Royale wall base coat with brush and final two coats with roller), on newly dry interior plastered surface at all heights, all floors, all levels complete to give an even shade, including required coats (minimum two coats) white cement based putty of Birla white / Acrylic putty of Asian paint or equivalent after thoroughly brushing the surfaces free from mortar dropping and other foreign matter and also including preparing the surface even and sand papered smooth etc. after applying every coat of putty. Priming coat of alkali resistant cement primer (water or solvent based) is to be applied before commencement of painting etc. complete as directed by engineer-in-charge. Sample to be approved by Architect and Engineer in charge before starting of the work. The rates shall include the cost of filler for filling the cracks on surface.	Sqm	13.39		Technical Specification for Civil Work As attached separately
195	Applying White washing with lime on wall surface (Three coats)…etc complete.	SQM	18.11+18.13	125+126+ 126+127	
196	Applying White washing with lime on ceilling surface (Three coats)…etc complete.	SQM	18.11+18.13+18.14+18.16	125+126+ 126+127+ 127+ 127	

SR. NO.	ITEM DESCRIPTION	UNIT	GTS /EXTRA SPECS ITEM NO.	PAGE NO.	R&B BUILDING SPECIFICATION BOOKLET / ANY OTHER REMARKS
197	Providing and fixing PVC water tank (Sintex) readymade one piece moulded water tank antibecterial type ….etc complete	nos	SPECIFICATION - 17		Technical Specification for Civil Work As attached separately
198	Carring out plinth treatment to post construction/existing structure by spraying chemical solution for termite control treatment including labour and material consistant with I.S.I. specification. Using Chlordene and chiorpurfiles 20 EC. as per 6131_paret-II consentration weight one percent is recommended i.e. one litre 20 EC chemical emulsion with 19 litre give 1% concentration inclusive of one litre chemical emulsion appiciation at the rate of 5 Litre chemical / Sq.m of surface is recommended as per I.S. etc. complete as directed by EIC.		22.00.7	156	

TECHNICAL SPECIFICATION

FOR CIVIL WORKS

PROJECT: "CONSTRUCTION FOR GUJARAT NATURAL FARMING SCIENCE UNIVERSITY, AT JAMBUDI VILLAGE, TALUKA HALOL, PANCHMAHAL DISTRICT (GIRLS HOSTEL, KITCHEN & DINNING HALL, GUEST HOUSE, E-2 TYPE QUARTERS, B-TYPE QUARTERS, D-TYPE QUARTERS, B-B1 TYPE QUARTERS, SANITATAION WORK, COMPOUND WALL)"

DOCUMENT: CIVIL SPECIFICATIONS

1.01 Providing and injecting Chemical emulsion for PRE – CONSTRUCTIONAL anti-termite treatment for all types of structure with / without basement with RCC foundation/RCC wall or with load bearing walled foundation or development areas tree pits, water body etc. as per IS 6313 (Part-2)-1981 using chemicals like chloropyripos, Biflex TC, lindane etc. 20EC mixed with water in 1:19 ratio (1 liter chemical: 19 liters of water).Carrying out pre construction anti-termite treatment. A guarantee bond of 10 years shall be furnished in prescribed format on stamp paper. Rate shall be inclusive of material storage, safety and labor required for complete Anti Termite Treatment for injecting the emulsion at all stages mentioned below etc. complete all as per specification and directions of Engineer-in-charge. Plinth area of building at ground floor only shall be measured.

a) Bottom surface and the sides of the excavation made for masonry foundations at the rate of 4 liters/ of surface area (wherever applicable).

b) At the rate of 7.5 liter/ Sqm of surface area to the backfill at the depth of 500mm below the original ground level. The soil in the immediate contact with the vertical surface of RCC column shall be treated.

c) Top surface of the plinth filling at the rate of 5 liter/Sqm of internal plinth area etc. complete.

d) Internal vertical surface from original Ground level to top of the earth filled in the plinth at the rate of 7.5 liter/Sqm of surface area in contact.

e) at the rate of 7.5 liter/ Sqm to the external vertical surface below finished Ground level to the full depth of the filling complete by injecting chemical after drilling the holes of 12 to 15mm dia, with depths of 191pprox.. 300 to 600 mm and at 150mm centre to centre and as close to the wall as possible.

f) All holes for electrical data, water supply, drainage etc. shall be treated.

Material:

The chemicals used for the soil treatment shall be only one of the following, with concentration shown against each, in aqueous emulsion.
Chemical Concentration: Chloropyriphos 20% Biflex

Workmanship:
The chemical barrier shall be complete and continuous under whole of the structure to be protected.

The treatment shall be done as per the IS specifications & stages mentioned in item.

Treatment for building shall start after the excavation is complete and before lying soling or PCC. The treatment shall be carried out in the following stages:

Treatment for Masonry Foundations and Basement: The bottom surface and the sides of the excavations made for masonry foundations and basement shall be treated with the chemical at the rate of 4 litres per square meter surface area.

Backfilling in: The treatment shall start at a depth of 500 mm below the ground level except when such ground level is raised or lowered by filling or cutting after the foundations have been cast. In such cases, the depth of 500 mm shall be determined from the new soil level resulting from the filling or cutting mentioned above, and soil in immediate contact with the vertical surfaces of RCC foundations shall be treated at the rate of 7.5 litres per square meter.

Filling in stage at floor level: The top surface of the consolidated earth within plinth walls shall be treated with chemical emulsion at the rate of 5liters per square meter of the surface before the sand bed or sub grade is laid. If the filled earth has been well rammed and the surface does not allow the emulsion to seep through holes up to 50 to 75 mm deep at 150 mm centers both ways may be made with 12 mm diameter mild steel rod on the surface to facilitate saturation of the soil with the chemical emulsion.

Treatment at Junction of the Wall and the Floor Special care shall be taken to establish continuity of the vertical chemical barrier on inner wall surfaces from ground level up to the level of the filled earth surface. To achieve this a small channel 30*30 mm shall be made at the junctions of the wall made in the channel up to the ground level 150 mm apart and the iron rod moved backward and forward to break up the earth and chemical emulsion poured along the channel at the rate of 7.5 litres per square meter of the vertical wall or column surface so as to soak the soil right to the bottom. The soil should be tamped back into place after this operation.

Trench treatment after the building is complete; the earth along the external perimeter of the building should be rodded at intervals of 150 mm and to a depth of 300 mm. The rods should be moved back ward and forward parallel to the wall to break up the earth and chemical emulsion poured along the wall at the rate of 7.5 liters per square meters of vertical surfaces. After the treatment, the earth should be tempted back into place. Should the earth outside the building be graded on completion of building this treatment should be carried out on completion of such grading. In the event of filling being more than 300 mm, the external perimeter treatment shall extend to the full depth of filling up to the ground level so as to ensure continuity of the chemical barrier.

Treatment of soil surrounding pipes, wastes and conduits: The soil surrounding pipes, waste pipes and conduits in the plinth shall be loosened to facilitate the absorption of emulsion. Rodding is performed at 15cm interval and up to a depth of 30cm.

Treatment for expansion joints: The soil below the expansion joint shall be treated with emulsion at the rate of 2 litres per linear meter.

The chemical treatment shall be carried out when the surface is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil is wet with rain water or sub soil water.

Once formed, treated soil barriers shall be not disturbed. If disturbed, immediate steps shall be taken to restore the continuity and compactness of the barrier system.

Reconciliation of chemicals brought on site and used for treatment shall be submitted on completion of job.

The treatment against termite infection shall remain effective for a period not less than 5 years, from date of issue of the final certificate of completion of work. If at any time during this period, any defects in treatment are revealed or any evidence of infection in any part of the building or structure is noticed, the Contractor shall rectify the concerned defects within 15 days on receipt of notice from Engineer-in-charge. On Contractor's failure to do so, the Engineer-in-charge may get the same rectified through any other agency at the Contractor's risk and cost, and the decision of Architect or Engineer-in-charge as to the cost payable by the Contractor for the same shall be final and binding to the Contractor.

The chemical treatment shall be c'rried out when the surface is quite dry. Chemical treatment shall not be carried out when it is raining or when the soil is wet with rainwater or sub soil water.

Once formed, treated soil barriers shall be not disturbed. If disturbed, immediate steps shall be taken to restore the continuity and compactness of the barrier system.

Reconciliation of chemicals brought on site and used for treatment shall be submitted on completion of job.

The treatment against termite infection shall remain effective for a period not less than 5 years, from date of issue of the final certificate of completion of work. If at any time during this period, any defects in treatment are revealed or any evidence of infection in any part of the building or structure is noticed, the Contractor shall rectify the concerned defects within 15 days on receipt of notice from Engineer-in-charge. On Contractor's failure to do so, the Engineer-in-charge may get the same rectified through any other agency at the Contractor's risk and cost, and the decision of Architect or Engineer-in-charge as to the cost payable by the Contractor for the same shall be final and binding to the Contractor.

A guarantee bond on one hundred Rupee stamp paper shall be given by the Contractor to the Government, in the manner form described below:

This guarantee shall remain force for the period of 10 years, from the completion of the work under the contract and it shall remain binding to the Contractor for period of 10 years.

Mode of Measurements and Payment:

The plan area at ground floor (PLINTH AREA) only shall be measured and paid. No deduction shall be made nor extra paid for any opening for pipes, etc., up to 0.1 m^2.

The rate shall include the cost of all labour and materials required for the operation involved for satisfactory completion of this item. The rate shall be for a unit of one m^2.

2.05 Providing and fixing premoulded compressible filler board in black colour confirming to MoRT&H Specifications (Clause 1015), having minimum density 95kg/cum, non-staining with less than 1% water absorption & compression recovery of 93% minimum as per specification including cutting to required size and shape at all levels etc.complete as directed.

a) for 12 mm wide expansion joint

b) for 20 mm wide expansion joint

c) for 40 mm wide expansion joint

Open joints shall be constructed at the location as directed by the Engineer-in-charge using a wood strip metal (plate or other suitable material which is subsequently removed. When removing the material, care shall be exercised to avoid chipping or breaking the corners of the concrete. The edge of the concrete, at the joints, shall be well finished. Reinforcement shall not extend across an open joint.

When preformed filler is to be provided, the filler shall be placed in correct position before concrete is placed against the filler. The filler material shall from part of the joint and while concreting the slab, care shall be taken to prevent the former being displaced. After the work is completed, the exposed face of the joint shall be cleaned of all loose material sticking to it.

The material used for filling expansion joint shall be bitumen impregnated fell. Impregnate felt shall conform to the requirement of IS; 1838, and shall be got approved from the Engineer-in-charge. The joint shall consist of large pieces and assembly of small places to make up the required size shall be avoided.

The expansion joint shall be measured in Square metres. Thickness of the expansion joint will be 12 mm. width of expansion joint shall be equal to full depth of the slab.

The rate shall include the cost of all materials, labour, equipments & incidental charges for fixing the joints complete in all respects as per these specifications and as shown on the drawing.

2.06 Charges for making holes in RCC wall, slabs or any other RCC members by diamond core cutting machine of HILTI including disposing the debris. Measurement will be taken for the depth of holes in running meter. For all floors / all levels / all heights.

a) Holes from 50 mm to 80 mm dia.

b) From 100 to 160 mm dia.

c) From 160 to 225 mm dia.

Materials and Workmanship

Materials to be used for this item shall be as per standard manufacturer's specifications (as indicated in item description) as approved by Architect/Engineer in charge.

Workmanship

The work shall be carried out as per the prevailing best practices in the industry. It shall be carried out as per recommended by standard manufacturer's procedure and shall be completed to the satisfaction of engineer in charge.

Mode of Measurement and Payment

The item shall be measured and paid in Rmt. considering length of core of dia. as indicated in item description in RCC members.

2.07 Charges for making holes in Brick wall or any surface by diamond core cutting machine of HILTI including disposing the debris. Measurement will be taken for the depth of holes in running meter for all floors / all levels / all heights.

a) Holes up to 100 mm dia
b) From 101 to 150 mm dia
c) From 151 to 300 mm dia

Materials and Workmanship

Materials to be used for this item shall be as per standard manufacturer's specifications (as indicated in item description) as approved by Architect/Engineer in charge.

Workmanship

The work shall be carried out as per the prevailing best practices in the industry. It shall be carried out as per recommended by standard manufacturer's procedure and shall be completed to the satisfaction of engineer in charge.

Mode of Measurement and Payment

The item shall be measured and paid in Rmt. considering length of core of dia. as indicated in item description in brick/block masonry walls.

2.09 Providing in position PVC sleeves of 6kg/cm2 UPVC pipes of following diameters for taking out service pipelines, cables etc. in slabs, beams, brickwork as per drawing in required level and gradient for all floors / all levels / all heights.

a) 50 mm dia.
b) 75 mm dia.
c) 110 mm dia.
d) 160 mm dia.
e) 225 mm dia.

Materials

Materials to be used for this item shall be as indicated in item description adhering to relevant Indian standard and as approved by Architect/Engineer in charge.

Workmanship

The work shall be carried out as per the prevailing best practices in the industry. It shall be carried out as per recommended by standard manufacturer's procedure.

Mode of Measurement and Payment

The item shall be measured and paid in Rmt. considering length of pipe.

6.06 For Door HEight of 2.4 m:
Providing & fixing in position door frame of size 125 mm x 65 mm as per drawing made from best quality selected well seasoned Indian Teak wood including making rebate, smoothening, sand papering, making the edges rounded, fixing the same using appropriate anchor fasteners of Hilti or equivalent viz HRD C 10x120/50 – 3 numbers in each vertical and 2 numbers in

horizontal frame member including applying tar or black japan paint to outer surface contected to masonary or RCC and lacquer polishing to wooden surfaces as per drawing, design & direction, sample to be got approved by Architect / Engineer-in-charge etc complete. Including necessary IS 710 ply /teak rough ground/packing, filling the teak wood patti on either side all around the frame. Backer-rod, neutral cure G/M silicon sealant, anchor fastener, screws, fevicol, araldite, nails etc complete. Including providing and fixing 35 mm thick solid core flush type door as per IS 2202 (part 1) (non decorative) of approved manufacturer. Battens should be chemically treated & kiln seasoned & binding agent should be phenol formaldehyde and of required size, as per approved drawing, designs and direction. Including external lipping of 10 mm thickness of seasoned teak wood equivalent to best quality indian teak all around all edge as per approved drawing, design & direction etc complete, sample must be got approved by the Architect or Engineer-in-charge. (Necessary hardware like hinges, pivot, handle, tower bolts, locks etc. shall be measured separately and paid in the relevant tender items.) The flush shutter shall also be finished on either side with 1 mm thick Laminate sheet Decowalnut Lightbrown of Century ply or equivalent with necessary nails, screws, adhesives, 10 mm thick best quality ghana teak lipping patti for hinge or pivoted shutter as per drawings and approved sample. Laminate shall be either glossy or Swede finish as decided by EIC. The rate shall be inclusive of lacquer polishing on the lipping and for all heights, all floors, all places, etc. complete. The fix panel above shall be provided with 5 mm thick clear float glass being fixed with necessary bidding. The frame fix panel portion shall be provided with 12 mm thick solid round MS bars being finished as per detail drawing including primer coat of red oxide and approved quality enamel paint for security etc. complete.

All relevant specifications for material and workmanship shall be followed of this document item no. 6.02, 6.03 & 6.05 and the work shall be carried out as per item description, design, drawings and sample approved by the architect and/or engineer-in-charge. The rate shall be for a complete item as per item description, design, drawings inclusive of all necessary material, labour, tools, tackles, consumables etc. all applicable for satisfactory completion of the work.

Mode of Measurement & Payment:

The item shall be measured and paid for a unit of one sqm of clear opening dimension after finishing with plaster.

6.07 Foor Door Height of 2.1 m:

Providing & fixing in position door frame of size 125 mm x 65 mm as per drawing made from best quality selected well seasoned Indian Teak wood including making rebate, smoothening, sand papering, making the edges rounded, fixing the same using appropriate anchor fasteners of Hilti or equivalent viz HRD C 10x120/50 – 3 numbers in each vertical and 2 numbers in horizontal frame member including applying tar or black japan paint to outer surface contected to masonary or RCC and lacquer polishing to wooden surfaces as per drawing, design & direction, sample to be got approved by Architect / Engineer-in-charge etc complete. Including necessary IS 710 ply /teak rough ground/packing, filling the teak wood patti on either side all around the frame. Backer-rod, neutral cure G/M silicon sealant, anchor fastener, screws, fevicol, araldite, nails etc complete. Including providing and fixing 35 mm thick solid core flush type door as per IS 2202 (part 1) (non decorative) of approved manufacturer. Battens should be chemically treated & kiln seasoned & binding agent should be phenol formaldehyde and of required size, as per approved drawing, designs and direction. Including external lipping of 10

mm thickness of seasoned teak wood equivalent to best quality indian teak all around all edge as per approved drawing, design & direction etc complete, sample must be got approved by the Architect or Engineer-in-charge. (Necessary hardware like hinges, pivot, handle, tower bolts, locks etc. shall be measured separately and paid in the relevant tender items.) The flush shutter shall also be finished on either side with 1 mm thick Laminate sheet Decowalnut Lightbrown of Century ply or equivalent with necessary nails, screws, adhesives, 10 mm thick best quality ghana teak lipping patti for hinge or pivoted shutter as per drawings and approved sample. Laminate shall be either glossy or Swede finish as decided by EIC. The rate shall be inclusive of lacquer polishing on the lipping and for all heights, all floors, all places, etc. complete.

All relevant specifications for material and workmanship shall be followed of this document item no. 6.02, 6.03 & 6.05 and the work shall be carried out as per item description, design, drawings and sample approved by the architect and/or engineer-in-charge. The rate shall be for a complete item as per item description, design, drawings inclusive of all necessary material, labour, tools, tackles, consumables etc. all applicable for satisfactory completion of the work.

Mode of Measurement & Payment:

The item shall be measured and paid for a unit of one sqm of clear opening dimension after finishing with plaster.

6.08a Providing & fixing butt hinge of specific size of specified SS grade brush finish with necessary screws etc. complete of specified make and sample as approved by Architect and Engineer in Charge.
a) 102 x 76 x 3 mm - SS 304 grade of KICH model no. PRBHB34S

Material:

The material shall be of best quality as mentioned in item description and shall be got approved by architect/engineer in charge prior to its use.

Workmanship:

The item shall be operated as per drawing, manufacturer's specifications and best practices prevailing in the industry with all necessary tools, tackles and equipments to the satisfaction of architect/engineer in charge.

Mode of Measurement and Payment:

The item shall be measured and paid for a unit of nos. installed.

6.09 Providing & fixing Mortise lock (9"body) with 60 mm Europrofile Pin Cylider of KICH model no. PRPCKNS60/PRML9BS with both side key /one side key -one side knob with one pair of rose for wooden /aluminum doors with necessary ss phillips head screws etc .complete as per drawing and sample approved by Architect /EIC .Rate shall be for all heights ,all floors and all places. KICH

Material:

The material shall be of best quality as mentioned in item description and shall be got approved by architect/engineer in charge prior to its use.

Workmanship:

The item shall be operated as per drawing, manufacturer's specifications and best practices prevailing in the industry with all necessary tools, tackles and equipments to the satisfaction of architect/engineer in charge.

Mode of Measurement and Payment:

The item shall be measured and paid for a unit of nos. installed.

6.10 Providing & fixing 19 mm diameter SS 316 satin (brush) finish Mortise handle in pair of KICH (MH193)with necessary SS phillips headscrews etc. complete, as per drawing as approved by Architect and Engineer-in-charge. Rate shall be for all heights ,all floors and all places .

Material:

The material shall be of best quality as mentioned in item description and shall be got approved by architect/engineer in charge prior to its use.

Workmanship:

The item shall be operated as per drawing, manufacturer's specifications and best practices prevailing in the industry with all necessary tools, tackles and equipments to the satisfaction of architect/engineer in charge.

Mode of Measurement and Payment:

The item shall be measured and paid for a unit of pair installed.

6.18 Providing and fixing DOOR CLOSER (IN SLIVER) of KICH model no. DC511S with necessary screws, pins, bolts etc. complete as approved by Engineer in Charge.

Material:

The material shall be of best quality as mentioned in item description and shall be got approved by architect/engineer in charge prior to its use.

Workmanship:

The item shall be operated as per drawing, manufacturer's specifications and best practices prevailing in the industry with all necessary tools, tackles and equipments to the satisfaction of architect/engineer in charge.

Mode of Measurement and Payment:

The item shall be measured and paid for a unit of nos. installed.

6.20a Providing & fixing satin finish D shape push-pull handles in pair of with necessary screws etc. complete, as per drawing as approved by Architect and Engineer-in-charge.Rate shall be for all heights ,all floors and all places.
a) SS - 304 - 25 mm dia x 450 mm long; Kich Model No. PRDH2518S

6.20b a) SS - 304 - 19 mm dia x 250 mm long; Kich Model No. PRDH1910S

6.20c a) SS - 304 - 2 mm dia x 150 mm long; Kich Model No. PRCH426C

Material:

The material shall be of best quality as mentioned in item description and shall be got approved by architect/engineer in charge prior to its use.

Workmanship:

The item shall be operated as per drawing, manufacturer's specifications and best practices prevailing in the industry with all necessary tools, tackles and equipments to the satisfaction of architect/engineer in charge.

Mode of Measurement and Payment:

The item shall be measured and paid for a unit of a pair. installed.

7.28 Providing and fixing standared extruded of alluminium section of size 63mm x 38.10mm x 1.2mm, @ Wt. 0.643 Kg/mt with colour Powder Coated alluminium frame for ventilation with 5 mm thick frosted glass as details etc complete for Ventilation.

Material and workmanship:

The relevant specifications of item no. 7.25 shall be followed.

Mode of Measurement and Payment:

The height and width of door/window/ventilators as fixed in place shall be measured correct to one centimetre and area calculated in sqm. correct to second place of decimal shall be taken for payment.

The rate shall be for providing aluminium fixed windows / doors / ventilators with all necessary materials, fitting and fixtures, labour for fixing in position, bearing concern of brick masonry to fixing frame of windows & making good the same. The rate shall be inclusive of providing and fixing all necessary fitting and fixtures.

The item shall be measured and paid for a unit of one sqm.

7.33a Providing and fixing in position frames for aluminium door / composite door-window / window / casement window and aluminium door shutters (sliding / side hung/ pivote) window shutters (sliding / fixed / openable - casement) as per approved shop drawings (Shop drawings to be prepared by the contractor and to be approved by the Client and Consultant) and aluminum sections of approved make like Jindal or equivalent having Anodizing finish with anodised transparent or dyed to required shade according to IS: 1868, Minimum anodic coating of grade AC25 for non exposed side of approved shade sections all floors / all levels / all heights / all shapes and for all sizes as per the drawing, specification or as directed by Architect or Engineer - in - Charge .

Rate shall be inclusive of providing aluminium sections (DOMAL or Euro-profile), cutting, fabrication, errection and fixing to the best workmanship manner, including

1) Sheet metal screws and aluminium angle corner cleat of minimum 3mm thickness and of full width etc for assembling the frame and shutter; 2) Glazing clips for receiving infill panel; 3) Best quality wool pile where ever shutter touches the frame and EPDM rubber; 4) Anchor fasteners of HILTI HRDUGT or equivalent for fixing the frame assembly to the RCC or masonry surfaces. Minimum 1 anchor fastener shall be used for every 750mm length of section for stability of frame.

5) 10mm GI tie rod for connecting vertical stile at top and bottom.

Work shall have to be carried out as per the approved shop drawings and approved sample. Actual weight of installed Aluminium sections which are visible shall only be measured and shall be considered for the payment. Infill panels shall be paid in relevant tender items.

All relevant specifications of CPWD specification section no. 21 shall be followed. In addition to that, the work shall be carried out completely in accordance to the item description and sample approved by the Architect and/or Engineer-in-Charge.

The architect shall provide intent drawings to be contractor. Based on the intent drawings, the contractor shall submit detailed shop drawings and one (1:1) scale sample for each opening type for approval by the Architect and/or Engineer-in-Charge. Only upon securing approval of shop drawings and samples the mass work for rest of the openings shall be carried out.

Mode of Measurement and Payment:

Rate shall be inclusive of providing aluminium sections (DOMAL or Euro-profile), cutting, fabrication, erecting and fixing to the best workmanship manner, including

1) Sheet metal screws and aluminium angle corner cleat of minimum 3mm thickness and of full width etc for assembling the frame and shutter; 2) Glazing clips for receiving infill panel; 3) Best quality wool pile where ever shutter touches the frame and EPDM rubber; 4) Anchor fasteners of HILTI HRDUGT or equivalent for fixing the frame assembly to the RCC or masonry surfaces. Minimum 1 anchor fastener shall be used for every 750mm length of section for stability of frame. 5) 10mm GI tie rod for connecting vertical stile at top and bottom.

The item shall be measured and paid for a unit of one kg.

Based on the approved shop drawings and sample, the actual Rmt of various sections shall be calculated along the outer periphery of the composite section correct to a millimetre. The weight calculated on the basis of actual average (average of five samples) weight of composite section in kilogram correct to the second place of decimal shall be taken for payment. (Weight shall be taken after anodizing). The weight of cleat shall be added for payment. Neither any deduction nor anything extra shall be paid for skew cuts. In case of difference between the actual weight of the section and theoretical weight of the section being more than 5%, the lower value of weight between the two shall be considered for payment. The decision of Engineer-in-Charge in this regard shall be final and binding.

7.34 Clear Float Glass:

Providing and fixing clear float glass of specified thickness in frame work, shelves with necessary cutting of glass as per drawing & specifications including providing and fixing EPDM quality rubber for aluminum sections / filling transparent neutral cure glazed & metal silicon sealant of approved make on the periphery of the glass & wood etc. complete at all floors, all levels, all hights and in all shapes as per the directions of Architect/Engineer-in-charge. Rate shall be inclusive of glass finshing, consumable hardware, tools, tackles etc. Actual installed area of glass shall be measured and paid in sqm.

a) 6 mm thick

Material:

The glass shall be from approved manufacturer and as per sample approved by the architect and/or EIC and of thickness as specified in the item description.

he float glass shall conform to the IS 14900.

Thickness: The thickness of float glass shall be as defined in item description. The tolerance in thickness shall be as under:

Normal Thickness (in mm)	Tolerance (in mm)
4.0	+/- 0.3
5.0	+/- 0.3
6.0	+/- 0.3
8.0	+/- 0.3

Allowable Defects:
The allowable defects shall be as per Table below:

Sr. No.	Defects	Central	Outer	Remarks
1	Gaseous inclusion. Max size, mm	3.0	6.0	Separated by at least 30.0 cm
2	Opaque gaseous inclusion. Max size. mm	3.0	6.0	Separated by at least 60.0 cm
3	Knots, dirt and stones, Max size. mm	1.0	1.0	Separated by at least 30.0 cm
4	Scratches, Rubs and Crush	Faint	Light	Separated by at least 30.0 cm
5	Bow, percent. Max	0.5	0.5	As per below details
6	Reams, Strings and lines	Light	Light	As per below details
7	Waviness	Nil	Nil	As per below details
8	Sulphur stains	Nil	Nil	
9	Corner breakage and chip	Not more than nominal thickness of Float glass		

Allowable Cluster of Defects:
The allowable cluster of defects mentioned under Sl. No. 1, 2 & 3 of above Table shall be as per IS 14900.

Tests
Thickness:
The thickness of float glass shall be measured with micrometers or a caliper which is graduated to 0.01 mm or with a measuring instrument having an equivalent capacity.

Scratches, Rubs and Crush:
Place the sample of float glass in a vertical position approximately 50 cm from the viewer's position and look through it using either day light without direct sunlight or a background light suitable for observing each type of defect.

Intensity of Scratches, Rubs, Crush	Intensity Distance Limit
Faint	Shall not be detectable beyond 50 cm
Light	Detectable between 50-100 cm and not beyond 100 cm

Bow:
Depending on the side on which bow is present, stand the sample vertically on a wooden plank. Stretch a thread edge to edge. Measure the longest perpendicular Distance from the thread to

Intensity of Reams, Strings and Lines	Intensity Distance Limit
Light	7.5 cm
Medium	5.0 cm
Heavy	2.5 cm

the surface of float glass facing the thread and express it as percentage of the length of float glass from edge along the thread.

Reams, Strings and Lines:

Focus a light projector with a 500 W lamp and an objective lens with an approximate 5 cm aperture and about 30 cm focal length on a flat white projection screen placed about 760 cm from the light source in a dark room. Place the float glass in a vertical position parallel to the screen between the light and the screen. Move the glass slowly towards the screen with a vertical oscillating motion. The shadowgraph read out is the distance at which the distortion just blends with the general shadow of the glass on the screen.

Perspective Distortion:

When tested as per test procedure described below it shall not give distorted vision of straight stripe pattern.

Test Procedure for Perspective Distortion

Perspective distortion shall be examined by looking through the specimen glass which may be placed at about 4.5 m distance in such a direction that the incident angle to it is 50 degree (4 mm or above) and by observing a screen set up perpendicularly to the line of vision about 4.5 m further ahead of the specimen over the total width of about middle part of the specimen from the horizontal direction. The specimen glass shall be kept with the drawn direction at manufacture vertical and, on the surface of the screen, the strip pattern of white and black parallel straight lines of 25 mm width and inclined 45 degrees from the vertical shall be provided and its surface shall be luster less.

Workmanship:

The glass shall be erected in the framework with utmost care and precautions so that the glass is not damaged. Once the glass is put in position, the free half of the framework shall be secured in position. Thereafter, silicon sealant of approved make and shade shall be injected in the cavity to fill the voids between the glass and the framework. In case EPDM rubber is to be used, the glass periphery shall be bevelled and EPDM rubber shall be fixed on the periphery of the glass prior to erecting it in position in the framework.

Mode of measurement & Payment:

The finished final length/ height and width of the glass should be measured correct to two places of decimal and overall area in sqm correct to two places of decimal should be calculated for payment.

The rate shall include the cost of all the materials, labours involved in all the operations above and as described in the nomenclature of item and particular specification.

7.35 Providing & fixing 110 cm high stainless steel railing made from anti corrosive 304 grade s.s. Pipe of 50 mm dia (16 gauge) as hand rail with s.s. 304 grade baluster as a vertical support fixed in RCC slab at 1.66 mt c/c including three horizontal s.s. Pipe of 20 mm dia (16 gauge) at equal distance connected with balusters including accessories as per detailed drawing as a directed etc complete to the satisfaction of engineer in charge. The balustrade would be fixed onto floor with casted base plate of minimum 6mm thickness anchored down on slab with Hilti fasteners. Base plate shall be concealed with suitable S.S. cover cap so that the mounting anchor fasteners are not visible after installation. Rates should be inclusive of welding, grinding, buffing, polishing and making curvature (wherever required) fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer/Architect. For payment purpose, length of handrails will be taken (between two outer balusters) excluding the length of railing beyond balustrades

General

The stainless steel work shall be got executed through specialized fabricator as per the list of the approved agencies having experience of similar works. The Contractor shall submit the credentials of the fabricator for the approval of the Engineer.

The Contractor shall submit shop drawings, for approval of the Engineer, for fabricating stainless steel railing with detailing of M.S. stiffener frame work backing along with the fixing details of the M.S. frame work to the R.C.C columns.

The contractor shall submit 6 copies of shop drawings showing all dimensions, details of construction, installation relating to the adjoining work. The details of the joints in the stainless steel railing including location, etc. shall also be shown in the shop drawings.

The stainless steel shall be of grade S 316 with brushed steel satin finish and procured from the approved manufacturer. It shall be without any dents, waviness, scratches, stains etc.

The handrail shall be made of pipes joined together with component fittings. All components must be mechanically fastened with stainless steel hardware.

The railing shall be fixed in position using stainless steel pipes, stainless steel posts of grade SS-316 of required diameters and thickness as shown on drawing and polished to satin finish including cutting, welding, grinding, bending to required profile and shape, hoisting, butting, polishing etc.

The required joints in the railing provided as per the architectural drawings, shall be welded in a workmanlike manner including grinding, polishing, buffing, etc. all complete and compacted.

The temporary clamps provided and fixed to hold the stainless steel railing, in position shall be removed after the concrete has set properly. The junction of the flooring and the cladding shall be neatly filled with weather silicone sealant of approved colour and shade. Nothing extra shall be payable on this account.

Guardrails and Handrails shall be designed to withstand a 200lb concentrated load applied in any direction and at any point on the top rail. Intermediate railings shall be provided such that a 21-inch diameter sphere cannot pass through any opening.

The manufacturer shall submit calculations for approval at the request of the Engineer. Testing of base castings or base extrusions by an independent lab or manufacturer's lab will be an acceptable substitute for calculations. Calculations will be required for approval of all other design aspects.

Posts shall not interrupt the continuation of the top rail at any point along the railing, including corners and end terminations. The top surface of the top railing shall be smooth and shall not be interrupted by projected fittings.

The mid-rail at a corner return shall be able to withstand a 200lb load without loosening. The contractor is to determine this dimension for their system and provide physical tests from a laboratory to confirm compliance.

Concrete anchors shall be stainless steel type SS-316 and shall be furnished by the handrail manufacturer. The anchor design shall include the appropriate reduction factors for spacing and edge distances in accordance with the manufacturers published data.

One test (three specimens) for each lot shall be conducted for the stainless steel pipe in the approved laboratory. Therefore, the material shall preferably be procured in one lot from one manufacturer.

The finished surface shall be free of any defects like dents, waviness, scratches, stains etc. and shall have uniform brushed steel satin finish. Any defective work shall be rejected and redone by the Contractor at his own cost. The finished surface shall therefore be protected using protective tape which shall be removed at the time of completion of the work. The surface shall then be suitably cleaned using nonabrasive approved cleaner for the material.
Nothing extra shall be payable on this account.

The item includes the cost of all inputs of labour, materials (including stainless steel pipes, welding, brazing, concrete, protective film, weather silicone sealant, etc. including cost of providing and fixing M.S. frames), T & P other incidental charges, wastages etc. The items also included providing and fixing stainless steel anchor fasteners for fixing railing. The entire work shall be carried out to the satisfaction of Engineer.

All stainless steel members, pipes, balusters, handrails, etc. shall confirm to IS 6603 (2001) and relevant Indian standards and shall be of premium quality. SS railing and toughened glass of approved make and design shall be supplied for installation with height and width as per approved drawings.

The railings shall be fabricated to the design and pattern shown in the drawings. All joints shall be made in best workman like manner with slotting and welding as required to the specified size and shape. The edge of the M.S. flats shall be suitably metered before welding to get the desired

shape. The joints shall be filled to remove excess stay after welding screws, nuts, washers, bolts, rivets and any other miscellaneous fastenings devices shall be of steel and shall be provided by the contractor. Any undulations, bends etc. found shall be rectified by the contractor at his own cost. The complete assembly of rill/railing so fixed shall be firm and there shall not be any lateral movements.

The Contractor shall procure and submit to the Engineer, samples of various materials for the railing work, for approval. After approval of samples, the Contractor shall prepare a mock up for approval of Engineer/Consultant. The material shall be procured and the mass work taken up only after the approval of the mock up by the Engineer/Consultant. The mock-up shall be dismantled and removed by the contractor as per the directions of the Engineer. Nothing extra shall be payable on this account.

The approved railings shall be fixed in position where specified and shown in drawings including in masonry walls, teakwood frames, hand railings etc. Any damages to walls, frames etc. caused during fixing the railings shall be made good by grouting with cement mortar/packing/repairing properly at the contractors cost.

Material:
Knock down railing system shall consist of following components:
SS 316 Handrail - 50mm dia.
SS 316 Balusters - 50 mm dia fixed @1200mm c/c.
SS 316 Mid-rails- 16mm dia (03 nos)
Stainless steel anchor fasteners for fixing railing.
Fixing elements, brackets, SS caps etc.

Application: Railing system is to be fixed with knock down railing system. Handrail will be 50mm dia, baluster will be round 50mm dia fixed at a maximum spacing of 1200mm c/c, midrails of 16mm dia. (3nos) fixed with suitable fixtures on locations as per approved drawings and as per instructions of Architect/Engineer. The balustrade would be fixed onto floor with casted base plate of minimum 6mm thickness anchored down on slab with SS fasteners. Base plate shall be concealed with suitable S. S. cover cap so that the mounting anchor fasteners are not visible after installation. Wall thickness of all pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Railing height to be taken as 1000mm from finished floor level.

Mode of measurement & Payment: Hand railing shall be measured for payment in running meter. The lengths shall be measured along the top center line of the hand rail and shall be measured between ends of balusters, newels, posts as the case may be up to two places of decimals of a meter.

Rates should be inclusive of welding, grinding, buffing, polishing and making curvature (wherever required) fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement.

7.36 Providing and fixing in position SS 304-15mesh x27 gauge Mosquito net for aluminium sliding shutter / fixed shutter or in front of aluminium louvers as per approved shop drawing and sample as approved by Architect or Engineer-in-charge, at all floors, all levels, all hights. Only mosquito net shall be measured and paid in Sqm. All aluminum sections shall be paid under relevant tender item in kg.

Material and Workmanship:
Material shall be as per item description and general specifications.

Mode of Measurements and Payment:
The item shall be measured for a unit of sqm. The aluminium frame shall be paid in relevant tender item in kg.

7.37 Providing and Fixing in positionlock and handle system for aluminium sliding shutters including all necessary material, labour, hardware, accessories etc. complete
Around 165MM ECO CONCEALED SLIDING LOCK AUTO of HIVIK / PEGO / Swastik Aluglaze

Material:
The material shall be of best quality as mentioned in item description and shall be got approved by architect/engineer in charge prior to its use.

Workmanship:
The item shall be operated as per drawing, manufacturer's specifications and best practices prevailing in the industry with all necessary tools, tackles and equipments to the satisfaction of architect/engineer in charge.

Mode of Measurement and Payment:
The item shall be measured and paid for a unit of nos. installed.

9.48 Providing and fixing 18/20mm thick 22"x22" sized mirror polish green kotah flooring over 20mm (average) base of Cement Mortar 1:6 (1 Cement : 6 coarse sand) on new surface and jointed with flush pointing & cleaning the surface etc complete including dismantling of exiting flooring etc complete.

Materials:
Water shall conform M-1. Cement mortar shall conform to M-11 of GTS published by the R&B Department Government of Gujarat.

Polished Kota stone shall be calibrated for even thickness and shall be of uniform colour and even shade of size 22" x 22" with all its edges being cut in true right angle and shall be as per sample approved by the architect and/or engineer-in-charge.

Workmanship:
Each slab shall be cut to the required size and shape and fine chisel, dressed at all the edges.(Flat dressing –sample to be got approved).

The sides thus dressed shall have full contact if laid along a straight edge. The sides shall be table rubbed with coarse sand, before paving. All angles and edges of the slabs shall be truly square and free form chipping and shall give a plane surface. The thickness of the slab shall be 25 mm. (average) as specified in the item but not less than 20 mm. at any place of the slab.

Bedding for the kotah slab flooring shall be of cement mortar 1:6 (1 cement: 6 coarse sand) of average thickness 50 mm. as given in the description of the item. Sub grade shall be cleaned, wetted, and mopped. Mortar of the specified mix and thickness shall then be spread on an area sufficient to receive one kotah slab. The slab shall be washed clean before laying. It shall be laid on top pressed, tapped gently to bring it in level with the other slabs. It shall then be lifted and laid aside. Top surface of the mortar shall then be corrected by adding fresh mortar at hollows or depressions. The mortar shall then be allowed to harden a bit. Over this surface, cement slurry of honey-like consistency shall be applied. The slab shall then be gently placed in position and tapped with wooden mallet till it is properly padded in level with and close to the adjoining slab. The joint shall be as fine as possible. The slabs fixed in the floor adjoining the wall shall enter not less than 10 mm. under the plaster, skirting or dado. The junction between the wall and floor shall be finished neatly. The finished surface shall be true to levels and slopes, as directed.

While laying, any chiselling which may be required for making the skirting or dado flush with the plaster and/or other finishes shall be done. Necessary grooves of required size in between plaster and/or other finishes, dado or skirting (if required) shall be provided. Forming machine-cut/rounded edges, gutters, sills, platforms, channels, curbing, etc. if any, if required, shall be provided as per the drawing and design.

In places where full size stones cannot be fixed, they shall be cut to the size and smoothened at edge to give straight and true joints.

All necessary slopes, gradients and levels shall be truly maintained as required and directed by the Architect and Engineer-in-charge.

The floor shall be kept wet for a minimum period of 7 days, so that bedding and joints set properly.

If any stone is disturbed or damaged it shall be refitted or replaced, properly jointed and polished.

The holes required for Nahni traps, pipes any other fittings shall be made without any extra cost.

Matching Pigment shall be added in the cement for joints to have parity with the stone colour.

Mode of Measurements and Payment:

Kotah slab flooring shall be measured in m2. for visible area of work done.

The treads of stairs and steps paved with stone without nosing shall also be measured under this item.

The rate shall include the cost of all materials (inclusive of all taxes, levies, and delivery at site), labour & sundry involved in all the operations, at all floors, at any height and level, as described above. It shall also include for breakage and wastage. Floating materials and margin of profit shall also be included. All material samples shall be approved by the Architect/Engineer-in-charge before placing orders.

No extra shall be paid for any small quantities like narrow widths, mitred & returned ends, rounds & cutting, fixing and making good up to & around pipes, fittings and fixtures etc.

The rate shall include for fixing the flooring in composite pattern as per the drawings, using different materials and sizes.

The measurements of the different materials shall be taken category-wise separately and paid accordingly.

The basic rate, if at all provided or agreed upon includes cost of material, all taxes, levies & cost of delivery at site.

The risers of steps, skirting or dado shall be measured in m2. Length shall be measured along the finished faces of risers, skirting or dado. Height shall be measured from finished level of treads or floor to top. Lining of pillars shall be measured under this item.

9.49A P & L vitrified tile flooring over 20 mm (average) base of cement mortar 1:6 (1 cement: 6 coarse sand) on new surface or fixing on existing flooring by adhesive material including dismentaling of existing flooring and jointed with color cement slurry including finised with flush pointing & cleaning the surface etc. complete for DARK shade
Size: 600 mm x 1200 mm x 8 mm
Kajaria : Estoria Beige Polished OR equivalent

Material:
Vitrified floor tiles shall be of best quality as approved by the Engineer-in- charge. They shall conform to the relevant IS Codes. The make & color shall be as approved by Architect.

They shall be monolithic and available in smooth, mirror-polished and Estoria Beige Polished finishes, in sizes 24” x 24”,12"x12", 8"x8" and 8"x4" or as specified in BOQ / drawings. They shall have a size tolerance of $\pm$ 0.5%, in length and width and $\pm$ 5% in thickness. Allowable warpage shall be $\pm$ 0.2%. Allowable squareness wedging shall be $\pm$ 0.5%. Their water absorption rate shall be less than 0.5%. They shall offer hard-working and hard-wearing floors for homes, public buildings, apartments and airports. The tiles shall be of ASTM or DIN standards.

They shall be extremely strong, breaking strength of the tile being 1600 Kg/cm2., flexural strength, 200 Kg/cm2. and bonding strength of 250 Kg/cm2. They shall offer good resistance to abrasion, i.e. greater than 100. They shall be scratch resistance, their hardness on the Moh's scale shall be min. 7. They shall be able to resist thermal shock upto 10 cycles. They shall have a bond strength of 250 Kg/cm2. and shall have a density of greater than 2.2 gm/cc. They shall have 0.60 co-efficient of friction for polished/unpolished surfaces.

Water shall conform to M-1 and Cement mortar shall conform to M-11 of GTS Booklet.

Workmanship:
Bedding
The sub-grade shall be cleaned, wetted and mopped. The bedding shall then be laid evenly over

the surface, as described above, tamped and corrected to desired level and allowed to harden enough to offer a rigid cushion to tiles and to enable the mason to place wooden planks across and squat on it.

The white/coloured vitrified/ceramic tiles shall then be laid on the cement mortar bedding of 20 mm. thickness, in CM 1:6.

The mortar shall have sufficient plasticity for laying and there shall be no hard lumps that would interfere with the evenness of the bedding. The base shall be cleaned and well wetted, before laying. The mortar shall then be spread in thickness not less than 15 mm. at any place and average 20 mm. thick. The proportion of the cement mortar shall be as specified in the item.

Fixing Tiles

The tiles before laying shall be soaked in water for at least two hours. Neat grey cement grout at 3.3 Kg./Cement/m2. of honey-like consistency shall be spread over the mortar bedding as directed. The edges of the tiles shall be smeared with neat cement slurry. The tiles shall then be well pressed and gently tapped with a wooden mallet till they are properly bedded and in level with the adjoining tiles. There shall be no hollows in bed or joints. The joints between the tiles shall be as thin as possible in straight line or as per pattern.

The tiles shall not have staggered joints. The Nahni trap coming in the flooring shall be so positioned that its grating shall replace only one tile as far as possible. Where full size tiles cannot be fixed, they shall be cut (Sawn) to the required size and the edges rubbed smooth to ensure straight and true joints. The outlets for drainage shall be marked as per drawing and tile fixing shall be carried out accordingly after laying and testing the drainage lines. After the tiles are laid, the joints shall be cleaned of grey cement grout with a wire brush to a depth of about 5 mm. and then grouted with white cement/polymer based grouting of approved make like BAL with or without pigment to match the shade of the topping of tiles. The same cement slurry shall then be spread over the whole surface in a thin coat to protect the surface from abrasive damage and to fill up pinholes that may exist on the surface. White cement with or without matching pigment shall be used for pointing the joints. After fixing the tile finally in an even plane the flooring shall be kept wet and allowed to cure undisturbed for 7 days.

While laying, any chiselling which may be required for making the skirting or dado flush with the plaster and/or other finishes shall be done. Necessary grooves of required size in cm., between plaster and/or other finishes, dado or skirting (if required) shall be provided. Forming machine-cut/rounded edges, gutters, sills, platforms, channels, curbing, etc. if any, if required shall be provided as per the drawing and design.
All necessary slopes, gradients and levels shall be truly maintained as required and directed by the Architect and Engineer-in-charge.

Cleaning:

The surplus cement grout that may have come out of the joints shall be cleared off before it sets. Once the floor has set, it shall be carefully washed and cleaned by oxalic acid and dried. Proper precautions and measures shall be taken to ensure that the tiles are not damaged in any way till the completion of the construction.

If any tile is disturbed or damaged it shall be refitted or replaced, properly jointed and polished.

Mode of measurement and Payment:

The work done shall be measured in m2. for the visible area of work done in floor. The length and width of the flooring shall be measured between the faces of skirting or dados or plastered face of walls as the case may be. The paving under dado or skirting shall not be measured. No deduction shall be made or extra paid for any opening in the floor of area up to 0.1 m2. Nothing extra shall be paid for laying the floors at different levels in the same room. The dado will be measured from the finish floor level to the top of tile fixed.

The rate shall include the cost of all materials (inclusive of all taxes, levies, and delivery at site), labour & sundry involved in all the operations, curing etc complete, at all floors, at any height and level, as described above. It shall also include for breakage and wastage. Floating materials and margin of profit shall also be included. All material samples shall be approved by the Architect/Engineer-in-charge before placing orders.

No extra shall be paid for any small quantities like narrow widths, mitered & returned ends, rounds & cutting, fixing and making good up to & around pipes, fittings and fixtures etc.

The rate shall include for fixing the flooring in composite pattern as per the drawings, using different materials and sizes.

The measurements of the different materials shall be taken category-wise separately and paid accordingly.

The basic rate, if at all provided or agreed upon includes cost of material, all taxes, levies & cost of delivery at site.

The rate shall be for a unit of one m2.

9.50A **Providing and fixing vitrified tile in dedo (with or without groove) over 15 mm (average) base of cement mortar 1:3 (1 cement: 3 coarse sand) on new surface by adhesive material and jointed with color cement slurry including finised with flush pointing & cleaning the surface etc. complete for**
Size: 600 mm x 1200 mm x 8 mm
kajaria : Breccia Vatican Carving or equivalent

Material:
Vitrified floor tiles shall be of best quality as approved by the Engineer-in- charge. They shall conform to the relevant IS Codes. The make & color shall be **Breccia Vatican Carving or equivalent**.

They shall be monolithic and available in smooth, mirror-polished and anti-skid finishes, in sizes 24” x 24”,12"x12", 8"x8" and 8"x4" or as specified in BOQ / drawings. They shall have a size tolerance of $\pm$ 0.5%, in length and width and $\pm$ 5% in thickness. Allowable warpage shall be $\pm$ 0.2%. Allowable squareness wedging shall be $\pm$ 0.5%. Their water absorption rate shall be less than 0.5%. They shall offer hard-working and hard-wearing floors for homes, public buildings, apartments and airports. The tiles shall be of ASTM or DIN standards.

They shall be extremely strong, breaking strength of the tile being 1600 Kg/cm2., flexural strength, 200 Kg/cm2. and bonding strength of 250 Kg/cm2. They shall offer good resistance to abrasion, i.e. greater than 100. They shall be scratch resistance, their hardness on the Moh's scale shall be min. 7. They shall be able to resist thermal shock upto 10 cycles. They shall have a bond strength of 250 Kg/cm2. and shall have a density of greater than 2.2 gm/cc. They shall have 0.60 co-efficient of friction for polished/unpolished surfaces.

Water shall conform to M-1 and Cement mortar shall conform to M-11 of GTS Booklet.

Workmanship:

Fixing Tiles

The tiles, before laying shall be soaked in water for at least two hours. Neat grey cement slurry at 3.3 Kg. Cement/m2. of honey-like consistency shall be spread over the wired plaster as directed. Cement sand mortar of 1:1(cement: fine sand) shall be evenly spread behind the tiles and thereafter tiles shall be well pressed and gently tapped with a wooden mallet till they are properly bedded and in level with the adjoining tiles. The edges of the tiles shall be smeared with neat cement slurry. There shall be no hollows in bed or joints.

The tiles shall not have staggered joints. Where full size tiles cannot be fixed, they shall be cut (Sawn) to the required size and the edges rubbed smooth to ensure straight and true joints. After the tiles are laid, the joints shall be cleaned of grey cement grout with a wire brush to a depth of about 5 mm and then grouted with white cement with or without pigment to match the shade of the topping of tiles. The same cement slurry shall then be spread over the whole surface in a thin coat to protect the surface from abrasive damage and to fill up pin holes that may exist on the surface. White cement with or without matching pigment shall be used for pointing the joints. After fixing the tile finally in an even plane the dado shall be kept wet and allowed to cure undisturbed for 7 days.

All necessary slopes, gradients and levels shall be truly maintained as required and directed by the Architect and Engineer-in-charge.

Cleaning:

The surplus cement grout that may have come out of the joints shall be cleared off before it sets. Once the floor has set, it shall be carefully washed and cleaned by oxalic acid and dried. Proper precautions and measures shall be taken to ensure that the tiles are not damaged in any way till the completion of the construction.

If any tile is disturbed or damaged it shall be refitted or replaced, properly jointed and polished.

Mode of measurement and Payment:

The work done shall be measured in m^2 for the visible area of work done. The height and width of the dado shall be measured as clear dimension only. The dado will be measured from the finish floor level to the top of tile fixed.

The rate for dado shall include the cost of all materials (inclusive of all taxes, levies, and delivery

at site), labour & sundry involved in all the operations, curing etc complete, at all floors, at any height and level, as described above. It shall also include for breakage and wastage. Floating materials and margin of profit shall also be included. All material samples shall be got approved by the Architect/Engineer-in-charge before placing orders.

No extra shall be paid for any small quantities like narrow widths, mitered & returned ends, rounds & cutting, fixing and making good up to & around pipes, fittings and fixtures etc.

The rate shall include for fixing the dedo in composite pattern as per the drawings, using different materials and sizes. The measurements of the different materials shall be taken category-wise separately and paid accordingly.

The basic rate, if at all provided or agreed upon includes cost of material, all taxes, levies & cost of delivery at site.

The rate shall be for a unit of one m^2.

9.55 Providing and laying broken china mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 to plain or slope and to be tempered to bring mortar creme out upto surface using white cement including rounding off junctions and extending them upto 15 cm along the wall, clearing with water and oxalic acid etc. as directed.

MATERIAL

Water shall confirm to M-1 cement mortar shall confirm to M-11, glazed tiles (broken piece) shall confirm to M-55 of GTS Booklet.

WORKMANSHIP

The broken china (size 12mm to 20mm) shall be laid on cement mortar bedding of 20 mm in CM 1:4. The mortar shall have sufficient plasticity for laying and there shall be no hard lumps that would interfere with the evenness of bedding. The base shall be cleared and well wetted. The mortar shall then be spread in thickness not less than 30 mm at any place and average 50mm thickness. Add water proofing material @ 1 kg/ 1 bag of cement 50 kg)

Fixing of broken piece of tiles

The broken piece of tile before laying shall be average size of 12mm to 20mm. Neat grey cement grout at 3.3 kg/cement/sq.mt. of honey like consistency shall be spread over the mortar bedding as directed. The edges of broken pieces be smeared with neat cement slurry. The broken pieces of tiles shall be well pressed and gently tapped with a wooden mallet till they are properly bedded and in level with the adjoining broken pieces of tiles. There shall be no hollows in bed or joints. The joints shall be in true in level to entire broken piece of tile.

The water spout coming in the flooring shall be positioned that the true level where broken piece shall be fixed to the required size and the edges rubbed smooth to ensure straight. The joints shall be filled with grey cement grout with wire brush of trowel to a depth of 5 mm and loose material removed. White cement shall be used for pointing the joints.

At the junctions of parapets and terraces, the flooring shall be finished in quarter round shape size up to 15cms. The work shall be carried out in the best workman like manner. The inter portion of rain water pipe shall be rounded off properly during constructing @ junctions of parapets and terraces. After fixing the broken pieces of tiles finally in an even plane the flooring shall be kept wet and allowed to nature undisturbed for 7 days.

Cleaning: The surplus cement grout that may have come out the joints shall be cleared off before it sets. Once the floor has set, it shall be carefully washed, cleared by dilute oxalic acid and dried. Proper precaution and measures shall be taken to ensure that the broken pieces are not damaged in any way till the completion of the construction.

Mode of Measurement and Payment

The work done shall be measured in Sq.Mt. for visible area of work done. No deduction shall be made nor extra paid for any opening in the floor of area up to 0.1 sq.mt. Nothing extra shall be paid for laying the floors at different levels in the same.

The rate shall be for a unit of one Sq.Metre.

9.57 Extra for providing and grouting grooves of size up to 3mm x 5mm with epoxy grout in floor or dado of any size with PVC spacer and matching colour epoxy grout of BAL of approved shade. Rate shall be inclusive of cleaning the grooves, protecting the edges before filling, and cleaning the tiles on completion etc. all complete as per detailed specifications and instructions of Engineer in charge.

Material:

The Epoxy grout consists of mix of 0.70 kg of organic coated filler of desired shade and mixing of 0.10 kg of hardener and 0.20 kg of resin per kg.. They have very low water absorption, higher compressive strength and are resistant to staining and easy to maintain. Epoxy grout is a waterless mix formed by mixing a base material (part A) and a hardener (part B). These components are mixed at site just prior to grouting.

Workmanship:

It shall be ensured that tiles are firmly set and adhesive or mortar is completely dry for 24 hours. All spacers, pegs, ropes and string shall be removed and joints be cleaned by removing free loose dirt particles

The complete unit Part A (Base) and Part B (Hardener) shall be properly mixed in given ratio. The desired colour of grout shall be obtained by mixing required quantity of colour with base to ensure homogeneity.

The grout shall be pressed firmly by using a hard rubber squeeze into joints ensuring that joints are completely filled upto minimum depth of 5mm. Excess grout material shall be removed from joints and surface by moving squeeze on grout line after 22 to 25 minutes. The damp sponge shall be used in circular motion on tile surface to achieve the flush joint. After completion of work the grout haze shall be cleaned with clean water or soap solution. The suitable rubber gloves shall be used to avoid skin contact during application.

Mode of Measurement and Payment:

Length of grouted for whole floor area shall be measured correct to a cm and the area shall be calculated in running metre correct to two places of decimal.

The rate shall include the cost of all materials and labour involved in all operations described above. Nothing extra shall be paid.

9.84 Providing & laying Sandwich platform of maximum 700mm width

a) Sandwich type platform of top stone as 20 mm (+/- 2 mm) thick Granite of approved shade and sample and bottom stone as 25 mm (+/- 5 mm) thick single side polished kota stone with 25 mm thick screed of cement mortar 1:4 alongwith approved adhesive of BAL or equivalent in between two stones. The stone shall be fixed by chasing in to the wall surface and providing necessary MS supports of 50 x 50 x 6mm Angle or "T" (hot dip galvanised) and embedded in between the two stones etc as per the drawing / specification and / or as instructed of EIC complete and

b) 75 mm raised platform (Otli) at floor level with polished kota laid on 50mm screed of (1:2:4) and skirting of kota stone as per design and approved sample. The rate includes rounding, champhering and mirror polishing of edges, facias of granite, MS supports, all material labour and wastage, as per drawing, including necessary bonding adhesive (if required) of Araldite or equivalent. Rate shall be also inclusive of making holes & cutouts for SS sink, Oval wash basin, Piller tap / Bib tap etc. as directed by engineer in charge. (Only finished single side granite work shall be measured & paid for).

Material:

Water shall conform to M-1. Cement shall conform to M-3, Sand shall conform to M-6, Aggregate 20 mm mm. nominal sizes shall conform to M-8 of General Technical Specification Booklet of Civil Works.

Workmanship:

Sandwich type platform of top stone as 18 mm thick Granite of approved shade and sample and bottom stone as 25 mm thick single side polished kota stone with 25 mm thick screed of cement mortar 1:4 in between two stones. The stone shall be fixed by chasing in to the wall surface and providing necessary MS supports of 50x50x6mm Angle or "T" (hot dip galvanised) and embedded in between the two stones etc as per the drawing / specification and / or as instructed of EIC complete and 75 mm raised platform (Otli) at floor level with polished kota laid on 50mm screed of (1:2:4) and skirting of kota stone as per design and approved sample. The rate includes rounding, champhering and mirror polishing of edges, facias of granite, MS supports, all material labour and wastage, as per drawing, including necessary bonding adhesive (if required) of Araldite or equivalent. Rate shall be also inclusive of making holes & cutouts for SS sink, Oval wash basin, Piller tap / Bib tap etc. as directed by engineer in charge.

Mode of Measurement and Payment:

The item shall be measured and paid for a unit of one sqm. Only finished single side granite work shall be measured & paid for.

10.14 Providing & laying cement water proofing of average 115mm thick for terrace for all floors using first layer cement mortar (1:3) over an exsisting surface second layer of arranging brick bats acording to slop adding suitable chemical to make water tieght & again third layer of cement mortar 1:3 on above including adding water proffing compound and finishing top with

net cement slury using cement @ 2.75 kg/sq mt. making any patterns and design on the top etc. complete as directed.

Materials:

Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Aggregate 20 mm mm. nominal sizes shall conform to M-8. Cement concrete 1:2:4 proportion measured by volume shall conform to relevant specification of ordinary grade 1:2:4 concrete. Waterproofing compound shall be of best quality and from manufacturer like Cico, Roff, Basf, and ConTech or equivalent, as approved by the Engineer-in-charge. The prior approval for the source shall be taken from the Architect. It shall conform to the relevant IS Code. It shall be used as an excellent cement admixture in all types of concrete/plaster mortars, pointing mortars, masonry works, guniting works and pressure grouting works. It shall improve resistance of concrete surfaces to weathering and chemical attack. It shall be non-toxic so as to use for waterproofing water tanks, reservoirs, bio-gas tank, leaking ceiling, basements, tunnels, lift wells etc. It shall be mixed to concrete or plaster mortar, while mixing. First, water is added and then the admixture, at the rate instructed by the manufacturer. For use of the admixture, precaution shall be taken to use clean materials for preparation of mortar.

Workmanship:

Preparation of Surface: Before the operation for laying the topping is started, the surface of the base concrete shall be thoroughly cleaned of all dirt, loose particles, caked mortar droppings and laitance, if any, by scrubbing with coir or steel wire brush. Where the concrete has hardened so much that roughening of surface by wire brush is not possible, chipping or hacking at close intervals shall roughen the surface. The surface shall then be cleaned with water and kept wet for 12 hours and surplus water shall be removed by mopping before the topping is laid.

Laying:

The screed strips shall be fixed over the base concrete dividing it into suitable panels (not more than 1.8 m). Before placing the concrete for topping, neat cement slurry at 3.3 kg/m2 shall be thoroughly brushed into the prepared surface of the base concrete just ahead of the finish. Concrete of specified proportion and thickness shall be laid in alternate panels to required level and slope and thoroughly tamped and cement concrete 1:2:4 shall conform to relevant specifications of section 2.00.

The cement concrete flooring of 65 mm. thick (Average) is to be laid as per the site condition. The concrete shall be mixed in a mechanical mixer at the work. Hand mixed may however be allowed for smaller quantities of work and in case of failure of machines or as permitted by the Architect. It shall carried be out on a watertight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However, in such cases 10% more cement than otherwise required shall have to be used without any extra cost. The mechanical mixing shall be done for a period of 1.5 to 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose. Flooring of specified thickness shall be laid in accordance with approved pattern or as directed. Finishing operation shall start shortly after the cessation of beating and shall be spread over a period of one to six

hours depending upon the temperature and atmospheric conditions. The surface shall be left for some time till moisture disappears from it. Fresh quantity of cement shall be mixed with water to form thick slurry and spread over the surface while the concrete is still green. Use of dry cement or cement and sand mixture sprinkled on this surface to stiffen the concrete or absorb excessive moisture shall not be permitted. The cement slurry shall then be properly pressed twice by means of iron floats, once, when the slurry is applied and the second time when cement starts setting and is to be finished smooth. The surface shall be marked with string in square grid of 300x300 mm or B.R.C. fabric jali to make the surface non-slippery as and when directed. The junction of floors with wall plaster, dado or skirting shall be rounded off where so required up to 25 mm. radius. Flooring in lavatories and bathrooms shall be laid after fixing of water closet and squatting pans and floor traps, which shall be plugged while laying the floors and opened after the floors, are completed. Any damage, done to water supply or sanitary fittings during execution of work shall be made good.

After the final set, the concrete shall be kept continuously wet, if required by ponding, for a period of not less than 7 days from the date of placement.

The form work shall be provided if necessary as directed by Architect. Concreting shall be done as per alternate bay method with necessary centering either by mastic or cement mortar as directed.

Finishing the Surface:

After the concrete has been fully compacted it shall be finished by trowelling or floating with neat cement rendering. Finishing operations shall start shortly after the compaction of concrete and the surface shall be trowelled three times at intervals so as to produce an uniform and hard surface. The satisfactory resistance of floor to wear and tear, depends largely upon the care with which trowelling is carried out. The time interval allowed between successive trowelling is very important. Immediately after placing cement rendering, only just sufficient trowelling shall be done to give a level surface. Excessive trowelling in the earlier stages shall be avoided as this tends to bring a layer in cement to the surface. Sometime, after the first trowelling, the duration depending upon the temperature and atmospheric conditions and the rate of setting of the cement used, the surface shall be retrowelled to close any pores in the surface and to bring to surface and to scrape off any excess water in concrete or any laitance. No dry cement shall be used directly on the surface to absorb moisture or to stiffen the mix. The final trowelling shall be done well before the concrete has become too hard but at such a time that considerable pressure is required to make any impression on the surface. If directed by the Architect & Engineer-in-charge, approved mineral non-fading pigment shall be added to the cement for coloured IPS. And the same shall be properly mixed dry thoroughly in mechanical mixer. this dry mixer shall be used to carry out the coloured IPS as mentioned above. Extra shall be paid for coloured IPS if specified in schedule of quantities.

The topping shall be rendered with 1:1, (1 part cement with a suitable mineral pigment (if directed), 1 part sand), instead of cement only to fill up the pin-holes etc.

Wherever floor hardeners (non-metallic - colored or non colored) are to be used, they shall be used as per the manufacturer’s specifications and shall be approved by engineer-in-charge before using. The same shall be paid extra if it is specified in SOQ.

Wherever the fibers are to be used it shall be approved by the engineer-in-charge and shall be used by manufacturer's specifications. The fibers shall be paid in relevant tender item ,if it is not inclusive in item

Wherever the Indian Patent Stone flooring is used as a finishing on roof, the joints shall be filled with approved bitumastic filler/acrylic sealant in a workman-like manner.

Mode of Measurements and Payment:

The rate shall include the cost of all materials and labour involved in all the operations described above. No deduction shall be made or extra paid for any opening up to 0.1 m2. in area, in the floor, nothing extra shall be paid for laying the floor at different levels in the same room or the courtyard. The rate shall be for all heights all floors all places all shapes etc.

The rate shall be for a unit of one m2.

10.15 Waterproofing Works:

Surface Preparation and Leak test:

- The surface of application must be thoroughly prepared by mechanical means, to remove all loose particles, laitance, etc.

- Oil and grease, if any, must be de-greased with suitable solvents. It then must be washed off with jet of water and brought to touch dry state.

- Chase the construction joints, cracks and seal the same by,

a) groove filling by,

a.1) forming a U shaped groove of size (width and depth) as required as per manufacturer's specifiatoin & made clean a.2) apply priming coat of Dr. Fixit pidiprime and, a.3) Fill the groove with Dr. Fixit PU sealant and,

b) Grouting by,

b.1) Drilling hole of required size into the structure and fixing grouting nozzle. Allowing nozzle to set for 24 hours, b.2) grouting the nozzles with Cement Slurry admixed with Dr. Fixit Pidicrete AM @ 225 gm/bag of cement, non-shrink grout to full saturation using gravitational pressure and b.3) Seal the nozzle loation from the top by providing and applying Dr. Fixit HB Mortar / Hydroblok300 non-shrink polymer mortar, curing etc. complete.

- Treatment around pipe entry / exit locations from internal side:

1) Providing and applying Dr. Fixit Bathseal Tape around the pipe periphery within the cut outs section of the slab, 2) Providing and applying Dr. Fixit Bathseal grout non-shrink, free flow, high strength cementitious grout material to seal the angular gap around pipe periphery and core cut in the slab and, 3) providing and applying Dr. Fixit / Bostik PU sealant around the top periphery of pipe all as per manufacturer's recommendation.

- Necessary leak test/pond test for 48 Hrs. before and after the surface preparation is mandatory for certification

1) Providing and applying one coat of Dr. Fixit Torchshield Primer at a rate of 3-5 Sqm / litre / coat, 2) Providing and applying Dr. Fixit Torchshield APP membrane being fixed heat welding by keeping 100 mm overlap at longitudinal joints and 150 mm at transverse joints

All work shall be carried out by the approved applicator and completely in accordance with the manufacturer's specifications.

Material:

The material shall be as mentioned in item description and shall be got approved prior to its application from engineer in charge or architect.

Workmanship:

Surface Preparation and Leak test:

- The surface of application must be thoroughly prepared by mechanical means, to remove all loose particles, laitance, etc.
- Oil and grease, if any, must be de-greased with suitable solvents. It then must be washed off with jet of water and brought to touch dry state.
- Chase the construction joints, cracks and seal the same by,

a) groove filling by,

a.1) forming a U shaped groove of size (width and depth) as required as per manufacturer's specification & made clean a.2) apply priming coat of Dr. Fixit pidiprime or equivalent and, a.3) Fill the groove with Dr. Fixit PU sealant or equivalent. and,

b) Grouting by,

b.1) Drilling hole of required size into the structure and fixing grouting nozzle. Allowing nozzle to set for 24 hours, b.2) grouting the nozzles with Cement Slurry admixed with Dr. Fixit Pidicrete AM @ 225 gm/bag of cement, non-shrink grout to full saturation using gravitational pressure and b.3) Seal the nozzle loation from the top by providing and applying Dr. Fixit HB Mortar / Hydroblok300 non-shrink polymer mortar, curing etc. complete.

- Treatment around pipe entry / exit locations from internal side:

1) Providing and applying Dr. Fixit Bathseal Tape or equivalent around the pipe periphery within the cut outs section of the slab, 2) Providing and applying Dr. Fixit Bathseal grout or equivalent non-shrink, free flow, high strength cementitious grout material to seal the angular gap around pipe periphery and core cut in the slab and, 3) providing and applying Dr. Fixit / Bostik or equivalent PU sealant around the top periphery of pipe all as per manufacturer's recommendation.

- Necessary leak test/pond test for 48 Hrs. before and after the surface preparation is mandatory for certification

1) Providing and applying one coat of Dr. Fixit Torchshield Primer or equivalent at a rate of 3-5 Sqm / litre / coat, 2) Providing and applying Dr. Fixit Torchshield APP membrane being fixed heat welding by keeping 100 mm overlap at longitudinal joints and 150 mm at transverse joints

All work shall be carried out by the approved applicator and completely in accordance with the manufacturer's specifications.

Mode of measurement and payment:

The work shall be measured in unit of smt. and paid for clear plan area of terrace. The rate shall be inclusive of all vatas, materials, labour, tools, tackles, etc. to complete the work to the satisfaction of engineer in charge.

10.16 WATER PROOFING TREATMENT FOR TOILET/BATHROOM - SUNKEN SLAB

Flexible and elastic polymer modified cementitious coating.

1)Surface Preparation: Minor cleaning work, scarifying the surface to remove laitance, cleaning with compressed air, chasing open construction joints & cracks etc. to form a U shaped groove of 20mm x 20mm and filling with polymer modified mortar using URP polymer in the ratio of

1pbw polymer:10 pbw cement: 30 pbw quartz sand.
2)Making of angle fillets all around the periphery of the wall with polymer modified mortar using URP in the ratio of in the ratio of 1pbw polymer:10 pbw cement: 30 pbw quartz sand.
3) Providing and applying flexible and elastic, two component, polymer modified, cementitious coating system, having elongation capacity of over 100%, applied in 2 coats in the form of slurry at a total consumption of 1.5 Kg per Sq.Mt. over the RCC slab and on the retaining wall surfaces upto a height of 1.00 mtr. above F.F.L(for shower areas upto full HT), ponding the floor with water, for 3 days to test water tightness etc. complete.
4)Protective plaster/base coat- Providing & Applying 12-15mm thick Protective Screed / Plaster in cement mortar of 1:4 including integral waterproofing admixture @ 100 ml per bag of cement with wattas at the junctions applied on the floor & treated vertical surfaces, broom finished/ smooth finished as directed at site, including curing & testing for watertightness for 7 days etc.complete in all aspects as directed by Engineer/Architect.The area of the floor and sides of sunken portion treated shall be considered for payment purpose.

Material:
The material shall be as mentioned in item description and shall be got approved prior to its application from engineer in charge or architect.

Workmanship:
Surface preparation:
Minor cleaning work, scarifying the surface to remove laitance, cleaning with compressed air, chasing open construction joints & cracks etc. to form a U shaped groove of 20mm x 20mm and filling with polymer modified mortar using Dr. Fixit Pidicrete URP or equivalent polymer in the ratio of 1pbw polymer:10 pbw cement: 30 pbw quartz sand.
Making of angle fillets all around the periphery of the wall with polymer modified mortar using Dr. Fixit Pidicrete URP in the ratio of in the ratio of 1pbw polymer:10 pbw cement:
30 pbw quartz sand.

Application:
Providing and applying "Dr. Fixit Bath seal WPC or equivalent", flexible and elastic, two component, polymer modified, cementations coating system, having elongation capacity of over 100%, applied in 2 coats in the form of slurry at a total consumption of 1.5 Kg per Sqm over the RCC slab and on the retaining wall surfaces up to a height of 1.00 m above F.F.L(for shower areas up to full HT), ponding the floor with water, for 3 days to test water tightness etc. complete.
Protective plaster/base coat- Providing & Applying 12-15mm thick Protective Screed / Plaster in cement mortar of 1:4 including Proof sol LWP or equivalent integral waterproofing admixture @ 100 ml per bag of cement with Vatas at the junctions applied on the floor & treated vertical surfaces, broom finished/ smooth finished as directed at site, including curing & testing for water tightness for 7 days etc. complete in all aspects as directed by Engineer/Architect.

Measurement:
The area of the floor and sides of sunken portion treated shall be considered for payment purpose.

Rate:
The rate quoted shall include all the cost of materials, labour, transportation, testing for water tightness, furnishing necessary guarantee for waterproofing so provided, all as detailed above.

11.10 Providing and fixing eco-friendly light weight calcium silicate false ceiling tiles having Tegular edge & 15 mm Thick Densified edges on the Tile Periphery for Extra Strength The Light weight calcium silicate ceiling tiles shall have, light reflection 85% non-combustible as per B.S. 476 part IV, 100% humidity resistance and also having thermal conductivity 0.043° w/m KC. for the best thermal Insulation. The Light weight calcium Silicate tile shall be of approved texture Fine fissured/Spintone/Cosmos having NRC value of 0.5 & Globe having NRC value of 0.75 NRC or equivalent of size 595 X 595 mm to be laid on true horizontal level suspended inter locking metal grid of hot dipped galvanized steel sections (galvanizing @120 grams per sqm including both side) consisting of main 'T' runner suitably spaced at joints to get required length and size of 24X38mm made from 0.30 mm thick (minimum) sheet, 1200mm centre to centre, and cross 'T' of size 24X28mm made out of 0.33mm (Minimum) sheet spaced 1200mm along spaced between main 'T' at 600mm centre to centre to form agrid of 1200X600mm and secondary cross 'T' of length 600mm and size 24x28mm made of 0.30 mm thick (Minimum) sheet to be interlocked at middle of the 1200X600mm panel to form grid of size 600X600mm resting on periphery walls/partitions on a perimeter wall angle precoated steel of size (24X24X3000 mm made of 0.40mm thick (minimum) sheet with the help of rawl plugs at 450mm centre to centre with 25mm long dry wall screws @ 230mm interval and laying 15mm thick Densified edges light weight calcium silicate ceiling tiles of approved texture (Fine Fissured/Cosmos/Spintone) in the grid including, cutting /making opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc., wherever required, Main 'T' runners to be suspended from ceiling using G.I. slotted cleats of size 25X35X1.6mm fixed to ceiling with 12.5mm dia and 50mm long dash fasteners, 4mm G.I. adjustable rods with galvanized steel level clips of size 85X30X0.8mm, spaced at 1200mm centre to centre long main 'T' bottom exposed with 24mm of all T-sections shall be pre-painted with polyester baked paint, for all heights, as per specifications, drawings and as directed by engineer-in-charge.Note:- Only calcium silicate false ceiling area will be measured from wall to wall. No deduction shall be made for exposed frames/opening (cut outs) having area less than 0.30 sqm. The calcium silicate ceiling tiles shall have NRC. Value of 0.50 (Minimum) for Fine fissured/Spintone/Cosmos and 0.75 NRC for Globe, light reflection 85% non-combustible as per B.S. 476 part IV, 100% humidity resistance and also having thermal conductivity. 0.043° w/m KC.for the best thermal Insulation

Material and Workmanship:

15 mm thick fully perforated calcium silicate board made with Calcareous & Siliceous materials reinforced with cellulose fibre manufactured through autoclaving process to give stable crystalline structure with minimum compressive strength 225 kg/ sq. cm, bending strength 100 kg/sq. cm , of size 595x595 mm, having perforation of dia. 10 mm with minimum perforated area 18 % with non woven tissue on the back side, having an NRC(Noise Reduction Coefficient) as mentioned in item description, with 50 mm thick rock wool of 48 kg /cum backing shall be used.

Frame is made up of interlocking metal grid of hot dipped galvanized steel sections (galvanized @ 120 grams/ sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to enter and cross "T" of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm etc. complete.

Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanized butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge. false ceiling tiles of approved texture shall be laid in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc.

Manufacturers test certificate/ report of invoice shall be submitted for every delivery challan by suppliers.

Precaution:

All wet trades such as plastering, conduting and painting etc, be completed prior to start of false ceiling works. Air conditioning duct work is to be completed preferably even before the suspension of the grid section.

Electrical chasing or drawing lines & cables, etc are to be in place before start of false ceiling work. No unauthorized weight is put on false ceiling. Lighting fixtures, diffusers are to be suspended independently with proper chain/wire & dash fasteners as directed by Engineer In Charge/manufacturer guide line. The area shall be made dry prior to ceiling installation work Care should be taken while placing Light Weight calcium silicate tiles into the grid so that there will be no displacement to grid and stains/ dirty marks put by the workers. (Worker should preferably wear clean soft cotton gloves while placing tile).

Measurements:

Length and breadth shall be measured correct to a cm. Areas shall be calculated nearest to 0.01sqm. No deduction in measurements shall be made for openings of areas upto 0.36 Sqm. Nothing extra shall be payable either for any extra material or labour involved in forming such openings. For openings exceeding 0.36 sqm in area, deductions in measurements for the full opening in multiple of area of each tile (0.36 Sqm) will be made.

Rate:

The rate shall include the cost of all materials and labour involved in all the operations described above.

11.28 Providing and applying 20 mm thick double coat mala cement plaster on interior and/or exterior brick / concrete work for plastering comprising of base coat of 12 mm thick cement plaster in cement mortar (1 Cement : 4 coarse sand) in rough finishing and 8 mm thick top coat of cement mortar 1:2 (1 Cement : 2 Coarse sand) finished with trovel including) including scaffolding , curring and providing and fixing 100 mm to 150 mm wide strip of chicken net at vertical and horizontal jionts of rcc and mesonary etc. complete.

Materials:

Water shall conform to M-1. Sand shall confirm to M-6, the cement mortar of proportion 1:4 shall conform to M-11 of GTS booklet.

Workmanship:

Scaffolding:

Wooden ballies, bamboo, planks, trestles and other Steel scaffolding shall be sound. These shall be properly examined before erection and use. Stage scaffolding shall be provided for ceiling plaster, which shall be independent of the walls. The sample shall be approved by architect or engineer-in charge before starting the work.

Preparation of back ground:

The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surface shall be roughened by wire brushing if it is not hard and by dense hacking if it is concrete. In case of concrete surface, if a chemical retarder or shuttering oil has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles shall be cleaned off and care shall be taken that none of the retarder is left on the surface. Trimming/Chieseleing of projections on brick/concrete surface wherever necessary shall be carried out to get an even surface.

Raking of joints in case of masonry wherever necessary shall be allowed to dry out for sufficient period before carrying out the plasterwork.

Scaffolding for carrying out plastering work shall be double scaffolding having two sets of vertical supports so that the scaffolding is independent of the walls.

Preparation of Surface:

All putlog holes in brickwork and junction between concrete and brickwork shall be properly filled in advance. Joints in brick work shall be raked about 10 mm. and concrete surface shall be hacked to provide grip to the plaster. Projecting burrs of mortars formed due to gaps at joints in shuttering shall be removed. The surface shall be scrubbed clean with wire brush/coir brush to remove dirt, dust etc., and the surface thoroughly washed with clean water to remove efflorescence, grease and oil etc., and shall be kept wet for a minimum of two hours before application of plaster.

For external plaster, the plastering operation shall be started from the top floor and carried downwards. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready and the temporary supporting ceiling resting on the wall of the floor have been removed. Ceiling plaster shall be completed before starting plaster to walls.

Applications of Plaster:

The base coat shall be carried in CM 1:4 having average 15 mm. thickness. Before the plastered surface hardens roughing shall be done to receive the second coat. Second coat shall be applied only after minimum curing of 72 hours. The second coat shall be carried out in CM 1:3 having average 6 mm thickness. The surface shall be finished smooth with steel trowel (Mala finish).

The plaster about 5 cm x 5 cm bull-marks shall be first applied horizontally and vertically at not more than 2 m. intervals over the entire surface to serve as gauge. The surfaces of these gauges shall be truly in plane of the finished plastered surface. The mortar shall then be applied in uniform surface slightly more than the specified thickness, then brought to a true surface by working a wooden straight edge reaching across the gauges with small upwards and sideways movements at a time. Finally, the surface shall be finished off true with a trowel or wooden float according to the texture, smooth or sandy granular, as may be required. Excessive Trowelling or over working the float shall be avoided. All corners, arises, angles and junctions etc. shall be carried out with proper templates to the size required. The surface shall be finished smooth using neat cement at the ratio of 2.2 kg/m2.

Cement mortar shall be used within half an hour after addition of water. Any mortar or plaster which is partially set shall be rejected and removed from the site.

In suspending the work at the end of the day, the plaster shall be left out, clean to line both horizontally and vertically. While recommencing the plaster, the edges of the old work shall be scrapped clean and wetted with cement putty before plaster is applied to the adjacent areas to enable the two to properly join together. Plastering work shall be closed at the end of the day on the body of the wall and shall not be nearer than 15 cm. to any corners or arises. Horizontal joints in plasterwork shall not also occur on parapet tops and copings as these invariably lead to leakage. No portion of the surface shall be left out initially to be patched up later on.

Each coat shall be kept damp continuously till the next coat is applied or for a minimum period of 7 days. Moistening shall commence as soon as plaster is hardened sufficiently. Soaking of walls shall be avoided and only as much water as can be readily absorbed shall be used, excessive evaporation on the sunny or windward side of building in hot air or dry weather shall be prevented by hanging mats or gunny bags on the outside of the plaster and by keeping them wet.

Mode of Measurements & Payment:

The rates shall include for work at any height, position, and floor and for all necessary scaffolding, etc. as may be required. The rates shall also include for hacking and/or bush hammering to form key for plaster and for spatter dash treatment, as specified, as and where necessary.

The rates shall also include for all work in narrow width, arises, rounded angles, chamfered external angles, drip moulds, grooves and for making good after all trades.

The rate shall also include for groove with cement finish up to 12 mm x 10 mm to be formed in plaster at junction of slab and beam and slab and brick without any extra charge. The rate shall also include for similar grooves in plaster at the junction of masonry and wood or steel door/window/ventilator frame or at bottom of beam/lintels as drip moulds without extra charge.

All plastering shall be measured in m2, unless otherwise specified. Length, breadth or height shall be measured correct to a centimeter.

Thickness of the plaster shall be exclusive of the thickness of the key i.e. grooved or open joints in

brick work, stone work, etc. or space between laths. Thickness of plaster shall be average thickness with minimum 10 mm, at any point on the surface.

The measurement of wall plastering shall be taken between the walls or partitions (dimensions before plastering being taken) for length and from the top of floor or skirting to ceiling for height. Depth of cover of cornices if any shall be deducted.

Soffits of stairs shall be measured as plastering on ceilings. Flowing/folding soffits shall be measured separately.

For jambs, soffits, sills, etc., openings exceeding 0.5 Sqm and not exceeding 3.0 Sqm, area deductions and additions shall be made in the following manner: -

No deductions shall be made for end joints, beams, posts, etc. for openings not exceeding 0.5 Sqm. each and no addition shall be made for reels, jambs, soffits, sills, etc. of these opening for finish to plaster around ends of joints, beams, posts, etc.

(b) Deduction for openings exceeds 0.5 Sqm. but not exceeding 3.0 Sqm. each shall be made as follows and no addition shall be made for reveals, jambs, soffits, sills, etc. of these openings.
(i) When both faces of any wall are plastered with same plaster, deduction shall be made for one face only.

(ii) When two faces of any wall are plastered with different types of plasters or if one faces is plastered and the other pointed, deductions shall be made from the plaster or pointing on the side of frame for door, windows, etc. on which width of reveals is less than that on the other side but no deductions shall be made on the other side. Where width of reveals on both faces of all is equal, deductions of 50% of area of opening on each face shall be made from area of plaster and/or pointing as the case may be.

For openings having door frames equal to projection beyond the thickness of wall, full deduction for opening shall be made from each plastered face of the wall. Jambs, soffits and sills shall be measured separately and paid for.

In case of openings having area above 3.0 m2 each, full deduction shall be made for the opening but jambs, soffits, and sills shall be measured additionally.

The rate shall be for a unit of one m2.

11.38 Providing and applying average 2 mm. thick exterior/interior wall texture paint (apex duracast) by trowel in single coat including making grooves as approved pattern on already plastered walls with exterior primer followed with 2 to 3 coats of weather proof exterior emulsion paint at all floors, at any height and finished even including scaffolding, curing, making grooves (if required any) etc. complete as per drawing / specifications and / or as directed by the Engineer-in-charge. The rate shall be inclusive of exterior primer, forming grooves, exterior texture and exterior emulsion paint.

Materials

Materials to be used for this item shall be as per standard manufacturer's specifications as approved by Architect/Engineer in charge.

Workmanship

The work shall be carried out as per the prevailing best practices in the industry. It shall be carried out as per recommended by standard manufacturer's procedure.

Mode of Measurement

All the work shall be measured in the decimal system as under;

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 m.

All works shall be measured in sq. mt. In jambs, soffits, sills etc, and for opening not exceeding 0.5 m2 each in area, for ends of joints, posts, beams, girders, steps, etc not exceeding 0.5 m2 each in area and for openings exceeding 0.5 m2 and not exceeding 3.0 m2 each in area, deductions and additions shall be made as under:

(1) No deduction shall be made for ends of joints, beams posts, etc. and for openings not exceeding 0.5 m2 each. No addition shall be made for reveals, jambs, soffits, sills etc. of these opening nor for finish around ends of joints, beams, posts etc.

(2) Deductions for openings exceeding 0.5 m2 but not exceeding 3.0 m2 each shall be made as follows and no addition shall be made for reveals, jambs, soffits etc. of these openings:

(a) When both the faces of walls are provided with the same finish, deduction shall be made for one face only.

(b) when each face of wall is provided with a different finish, deduction shall be made for that side of frame for door, windows, etc. on which width of reveals is less than that of the other side. Where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from total area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deduction shall be made if when width of reveal on the treated side is less than that on the untreated side, but if the width of reveals is equal or more than on the untreated side neither deduction nor additions to be made for reveals, jambs, soffits, sills. etc.

(3) In case of area of openings deduction shall be made for opening but jambs, soffits shall be measured.

(4) No deductions shall be made for attachment such as casing, conduits, pipe, electric wiring and the like.

Corrugated surface shall be measured flat as fixed and not girth. The quantities measured shall be increased by the following percentage and the resultant shall be included with the general areas:

(a) Corrugated steel sheets ……. 14%
(b) Corrugated A.C. Sheets ……20%
(c) Semi Corrugated A.C. Sheets ……10%
(d) Nainital pattern roof (Plain sheeting with rolls) ….10%
(e) Nainital pattern roof (With Corrugated sheets) ….25%

Cornices and other wall features, when they are picked out in a different finish / colour shall be girthed and included in the general area.

The rate shall include the cost of all materials, labour, scaffolding, protective measures etc. required for the above specified operation, at all floors, at any height, in any position. Priming and Alkali resistant treatments, scrapping of surface washing etc. surface spoiled by smoke soot, removal of oil and grease spots, treatments for infection with not be paid extra. This shall also include conveyance, delivery, handling unloading, storing work etc.

The rate shall be for a unit of one sq. meter.

11.40 Providing and applying concrete stamping on exterior face of the structure as per sample approved by the architect and/or engineer - in - charge including cleaning and brushing the surface, providing requisite base coat and top coat as per the requirement of the design, cleaning the surface and making good and finishing with weatherproof coat etc. complete with all necessary material, labour, tools, tackles, hardware, accessories, scaffolding etc. all to the satisfaction of the architect and/or engineer - in - charge. The rate shall be for a complete item and applying at all heights, all floors and all levels
a) Luxture "Decorcem"

Materials

Materials to be used for this item shall be as per standard manufacturer’s specifications as approved by Architect/Engineer in charge.

Workmanship

The work shall be carried out as per the prevailing best practices in the industry. It shall be carried out as per recommended by standard manufacturer’s procedure.

Mode of Measurement

All the work shall be measured in the decimal system as under;

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 m.

All works shall be measured in sq. mt. In jambs, soffits, sills etc, and for opening not exceeding 0.5 m2 each in area, for ends of joints, posts, beams, girders, steps, etc not exceeding 0.5 m2 each in area and for openings exceeding 0.5 m2 and not exceeding 3.0 m2 each in area, deductions and additions shall be made as under:

(1) No deduction shall be made for ends of joints, beams posts, etc. and for openings not exceeding 0.5 m2 each. No addition shall be made for reveals, jambs, soffits, sills etc. of these opening nor for finish around ends of joints, beams, posts etc.

(2) Deductions for openings exceeding 0.5 m2 but not exceeding 3.0 m2 each shall be made as follows and no addition shall be made for reveals, jambs, soffits etc. of these openings:

(a) When both the faces of walls are provided with the same finish, deduction shall be made for one face only.

(b) when each face of wall is provided with a different finish, deduction shall be made for that side of frame for door, windows, etc. on which width of reveals is less than that of the other side. Where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from total area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deduction shall be made if when width of reveal on the treated side is less than that on the untreated side, but if the width of reveals is equal or more than on the untreated side neither deduction nor additions to be made for reveals, jambs, soffits, sills. etc.

(3) In case of area of openings deduction shall be made for opening but jambs, soffits shall be measured.

(4) No deductions shall be made for attachment such as casing, conduits, pipe, electric wiring and the like.

Corrugated surface shall be measured flat as fixed and not girth. The quantities measured shall be increased by the following percentage and the resultant shall be included with the general areas:

(a) Corrugated steel sheets ……. 14%
(b) Corrugated A.C. Sheets ……..20%
(c) Semi Corrugated A.C. Sheets ……10%
(d) Nainital pattern roof (Plain sheeting with rolls) ….10%
(e) Nainital pattern roof (With Corrugated sheets) ….25%

Cornices and other wall features, when they are picked out in a different finish / colour shall be girthed and included in the general area.

The rate shall include the cost of all materials, labour, scaffolding, protective measures etc. required for the above specified operation, at all floors, at any height, in any position. Priming and Alkali resistant treatments, scrapping of surface washing etc. surface spoiled by smoke soot, removal of oil and grease spots, treatments for infection with not be paid extra. This shall also include conveyance, delivery, handling unloading, storing work etc.

The rate shall be for a unit of one sq. meter.

11.41 Providing and fixing freeform average 10 mm thick stoncrete plaster of vyara or quivalent completely as per manufacturer's specifications and by the approved installer of the manufacturer in accordance to the design, drawings, specifications and as per sample approved by the architect. The rate shall be for a complete item including all necessary material, labour, tools, tackles, hardware, taxes etc. complete.

Material:

The material shall be two component type i.e. mortar powder and aggregate. The aggregate used for stonecrete plaster shall be clean and dry and of max. size in range of 3-8mm, having compressive strength greater than 15 N/mm2, flexure strength greater than 3 N/mm2, bulk density around 1250 kg/m3 and wet density 2200 kg/m3.

Workmanship:

Surface preparation:

The wall or surface to be treated with stonecrete plaster shall be made ready by applying atleast avg. 15mm thk. Wire finish plaster. In case of stonecrete plaster to be applied on RCC surface, an application of freeform primer rushcoat or equivalent primer is required to be applied on the surface prior to the stonecrete work for proper adhesion.

All the surfaces must be clean, free of dust, grease, dirt, loose particles, disaggregation. The surface must be dry and cracks if any should be repaired. Weak surfaces if any which cannot sustain the contraction of coating must be removed or restored.

Mixing of material:

Add water/liquid to the mixer and then the powder. Make a test mix to adjust the mixing rate. Final water rate will need to be adjusted as per temperature and working conditions.

In case of manual mixing, mix for minimum 2 to 3 minutes until the mixture becomes homogeneous, without lumps and all pigments get well integrated with mix. Only that much quantity of mix should be wetted as can be used up within 30minutes of wetting. Readding of water to the mix should be avoided.

Laying:

The surface must be adequately dampened before the application. Screed strips (preferably aluminum) must be applied on the surface to ensure even thickness of applied material. These should ideally be not apart by more than 5 to 7 metres in any directions.

In the application process, the mixture may either be thrown forcefully on the wall to get it stick to the surface or may be put on a steel trowel and plastered in an upward motion with pressure.

Then it should be levelled and finished to true line and level. Work shall be done continuous for one entire panel without any breakage. Steel trowel and wooden float shall be used to bring surface to fine finish.

For exposed aggregate finish, aforementioned prepared surface shall be brushed in 2-3 passes using soft bristled brushes after 30-60 minutes of completion of aforementioned prepared surface. Afterwards, brushed surface shall be immediately washed off copiously with water to leave no cement residue. The brushing should be done to ensure uniform exposure of aggregates.

Curing:
In normal conditions, stonecrete cures in 24 hrs. The surface shall be prevented from being subjected to extreme temperature or drying.

Protection or Sealing:
Clean the surface well. Before coating, wash with mild acid. Care should be taken for any existing dirt, dust or efflorescence as they may get trapped under the sealer also get enhanced. Presence of moisture will also produce undesirable cloudiness or lamination to surface.

When the surface is fully dry, mix the water based sealer and apply. Use the low pressure sprayer to apply the sealer evenly. Check with a small patch in trial before its application on entire surface. It is essential that sealer is not over applied, as it can lead to plastic feel. Under application can always be covered with an additional coat. The sealer should be applied and protected for atleast 24 hours period after application from direct rainfall or any source of water.

Mode of Measurements and Payment :

The rate shall include the cost of all materials and labour involved in all the operations described above. The rate shall be for all heights all floors all places all shapes and all grooves mentioned in drawings etc.

The item shall be measured for length and breadth or surface area of wall to be plastered and paid in unit of m2.

13.34 Providing, applying, and Finishing wall with 2 coat of asian, apex ultima paint / berger weather proof exterior emulsion paint on wall surface including to give an required shape even shade over primer of asian / berger after thoroughly brushing the surface to remove all dirt, and remains of loose powdered materials.etc complete

Material:

The water shall confirm to M-1. Acrylic shall be a high performance, long lasting exterior paint and shall withstand extreme rainfall, humidity and heat, lot shall base on specify formulated 100% pure acrylic resins; light fast pigments and other special additives to give excellent protection against alkali and U.V. degradation. It shall form a tough bond with exterior surface, preventing peeling, fungus and algae growth for years and years.

It should have smooth and free flowing consistency and thinner ratio of paint; water shall be

100:40 by volume for each coat. The final finish shall be either smooth or matt as per instruction of engineer-in-charge. It shall be of required shades offered by engineer-in-charge.

Workmanship

Scaffolding: Where scaffolding is required, it shall be erected in such a way that as far as possible, no part of scaffolding shall rest against the surface to be distempered. A properly secured strong and well tied suspended platform (Zoola) may be used for distempering. Where ladders are used, pieces of old gunny bags shall be tied at top and bottom to prevent scratches to the walls and floors. For distempering to ceiling, proper stage scaffolding shall be erected where necessary and the floor area shall be covered with plastic so that the flooring is not spoilt.

Preparation of Surface

The surface shall be thoroughly cleaned of all dust, dirt, mortar dropping and other foreign matter before paint is to be applied.

The surface spoiled by smoke soot shall be scrapped with steel wire brushes or steel scrapers or shall be rubbed with over burnt surkhi or brick bats. The surface shall be then broomed to remove all dust and dirt and shall be washed with clean water.
Oil of grease spots shall be removed by suitable chemical. Smooth surface shall be rubbed with wire brushes.

All unsound portion of the surface plaster shall be removed to full depth of plaster in rectangular patches and plastered again after raking the massonary joints properly. Such portions shall be wetted and allowed to dry. Any crevices, at any level shall be cleaned and filled with the plaster mortar and cured as above. They shall then be given one coat of paint.

All unnecessary nails shall be removed, the holes, cracks, patches etc. shall be made good with material similar in compostion to the surface to be prepared.

New plaster surface shall be allowed to dry for atleast 2 months before applications of paint. Pitting in plaster shall be made good with plaster again and papered with a fine grade sand paper and made smooth. A coat of paint shall be applied over the patches. The surface shall be allowed to dry thoroughly before the regular coat of paint is applied. The surface affected by mould, moss, fungi, algae lichens, efflorescence etc. shall be trated in accordance with IS : 2395 (Part - I) - 1966. Before applying paint any unevenness shall be made good by applying putty made out of plaster of paris mixed with water on entire surface, including filling up the undulation and then sand papering the same after it has dries.

Priming Coat

One coat of exterior emulsion primer shall be applied on new surface. No conventional primer/putty is recommended on the exterior surface. Interior cement primer usage is to be strictly avoided for exterior.

Preparation and Application Paint

Apply two coats of finish paint thinning one liter of paint with 400 ml of water (i.e. add 8 liter of water to 20 liters of drum of 100% acrylic paint). A gap of four hours should be given between two subsequent coats. Horizontal surface like the tops of awnings and parapets should be given an extra fourth coat of greater protection. As the finish paint requires 2-3 days for complete hard dry, a sharp shower immediately after painting will affect film build-up necessitating recoat.

Precautions do not overthin the paint, stir well and strain before use the paint. Do not use any universal stainers or any other colourants. Wear protective clothing like gloves and goggles etc. The finished surface shall be even and uniform in shade, without patches, brush marks, paint drops etc.

Protection measurers shall be taken as per instruction of engineer-in-charge.

15 cm. Double bristled brush shall be used. After a day's work, brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with paint not be used on the work.

Protective Measure

The surface of doors, windows, ventilators, floors, articles of furniture etc. and such other part of the buildings which are not be distempered shall be protected from being splashed upon. Such surface shall be cleaned of distomper splashes, if any.

Mode of Measurements and Payment

All the work shall be measured in the decimal system as under;

(a) Dimensions shall be measured to the nearest 0.01 m.

(b) Area in individual items shall be worked out to the nearest 0.01 m.

All works shall be measured in sq. mt. In jambs, soffits, sills etc, and for opening not exceeding 0.5 m2 each in area, for ends of joints, posts, beams, girders, steps, etc not exceeding 0.5 m2 each in area and for openings exceeding 0.5 m2 and not exceeding 3.0 m2 each in area, deductions and additions shall be made as under:

(1) No deduction shall be made for ends of joints, beams posts, etc. and for openings not exceeding 0.5 m2 each. No addition shall be made for reveals, jambs, soffits, sills etc. of these opening nor for finish around ends of joints, beams, posts etc.

(2) Deductions for openings exceeding 0.5 m2 but not exceeding 3.0 m2 each shall be made as follows and no addition shall be made for reveals, jambs, soffits etc. of these openings:

(a) When both the faces of walls are provided with the same finish, deduction shall be made for one face only.

(b) when each face of wall is provided with a different finish, deduction shall be made for that side of frame for door, windows, etc. on which width of reveals is less than that of the other side. Where width of reveals on both faces of wall are equal, deduction of 50% of area of opening on each face shall be made from total area of finish.

(c) When only one face of wall is treated and the other face is not treated, full deduction shall be made if when width of reveal on the trated side is less than that on the untreated side, but if the width of reveals is equal or more than on the untreated side neither deduction nor additions to be made for reveals, jambs, soffits, sills. etc.

(3) In case of area of openings deduction shall be made for opening but jambs, soffits shall be measured.

(4) No deductions shall be made for attachment such as casing, conduits, pipe, electric wiring and the like.

Corrugated surface shall be measured flat as fixed and not girth. The quantities measured shall be increased by the following percentage and the resultant shall be included with the general areas:

(a) Corrugated steel sheets ……. 14%
(b) Corrugated A.C. Sheets ……20%
(c) Semi Corrugated A.C. Sheets ……10%
(d) Nainital pattern roof (Plain sheeting with rolls) ….10%
(e) Nainital pattern roof (With Corrugated sheets) ….25%

Cornices and other wall features, when they are picked out in a different finish / colour shall be girthed and included in the general area.

The rate shall include the cost of all materials, labour, scaffolding, protective measures etc. required for the above specified operation, at all floors, at any height, in any position. Priming and Alkali resistant treatments, scrapping of surface washing etc. surface spoiled by smoke soot, removal of oil and grease spots, treatments for infection with not be paid extra. This shall also include conveyance, delivery, handling unloading, storing work etc.

The rate shall be for a unit of one sq. meter.

13.39 Washable INTERNAL 100% Acrylic paint:

Providing and applying Easy clean, Washable INTERNAL 100% Acrylic paint (Premium Plastic Paint) - approved make like premium emulsion of asian - Royale luxury , color & shade in three coats (first one coat with brush and final two coats with roller), on newly dry interior plastered surface at all heights, all floors, all levels complete to give an even shade, including required coats (minimum two coats) white cement based putty of Birla white / Acrylic putty of Asian paint or equivalent after thoroughly brushing the surfaces free from mortar dropping and other foreign matter and also including preparing the surface even and sand papered smooth etc. after applying every coat of putty. Priming coat of alkali resistant cement primer (water or

solvent based) is to be applied before commencement of painting etc. complete as directed by engineer-in-charge. Sample to be approved by Architect and Engineer in charge before starting of the work. The rates shall include the cost of filler for filling the cracks on surface.

Material:

The plastic emulsion Paint is not suitable for application on external, wood and iron surface and surfaces which are liable to heavy condensation. These Paints are to be used on internal surfaces except wooden and steel. Plastic Emulsion Paint as per IS 5411 of approved brand and manufacture and of the required shade shall be used.

Workmanship:

Preparation of surface: The surface shall be thoroughly cleaned and dusted off. All rust, dirt, scales, smoke splashes, mortar droppings and grease shall be thoroughly removed before painting is started. The prepared surface shall have received the approval of the Engineer-in-Charge after inspection, before painting is commenced.

Application: Before pouring into smaller containers for use, the Paint shall be stirred thoroughly in its containers, when applying also, the Paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform.

The painting shall be laid on evenly and smoothly by means of crossing and laying off, the latter in the direction of the grains of wood. The crossing and laying off consists of covering the area over with Paint, brushing the surface hard for the first time over and then brushing alternately in opposite direction, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off will constitute one coat.

Where so stipulated, the painting shall be done by spraying. Spray machine used may be (a) high pressure (small air aperture) type, or (b) a low pressure (large air gap) type, depending on the nature and location of work to be carried out. Skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding a suitable thinner.

Spraying should be done only when dry condition prevails. Each coat shall be allowed to dry out thoroughly and rubbed smooth before the next coat is applied. This should be facilitated by thorough ventilation. Each coat except the last coat, shall be lightly rubbed down with sand paper or fine pumice stone and cleaned off dust before the next coat is laid.

No left over Paint shall be put back into the stock tins. When not in use, the containers shall be kept properly closed.

No hair marks from the brush or clogging of Paint puddles in the corners of panels, angles of mouldings etc. shall be left on the work.

In painting doors and windows, the putty round the glass panes must also be painted but care

must be taken to see that no Paint stains etc. are left on the glass. Tops of shutters and surfaces in similar hidden locations shall not be left out in painting. However, bottom edge of the shutters where the painting is not practically possible, need not be done nor any deduction on this account will be done but two coats of primer of approved make shall be done on the bottom edge before fixing the shutters.

On painting steel work, special care shall be taken while painting over bolts, nuts, rivets overlaps etc.

The additional specifications for primer and other coats of Paints shall be as according to the detailed specifications under the respective headings.

Brushes and Containers: After work, the brushes shall be completely cleaned of Paint and linseed oil by rinsing with turpentine. A brush in which Paint has dried up is ruined and shall on no account be used for painting work. The containers when not in use, shall be kept closed and free from air so that Paint does not thicken and also shall be kept safe from dust. When the Paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that they are clean, and can be used again.

Precautions: All furniture, fixtures, glazing, floors etc. shall be protected by covering and stains, smears, splashings, if any shall be removed and any damages done shall be made good by the contractor at his cost. Old brushes and rollers if they are to be used with emulsion paints, should be completely dried of turpentine or oil paints by washing in warm soap water. Brushes and rollers should be quickly washed in water immediately after use and kept immersed in water during break periods to prevent the paint from hardening on the brush and roller. In the preparation of walls for plastic emulsion painting, no oil base putties shall be used in filling cracks, holes etc. Splashes on floors etc. shall be cleaned out without delay as they will be difficult to remove after hardening. Washing of surfaces treated with emulsion paints shall not be done within 3 to 4 weeks of application.

The number of coats shall be as stipulated in the item. The paint will be applied in the usual manner with brush and roller. The paint dries by evaporation of the water content and as soon as the water has evaporated the film gets hard and the next coat can be applied. The time of drying varies from one hour on absorbent surfaces to 2 to 3 hours on non-absorbent surfaces.

The thinning of emulsion is to be done with water and not with turpentine. Thinning with water will be particularly required for the undercoat which is applied on the absorbent surface. The quantity of water to be added shall be as per manufacturer’s instructions.

The surface on finishing shall present a flat velvety smooth finish. If necessary more coats will be applied till the surface presents a uniform appearance.

Mode of measurement & Payment:

The item shall be measured and paid for a unit of one sqm of actual area laid.

13.40 Providing, fabricating & fixing Structural steel work (Confirming to IS 4923-1997) riveted, bolted or welded in built up for all type sections, in framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer and Painting two coats (excluding priming coat) on new steel and other metal surface with enamel paint, brushing, interior to give an even shade including cleaning the surface an even shade including cleanicn the surface of all dirt, dust and other foreign matter. all complete as per the structural designs and directions of Engineer in charge.

Materials & Workmanship :

Prior to fabrication, all tubular / rolled sections shall be cold straightened and freed from twists, wraps etc. Hot working shall be done only after prior permission of the Engineer-in-charge. The surface of the members to be welded shall even so that temporary fastening alignment should not allow passage of a 0.2 mm thick filler gauge more than 20mm. deep from the member's edge. All members shall be cut mechanically by saw or shear or by oxyacetylene flame.

Welding shall generally be done by electric process. Gas welding shall be restored to using oxyacetylene flame with specific approval. Gas welding shall not be permitted for structural steel work.

The work shall be done as shown in the shop drawings which should clearly indicate various details of the joints to be welded; shop and site welded as well as type of electrodes to be used. Symbol for welding on plans and shop drawing shall be according to I.S. 813-1961. As far as possible every effort shall be made to limit the welding that must be done after improper welding that is likely to be done due to heights and difficult position on scaffolding etc.

The welding work shall conform to I.S. 816-1969.

Preparation of surface :

Surfaces, which are to be welded together, shall be free from loose mill scale, rust, paint, grease or other foreign matter. A coating of boiled linseed oil shall be permitted.

Assembly for welding :

Before welding is commenced, the plates shall be first be brought together and firmly clamped or spot welded at specified distance. The temporary connection in form of tack welding has to be strong enough to hold the plates accurately in position without displacement and shall be done keeping in view the finished dimensions of the structure.

Precautions :

The operations connected with welding and cutting equipment shall conform to safety requirement given in I.S. 818-1968. The following points shall be borne in mind during the process of welding:

Welds shall be made in flat position wherever practicable.

Arc length, voltage and amperage shall be suited to the thickness of material, type of groove and other circumstances of the work.

The segments of welding shall be such that where possible, the members which offer the greatest resistance to compression are welded first.

Proper care shall be taken while welding, for shrinkage and distortions, as the drawing dimensions are the finished dimensions of the structure
The defective welds which shall be considered harmful to the strength shall cut and re-welded.

Finished welds and adjacent part shall be protected with clean boiled linseed oil and after all stag has been removed welds and adjacent parts shall be painted after the same are approved.

All the members shall be thoroughly cleaned of rust, cakes, dust etc. and given a priming coat of red lead paint before fixing them in position. All fabricated members shall be suitably packed to be protected from any damage while transportation, if any.

Grinding to the finished level is to be done, if directed by the Architects and Engineer in charge. All exposed weld shall be ground smooth. Welds which have not been ground shall be scrubbed with a 10% solution of Hydrochloric acid which shall be washed off with water before painting unless alkali resistant paint is used.

Erection in general, of the entire/part structure shall be carried out as per the requirement and approval of the Engineer-in- charge. Positioning and levelling of the structure, alignment and plumbing and fixing every member of the structure shall be in accordance with the relevant drawings and to the complete satisfaction of the Engineer-in-charge. The following checking and inspection shall be carried out before, during and after erection:
Damages during transportation
Accuracy of alignment of structures
Erection according to drawings and relevant specifications
Progress and workmanship

Mode of Measurements and Payment:

All work shall be measured on the basis of finished dimensions, as fixed on site and measured net unless specified otherwise.

The weight of steel sections, steel strips in finished works shall be calculated from standard weight on the same basis on which steel is supplied to the Contractor by the Client or those given in relevant IS Codes, if steel is arranged by the contractor.

The weight of steel plates and strips shall be taken from relevant IS Codes, based on 7.85 kg/m² for every mm. sheet thickness, if steel is supplied by the Contractor, otherwise, the weight shall be calculated on the basis on which steel is supplied to the Contractor by the Client.

Unless otherwise specified weight of cleats, brackets, packing pieces, bolts, nuts, washers, distance pieces, separators, diaphragm gusset (taking over all square dimension) fish plates etc. shall be added to the weight of respective items.

In riveted work, allowance shall be made for weight of rivet heads. No deductions shall be made for rivet or bolt holes excluding holes for anchor or holding down bolts.

For forged steel and steel castings, weight shall be calculated on the basis of 7850 kg/m^3.

Unless otherwise specified an addition of 2.5% of the weight of structure shall be made for shop and site rivet heads in riveted steel structure.

Dimensions other than cross sections and thickness of plates shall be measured to nearest 0.001 m.
(i) Mill tolerance shall be ignored when weight is determined by calculation.

The rate includes cost of all material, labour, erection, hoisting, scaffolding, safety measures and sundry required for proper completion of the item of work, at all heights. This shall also include conveyance and delivery, handling, loading, unloading and storing etc. required for completion the item described above including necessary wastage involved.

The rate shall be for a unit of one kg.

Only standard sectional weight will be considered and welding will not be considered in weight.

SPECIFICATION - 6 (SR. NO. - 37)

Providing, fabricating and fixing in walls M.S. C.R.C. Japan sheet of 16 gauge frame inside inserted as per requirement on wall, floor, ceilling all round and 18 gauge SHUTTER for CUPBOARD as per drawing and design with chromium plated fixtures & fastenings, loaking arrangement including applying red oxide priming coat and painting 2 coats of synthetic enamel paint of Asian make approved shade etc.. complete as directed by E.I.C.
In general the work shall be carried out as per the standard specification of P.W.D., C.P.W.D., relevant drawing and as per the instruction of Engineer in charge.

Materials:-
M.S. sheet shall confirm to M-22, (22.1 to 22.2 / P.14 / V.1). Fixtures & fastenings shall confirm to M-43 (43.1 to 43.15.1 / P.19 & 20, V.1). Paints shall confirm to M-44 (44.1 to 44.2.1 / P.21, V.1).

Workmanship:-
M.S. Cupboard shall be consisting of 16 gauge steel frame work and 18 gauge steel shutter.
Steel work shall be done as per item no. 11.4(A) (1.0 to 1.9, P.80, V.1).
Primer coat shall be applied as per item no.19.2 (1.0 to 2.2.5, P. 139, V.1).
Synthetic enamel oil paint shall be applied as per item no. 19.19 (1.0 to 2.1, P.140, V.1).
Fixtures and fastenings shall be of brass chromium plated and of best approved quality and no.s of fixtures and fastenings are as per requirement and as per direction of Engineer in charge.

Mode of measurement and payment:-
Item shall be measure and paid in sq.m basis of actual visible work done.
Rate shall be includes all materials, labour, machinery etc. involved in satisfactory completion of work as described above.
The rate shall be for a unit of one sq.m

SPECIFICATION - 3 (ITEM NO. - 34)

Providing and fixing 25mm thick double polished hand cut **GREEN KOTAH STONE PARTITION** for Cupboards and Store racks including making gissi in brick wall and filling gap with cement slurry and cement mortar etc. complete in true line and level as per detailed drawing and as directed by E.I.C.

In general the work shall be carried out as per the standard specification of P.W.D., C.P.W.D., relevant drawing and as per the instruction of Engineer in charge.

Material:-

Water shall conform to M-1 (1.1 to 1.5 / P.9 / V.1). Cement mortar shall conform to M-11 (11.1 to 11.3.2 / P.11 / V.1). Green Polished Kotah stone shall conform to M-49 (49.1 to 49.2 / P.23 / V.1) (Read Green polished kotah stone instead of Polished kotah stone). In addition to that the green polished kotah stone shall be of approved quality, free from defects and dressed in fashion stated under specification. The thickness shall be as stated in the schedule with 3mm tolerance. The stone shall of uniform green in color with straight edges. The sides of hand cut and machine polished stone shall have perfect right angle and surface on earth. If kotah stone found having variation in shade after polishing and different color shades will be rejected.

Workmanship:-

When the piece of green kotah stone slab is to be fixed for partition etc. the green kotah stone slab shall be fixed as described bellow:

Double polished 25mm thick hand cut green kotah stone shall fitted in walls having a minimum bearing of 35mm all around. The drip for bearing shall form by making gissi in required size, shape and as per detailed drawing. All green kotah stone shall hand cut only. The gissi shall properly wet before placing green kotah stone by spreading water. The gissi shall filled after placing of green kotah stone with cement mortar in proportion of 1:1 (1 cement: 1 sand) and finishing smooth with applying cement putty by means of trowel. The green kotah stone fitted in gissi in true line, level & plumb.

The surface shall be protected from sun and rain and cured for ten days and shall be fairly polished.

Mode of measurement and payment:-

The rate includes cost of all materials, tools, plants and labour involved in satisfactory completion of work.

The rate shall be for unit of one square meter as per actual visible work done.

The work shall be carried out as per detailed drawings and directed by engineer in charge.

Measurement shall be in square meter of the actual visible work done.

SPECIFICATION - 4 (ITEM NO. - 35)

Providing and laying kitchen & pantry PLATFORM with machine cut single side polished 18mm thick GREY GRANITE STONE including making gissi in brick wall and fixing the sized polished Granite stone pieces sandwich type in vertical position and in top position, single polished Granite stone horizontal & vertical facia including half round moulding, filling gap with cement putty and cement mortar etc., complete, in true line and level as per detailed drawing and directed by E.I.C. In general the work shall be carried out as per the standard specification of P.W.D., C.P.W.D., relevant drawing and as per the instruction of Engineer in charge.

Material:-

Water shall conform to M-1 (1.1 to 1.5 / P.9 / V.1). Cement mortar shall conform to M-11 (11.1 to 11.3.2 / P.11 / V.1). Granite stone shall conform to M-52 (52.1 to 52.3 / P.23,24 / V.1). In addition to that, the polished Granite stone shall be of approved quality, free from defects and dressed in fashion stated under specification. The thickness shall be as stated in the schedule with 3mm tolerance. The stone shall of uniform in color with straight edges. The sides of machine cut and machine polished stone shall have perfect right angle and surface on earth. The top Granite stone shall be of best quality and length of single piece Granite stone is not less than 1.80m.

Workmanship:-

The Laboratory platform's top slab shall have at a level of 900mm (100mm thick base of massonary plus 800mm height platform and width shall have as per detailed drawing. The platform shall consist of vertical sandwich partition and top sandwich slab. The bearing of Granite stone slab shall 35mm all around in massonary or R.C.C. work. The drip for bearing shall formed by making gissi in walls. The gissi shall 35mm minimum deep in walls. The gissi shall properly wet before placing Granite stone by spreading water. The vertical partition shall consist of two single side polished machine cut Granite stone jointed with cement mortar in proportion of 1:2 (1 cement : 2 sand). The length of Granite stone placed in vertical position for partition shall be clear length between bottom of top slab and top of massonary base (100mm th.) plus 35mm bearing in massonary base and width is also clear width plus 35mm bearing in brick walls. The vertical facia shall have width of 50mm. The length of vertical facia shall be clear length between bottom of top slab and top of skirting applied at massonary base 100mm th. The vertical facia is fitted in such a manner that it shall be flush with skirting of massonary base. The vertical facia and vertical Granite stone for partition shall have in true line level and plumb. The thickness of top slab shall be 50mm. Top slab shall consist of two 18mm th. Single side polished machine cut Granite stone at top & bottom and 14mm th. Cement mortar of proportion 1:2 (1 cement : 2 sand) of sandwhich type. After placing Granite stone in gissi it shall fill with cement mortar & cement

putty by means of trovel and finished smooth. The top slab shall be in true line & level. The horizontal facia shall be fixed after sandwich type top slab is completed. The width of horizontal facia shall be as per detailed drawing. The projected part of horizontal facia shall be molded in half round shape. The Granite stone for platform's top slab shall have minimum length 1.80m. All Granite stone are machine cut only. The puncture for kitchen sink shall made in Granite stone before fitting if necessary.

When the piece of Granite stone slab is to be fixed for Laboratory platform etc. the Granite stone slab shall be fixed as described below:

The stone is fixed in gissi of required size in wall. The cement mortar 1:2 shall be stuck on the wall at closed interval and then stone slabs shall be pressed on to them firmly. The remaining cavities if any, shall than be filled with grout of cement mortar of the same proportion. The sound coming on gentling tapping of slab will indicate if there are hollows. After grout filling in hollow cavity, if finished slab continue give a hollow sound on taping, the slab shall be removed and reset.

The stone shall be fixed truly in plumb and in perfect line as shown in plans. The surface shall be protected from sun and rain and cured for ten days and shall be fairly polished.

Mode of measurement and payment:-

The rate includes cost of all materials, tools, plants and labour involved in satisfactory completion of work.

The rate shall be for unit of one square meter of platform top area.

The work shall be carried out as per detailed drawings and directed by engineer in charge. Measurement shall be in square meter of the platform top area.

SPECIFICATION - 8 (ITEM NO. – 45)

Providing & fixing 18mm thick GREY GRANITE STONE at window sill, jams & sofit by keeping 225mm wide outer strip resting on sill towards outside & 100mm wide inner strip resting on outer strip by overlapping 25mm towards inside at sill and 300mm wide strip at jams & at soffit and fixing with CM (1 cement: 2 coarse sand), Araldite and screws if necessary including mirror polishing and making half round moulding on both the sides and finishing with colour cement etc. complete as directed by E.I.C.

In general the work shall be carried out as per standard specification of P.W.D / C.P.W.D., relevant drawing & as per the instruction of EIC.

Materials:

The polished Granite stone shall be approved quality, free from defects and dressed in fashion & sated under specification. The thickness shall be as stated in description with 3mm tolerance. The stone shall be of uniformed in color with straight edges. The sides of machine cut and machine polished stones shall have perfect right angles and surface on earth.

Workmanship:

The Granite stone shall be fixed on window sill in two pieces overlapping each other as directed by EIC. The width of outer strip of Granite stone resting on sill shall be 225mm. The outer strip shall fix towards outside of wall by keeping flush with external plaster and having a half round molding of 9mm size is projected outside from external plaster. The width of inner strip of granite stone resting on outer strip shall be 100mm. The inner strip shall fix towards inside of wall by

keeping 9mm projected from internal plaster. The inner side of inner strip shall have half round molding. The overlapping of outer strip & inner strip shall be 25mm and fixed by doing sandwich. The both strips shall fix with each other at overlapping by means of araldite. The outer and inner strip of granite stone shall be fixed on rough surface of wall. These two outer and inner strips are for bottom of sill only. For jams and sofit of window only one strip of 300mm wide is fixed on both the sides of window and chhajja bottom of window. This one strip is half round molded of size 9mm on both the edges and placed in such a way that both edges is projected 9mm from internal plaster and external plaster. The mortar pads of 1:2 CM of uniform width shall be stuck on to the wall at close intervals and the granite stone pressed on it firmly, the remaining cavities if any shall be filled with grout of cement mortar of the same proportion. The sound coming on gentling tapping of slab will indicate if there are hollows. If the hollow can be filled with grout and finished slab is continue give a hollow sound on taping, the slab shall be removed and reset.The stone shall be fixed truly in line & level as shown in plans. The surface shall be protected from sun and rain and curd for ten days and shall be fairly polished.

Mode of measurement and payment:

The granite stone at sill, jams & sofit shall be considered for measuring the area of granite stone. Overlapping of granite stone is considered extra for measuring the area of granite stone. Measurement shall be taken in length and width of completed dimension. The rate includes for execution of whole item and shall be paid for a unit of one square meter of granite stone as per actual work done.

SPECIFICATION - 17 (ITEM NO. – 86)

Providing and Fixing PVC Water Tank of Sintex Pure Water tanks of below mentioned features : Antibacterial, Virgin plastic, Food grade plastic, 100% UV stabilized, rust proof, brighter, stronger, protection against algae formation, maintenance free, triple layer well packed lid of CCWS 0100-01-PURE of required capacity including inlet & outlet nipple etc complete.

In general the work shall be carried out as per the standard specification of P.W.D., C.P.W.D., relevant drawing and as per the instruction of Engineer in charge.

Material:

Polythene used for manufacture of tanks and manhole lids may be high density (HDPE), low density (LDPC) of linear low density (LLDPE) and shall confirm to IS10146 polyethylene shall be compounded with white so as to make the tank resistant to ultra violet rays from the sun. the percentage of white content polyethylene shall be 2.5 + 0.5 percent and it shall be uniformly distributed. The materials used for the manufacture of tank, manhole lid and fittings shall be such that they neither contaminate the water nor impart any taste, color, odder over toxity to water. The material used for making of tank shall Anitlbacterial, Virgin plastic, Food grade plastic, 100% UV stabilised, rust proof, brighter, stronger, protection against algae formation, maintanamnce free and triple layer well packed lid. The tank shall have multi layer of white, black, blue and antibacterial film.

Manufacture and Finish:

The tanks shall be manufactured by rotational molding process each tank and the manhole lid shall be single piece having arrangement for fixing and locking the manhole lid with tanks. Excess material at the mould parting line and near the top rim shall be neatly cut and finished. The

internal and external surface of the tanks shall be smooth, clean, and free from hidden internal defects like air bubble, pit and metallic or other foreign material inclusion Capacity of the tank, minimum weight of the empty tank (without manhole lid) and the manufacture brand name shall be embossed on the top surface of the tank near manhole.

Shape, size & (capacity):

The tank shall be cylindrical vertical with closed top having a manhole. The diameter and height of the tank of various capacities shall be as per manufactures specifications and a clearance of + 3% shall be permitted on these dimensions. Capacity of the tank specified or up to the bottom of the inlet locations whichever is less capacity of the tank shall be specified extra capacity if any, shall be ignored.

Weight and Wall Thickness:

Minimum weight of the empty tank (exclusive of manhole lid fittings) and the minimum wall thickness of top bottom and sides shall be as specified. Wall thickness shall be checked beyond 150mm of the edge where the direction or the plane of the tank surface changes.

Installation and fittings:

The flat base of the tank shall be fully supported over its whole bottom area on a durable rigid flat and level platform sufficiently strong to stand without deflection the weight of the tank when fully filled with water depending upon the capacity and location tanks may be suitably anchored as per the directions of the Engineer in charge. For inlet, outlet, overflow, wash out and other connections fully threaded GI HDPE or PVC connections with hexagonal check nuts and washers on either side of the tank wall shall be provided holes for threaded connection shall be drilled and not punched pipes entering of leveling the tank shall be provided with union and suitably supported on a firm base to avoided damage the tank wall. The lid shall rest evenly and it over the rim of the manhole so as to prevent the ingress of any foreign matter into the tank. The lid shall be providing with suitable arrangement for looking it with the tank

Mode of measurement and payment:-

The rate shall including the cost of tank, manhole lid, Charge and delivery at the place specified Hoisting, Installation, fittings, Platform and anchoring for satisfactory completion of work.
The rate shall be paid per Liter Basis as per actual work done.
Measurement shall be in Liter of actual work done.

List of Approved Materials

Sr. No.	Material	Approved Brand
1	Cement	Ambuja, Ultratech, Sanghi, Kamal, Hathi, JK, Binani , ACC, Siddhi, wonder
2	White Cement	J.K., Birla
3	Coarse Aggregate (machine cut) 6 mm to 40 mm sizes	Sevaliya, Dhansura, Vadagam, Sathamba
4	Stone rubbles and gravels	Sevaliya, Dhansura, Vadagam, Sathamba
5	T.M.T./CRS Steel	SAIL,TATA, JSW steel Ltd., RINL, Vizag, STEEFO, JINDAL STEEL and POWER Ltd
6	Paver Block	Vyara, Super, Alcock
7	Ceramic Tiles, Vitrified Tiles, Glazed Tiles	Qutone, Johnson, Kajaria, AGL
8	Acrylic / Oil Paint	Nerolac, Asian, Berger, Dulux
9	Distemper	Nerolac, Asian, Berger, Dulux
10	Water proofing compound	Fosroc, Dr. Fixit, Sikka, BASF
11	Aluminium Section	Jindal, Hindalco, Domal, National
12	Texture Paint	Asian Paint, Dulux, Berger Paint, Nerolac, Jotun.
13	Italian marble	CMC Classic Marble pvt.ltd / A-class / Nitco Marble / R.K marble pvt .ltd or Equivalent as approved by Architect.
14	Granite	R.K. marble pvt .ltd / Petros stone / Classic Marble pvt.ltd / Oswal marble / Bhandari marble group / Jayantilal sons
15	Kota stone	R.K. marble pvt .ltd / Petros stone / Classic Marble pvt.ltd / Oswal marble / Bhandari marble group / Jayantilal sons
16	Raised/False Access Flooring	Unitile, Huiya, Huatong, Flexi / Access / Linder / Tate
17	Plywood	Kitply, Century Ply, Green Ply, Anchor, Duro
18	Laminate	Sunmica, Greenlam, Century, Signature, Royal Touch.
19	Veneer	Greenlam Deluxe Veneers, Century, Exotic Veneer, Signature, Kit.
20	Flush Door	Anchor, Century, Durodoor, Kit
21	Fire Rated Glassed door/Partition	Saint Gobain, Ais, Fg Glass
22	Door Closer	Hafele, Heti Ich, Ebco, Kitch
23	Handle	Hafele, Heti Ich, Ebco, Kitch
24	Glass Film	3m, Garware, Llumar.

Sr. No.	Material	Approved Brand
25	Wall Putty	JK / Birla white
26	Adhesives	Pidilite / Bluecoat / Euro / Royal bond / McCoy / Bond tite / Astra / BAL
27	Floor Hardener	Ironite / Ferrok / Hardonate / Fosroc
28	Gypsum ceiling	SaintGobain Gyproc / USG BORAL / Asian Gypsum Industries Pvt.Ltd
29	Mineral Fibre Acoustical Suspended Ceiling System	Amstrong / Durlum / Anutone
30	Metal Ceilings	Amstrong / Durlum / Daiken
31	Calcium silicate false ceiling tiles	Aerolite / Hilux / Dekelite
32	Modular Glass Door & Partition With Profile Frame	Dorma / Assa abloy / Deko
33	Glass mossaic tiles	Italica / Palladio / Artistic tile / Bisazza / Picolo
34	Vinyl Flooring	Shaw / Robust / Solarbrite/ Wonder floor / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
35	Kerbstone	Vyara / Basant betons / Alcok
36	Epoxy Grouts - Tile joints	Kerakoll / Roff / Myk Laticrete, BAL endura
37	Stadium Chair	TSI / KF system / Featherlite
38	6.7 to 7.5mm thickness Sports Vinyl Flooring	Ebaco / Grabo / Horizon / tarkett
39	Sports Vinyl Flooring thickness of 4.0mm	Ebaco / Grabo/ Horizon / tarkett
40	Kabbadi Matts (Size: 1 Metre X 1 Metre x 40mm thickness.)	Ebaco / BSW / Remp
41	Karate matt (Size: 1 meter x 1Meter)	Ebaco / BSW / Remp / EDEL International / Koxtons/Stage
42	Multipurpose Turf	Ebaco / EDEL / Condor / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
43	Wooden Sports flooring	Ebaco / tarkett / Horner / Robbins / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
44	ACRYLIC SPORTS FLOORING (8 LAYERS)	Ebaco / Vesmaco / Courtsol / APEX SPORT SURFACES (I) Pvt. Ltd. / Koxtons / Sports Master International LLP
45	Shooting Range	HUB / Aakrid Sports Futuristic
46	Electrical Target Changer Pulley	EDEL International / Koxtons/Stage
47	Kneeling Roll	EDEL International / Koxtons/Stage
48	Badminton Pole set	EDEL International / Koxtons/Stage
49	UV treated Net	EDEL International / Koxtons/Stage

Sr. No.	Material	Approved Brand
50	Table Tannis Table	EDEL International / Koxtons/Stage
51	Moveable Volleyball Pole set	Ebaco /EDEL International / Koxtons/Stage
52	Moveable and Foldable Basket ball set	Ebaco / EDEL International / Koxtons/Stage
53	Gym equipment	Star-trac / Nautilus / Stair Master / Octane / Pannata / Cybex / Gym80 / Throwdown
54	Patch fittings	Assa abloy / Geze / Dorma / Yale / Ozone
55	Sliding soft close channels	Assa Abloy / Geze / Hafele / brasseley
56	Bolts ,Nuts, Washers	Kundan / Vardhaman / Hem Gandhi
57	Toughned Clear Glass	Saint Gobain / ASI / Modiguard
58	Clear Glass	Saint Gobain / ASI / Modiguard
59	Back Paint 5mm Glass	Saint Gobain / Asian Paints
60	Modular Toilet Cubical partition	Merino / Greenlam / Action Tesa
61	Urinal Partition	Merino / Greenlam / Action Tesa
62	Fabric Curtain	Cortina / De Décor / Pure / R R Décor / Greenteriors
62	Fabric	Cortina / De Décor / R R Décor / Greenteriors
63	Venetian / Vertical Blind / Roller / Blackout	Marvel / De Décor / MAC / Hunter Dougles / Vista
64	Marine Ply-Wood sheet	Century / Greenply / Durian / Kitply / Royale touch
65	High Pressure Laminate sheet (HPL)	Century / Greenlam / Merino / Fomica / Stylam
66	MDF Board	Century / Greenlam / Durian /Action tesa

Note: During execution the Client have right to reject any of the above brand. If any of the above brands is not available in the market, the product of similar specification shall get approved before procuring such material.

TENDER DOCUMENT
FOR
PLUMBING SYSTEM
AT
GUJARAT NATURAL FARMING SCIENCE UNIVERSITY

1.0 SCOPE OF WORK

1.1 Work under this contract shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely furnish all the plumbing and other specialized services as described hereinafter and as specified in the schedule of quantities and/or shown on the plumbing drawings.

1.2 Scope of Work generally shall include the area shown in the drawings attached.

1.3 Over & above Clause 1.1, the plumbing installation may include but not limited to the following:

a) Sanitary & CP Fixtures with all accessories.
b) Internal Water supply & Distribution
c) Internal & External Sewerage Collection & Disposal system
d) All hardware, supports, hangers required for complete installation
e) Civil work related to Plumbing Installation
f) The scope of 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.

2.0 SPECIFICATIONS

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.

2.1 Work under this contract shall be carried out strictly in accordance with specifications attached with the tender.

2.2 Item not covered under these specifications due to any ambiguity or misprints, or additional works, the work shall be carried out as per specifications of the latest applicable standards with latest amendments as applicable in the contract or as directed by Engineer in Charge.

2.3 Works not covered under Para 2.1 and 2.2 shall be carried out as per relevant Indian standards specifications or codes of practice.

2.4 Unless specifically otherwise mentioned, all the applicable codes and standards published by the Indian Standard Institution and all other standards which may be published by them before the date of receipt of tenders, shall govern in all respects of design, workmanship, quality and properties of materials and methods of testing, method of measurements etc.

2.5 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 there to or revisions thereof, if any, up to the date of receipt of tenders. 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.

2.6 For the items not covered under any of the specifications stated above, the work shall be executed as per manufacturers specifications/ General good engineering practice/ or as per direction of Engineer in charge and shall be carried out in a manner complying in all respects with the requirement of relevant byelaws of municipal corporation/ Development Authority etc. under the jurisdiction of which the work is to be carried out.

2.7 In case of any difference or discrepancy between specifications & the description of Schedule of Quantities, Schedule of Quantities shall take precedence. In case of any difference or discrepancy between specification and drawings, the drawings shall take precedence. In case any difference or discrepancy between the specifications for civil works and specification for Public Health Engineering works, specifications for civil works shall take precedence.

2.8 In case of any dispute arising out of the interpretation of any tender condition, the decision of Engineer-In-Charge shall be final and binding on the contractor.

2.9 Detail specification for Sanitary & CP fittings like model/ makes shall be selected by Architect/ Owner and the same shall be binding for execution.

2.10 All electrical installation shall comply with the requirements of relevant Indian Standards, Indian Electricity rules & Indian Electricity Act amended up to date & local bye laws.

3.0 CONTRACTOR'S RATES

3.1 Rates quoted are for all heights and depths required for this work.

3.2 All rates quoted must be for complete items inclusive of all such accessories, fixtures and fixing arrangements, nuts, bolts, hangers as are a standard part of the particular item except where specially mentioned otherwise.

3.3 All rates quoted are inclusive of cutting holes and chases in walls and floors and making good the same with cement mortar/ concrete of appropriate mix and strength as directed by Architect/ Engineer in Charge.

3.4 Rates quoted shall be inclusive of cost incurred in testing, commissioning of works and materials.

3.5 Rates quoted shall be inclusive of any rework to be carried in the system installation due to the instructions given by Statutory/ Approval authority.

3.6 For all the items/ equipments supplied free of cost by the Owner, the contractor's rate shall take care of transportation to the site, storage at site, installation, testing & commissioning of those items/equipments.

3.7 All rates quoted by the contractor under this contract shall including bailing or pumping out of all the water which may accumulate during the progress of work either through seepage, springs, rain or any other cause.

3.8 All rates quoted by the contractor shall include all miscellaneous civil work related to Plumbing work like excavation, refilling, timbering, bedding, encasing, etc. required as per actual site condition.

3.9 All water and electricity charges for testing and commissioning of the system shall be borne by the contractor.

3.10 In case of discrepancy/ calculation error between rate & amount quoted by the contractor, the quoted rate shall be considered as final to derive the amount.

4.0 DRAWINGS

4.1 Plumbing drawings are diagrammatic but shall be followed as closely as actual construction permits. Any deviations made shall be in conformity with the Architectural and other services drawings.

4.2 Architectural drawings shall take precedence over plumbing or other services drawings as to all dimensions.

4.3 Contractor shall verify all dimensions at site and bring to the notice of the Architect/ Engineer in Charges all discrepancies or deviations noticed. Architect/ Engineer in Charges decision shall be final.

4.4 Civil related details like tanks, basement channel, and plant room, sump, etc. to be read in conjunction with structure drawings. In case of any discrepancies, Contractor shall co-ordinate with other agencies & execute as per the best practices.

4.5 Large size details and manufacturers dimensions for materials to be incorporated shall take precedence over small-scale drawings.

4.6 Any drawings supplied with the tender shall be returned in good conditions along with the tender.

4.7 Any drawings issued by the Architect/ Engineer In Charges for the works are the property of the Architect/ Engineer In Charges and shall not be lent, reproduced or used on any works other than intended without the written permission of the Architect/ Engineer In Charges.

5.0 EXECUTION OF WORK

5.1 The contractor must get acquainted with the proposed site for the works and study specifications and conditions carefully before execution.

5.2 The work shall be carried out in conformity with the plumbing drawings and within the requirements of Architectural, HVAC, Electrical, Structural and other specialized services drawings.

5.3 On award of the work, contractor shall submit a program of construction in the form of a pert chart or bar chart for approval of the Architect/ Engineer in Charge. All dates and time schedule agreed upon shall be strictly adhered to, within the stipulated time of completion/ commissioning along with the specified phasing, if any.

5.4 The work shall be executed as per program approved by the Architect/ Engineer in Charge. If part of site is not available for any reason or there is some unavoidable delay in supply of materials stipulated by the owner/ or due to any other issue not pertaining to the contractor, the contractor shall draw attention to the owner & as per the mutual agreement, the program of construction shall be modified accordingly and the contractor shall have no claim for any extras or compensation on this account. Here Owner means the authorized person/ agency representing Owner/Client.

5.5 The contractor shall cooperate with all trades and agencies working on the site. The contractor shall ensure that all inserts, pipe lines embedded in structural members, sleeves, cutouts, etc. are placed in position in coordination with civil work as and when required. All holes, sleeves, cutouts shall be filled with best quality sealant to make leak proof joint. Location & size of core cutting of the floor slabs in case of suspended plumbing shall be co-ordinated with civil contractor. However, core cutting work is to be carried out by Civil Contractor or any other agency.

5.6 The contractor shall take instructions from the Engineer In charge regarding collection and stacking of material in any place with lockable arrangement. For damage/ theft of any material, Contractor shall be hold responsible. No Excavated earth or Building material shall be stacked on areas where other buildings, roads, services, compound walls, etc are to be constructed.

5.7 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.

5.8 The installation of the sanitary fixtures and fittings shall be as per the shop drawings approved by the Architect/ Engineer in Charge/ Consultant. The fixtures in the trial assembly can be re-used for final installation without any additional payments for fixing or dismantling of the fixtures.

5.9 All gaps between wall/ floor and sanitary vessels shall be filled with sanitary grade sealant. CP Brass or SS screws shall be used for fixing sanitary fixtures and accessories in toilet, bath, pantry and kitchen area.

5.10 While carrying out pipeline work, in case the contractor encounters any Interference with other services, such as cable, conduits, etc. he shall take sufficient precautions in order to

prevent any damage to them. If any damage occurs it shall be rectified to its original condition at his own cost to the satisfaction of Engineer-In-Charge.

5.11 The contractor carrying out the construction work shall take effective measures to carefully open out all existing channels, culverts, bridges, pipelines, conduits, water courses, sewer, drains, electrical cables, transmission lines and their supports and all works buried or otherwise where such services have to be interfered with the purpose of the construction of the works. He shall provide and arrange all necessary temporary supports and diversions if necessary across/ under/ even through along sides of the trenches and all other parts of construction work for all such channels, culverts, bridges, pipe lines, conduit

5.12 The contractor shall arrange to carry out all works with least interference practicable with public footpath and vehicular traffic and with existing waste water or storm water drainage arrangements and provide all necessary road barriers, fences, notices, lights, gangways, access crossings, diversions for traffic, temporary drains, dewatering channels, chutes pumping or water lifting arrangements and all other facilities for the proper execution of the works to the approval and satisfaction in all respects of the Engineer-in-Charge. Any work carried out by the contractor in this connection shall be deemed as temporary works incidental to the construction work.

5.13 For any free issue items by Owner, the contractor shall maintain the same properly & install as per good engineering practice.

5.14 No structural member shall be chased or cut without the written permission of the Architect/ Engineer in Charge/ Engineer in charge.

5.15 The work shall be executed in a manner complying in all respects with requirements of relevant bye-laws of the municipal corporation/ Development Authority/ Applicable Statutory Authority the jurisdiction of which the work is to be executed or as directed by the Engineer-In-Charge.

5.16 All plumbing services shall be handed over to Engineer-In-Charge complete in all respects. Incomplete work will not be taken over. Any loss or damage to these services due to any reasons by anybody whatsoever before handing over will be at contractors risk and cost, Any damage to any structural, finishing work done during the testing or rectification shall be made good by the contractor at his own cost and risk.

6.0 MATERIALS & WORKMANSHIP

6.1 All materials used in the works shall conform to the list of approved vendor in tender specifications. The approved samples shall be maintained at site till the completion of work.

6.2 As far as possible materials bearing I.S. certification marks shall be used with the approval of the Architect/ Engineer in Charge/ Engineer in charge.

6.3 Unless otherwise specified and expressly approved in writing by the Architect/ Engineer in

Charge, materials of makes and specifications mentioned with tender shall be used. In case of any items, list of approved vendor is not given; the contractor shall submit his recommendation to Engineer in charge with proper technical back up justifying the selection.

6.4 Workmanship and general finish shall be of first class quality and in accordance with best workshop practice. All similar items of the Plant and their component parts shall be completely interchangeable.

6.5 Spare parts shall be manufactured from the same materials as the originals and shall fit all similar items.

6.6 Machining fits on renewable parts shall be accurate and to specified tolerances so that replacements made to may be readily installed.

6.7 All equipment shall operate without excessive vibration and with minimum noise.

6.8 All revolving parts shall be truly balanced both statically and dynamically so that when running at normal speeds at any load up to the maximum there shall be no vibration due to lack of balance.

6.9 All parts which can be worn or damaged by dust shall be totally enclosed in dust proof housings

6.10 All materials selected in the work shall be most suitable for duty concerned, free from imperfections, selected for long life and minimum maintenance.

6.11 All necessary accessories required for satisfactory and safe operation of the Plant shall be supplied by the Contractor unless it is specifically excluded from his scope.

6.12 All valves shall be closing on clockwise rotation of the hand wheel. The effort required to close/ open under all operating conditions shall be limited to 7 kg. The direction of opening/ closing shall be cast on the hand wheel.

6.13 All flanges shall be drilled in accordance with requirements of IS: 1538. All flanges shall be full or spot faces on the back side. The flange thickness shall be uniform throughout. Flange outside periphery shall be concentric with the bore. Flanges shall be finished smooth on periphery also Castings and fabricated materials shall be finished smooth all over.

7.0 INSPECTION AND TESTING OF MATERIALS

7.1 Contractor shall be required, if requested, to produce manufacturers test certificate for the particular batch of materials supplied to him. The tests carried out shall be as per the relevant Indian standards.

7.2 Testing charges including incidental charge and cost of sample for testing shall be borne by the contractors for all mandatory tests.

7.3 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.

7.4 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.

7.5 The materials should pass all tests and tolerance in dimensional, chemical, physical properties should be within the limit as stipulated in relevant I.S. for acceptance. Such materials will be accepted as standard.

7.6 Payments shall be restricted to standard unit mass, or as specified in the schedule, without making any cost adjustment towards mass or any other properties provided the material pass all the tests and tolerance are within the specified limit.

7.7 For examination and testing of materials and works at the site contractor shall provide all testing and gauging equipment necessary but not limited to the followings:

7.8 a) Theodolite b) Dumpy level c) Steel tapes d) Weighing machine e) Plumb bobs, spirit levels, Hammers f) Micrometers g) Thermometers, Stoves h) Hydraulic test machine i) Smoke test machine.

7.9 All such equipment shall be tested for calibration at any approved laboratory, if required by the Architect/ Engineer in Charge.

7.10 All testing equipment shall be preferably located in special room meant for the purpose.

8.0 MOCK UP

8.1 The contractor shall install all pipes, fixtures, clamps and accessories and fixing devices in mock-up shaft and room so constructed as directed by Architect/ Engineer in Charge without any cost. The materials used in the mock-up may be reused in the works if found undamaged.

8.2 The contractor shall have to assemble at least one set of each type of sanitary fixtures and CP fittings in order to determine precisely the required supply and disposal connections. Relevant instructions from manufacturers shall be followed as applicable. This trial assembly shall be developed to determine the location of puncture holes, holding devices etc. which will be required for final installation of all sanitary fixtures and fittings. The above assembly shall be subject to final approval by the Architect/ Engineer in Charge/ Engineer In charge.

8.3 Any tiles or finished surfaces or floors damaged by the contractor while doing his work shall be made good with new tiles or other finishing material. No payment shall be admissible for such repairs. The Architect / Engineer in Charge may, at his discretion get the damaged work repairs to the contractor.

9.0 MATERIALS SUPPLYING BY OWNER

9.1 The contractor shall verify that all materials supplied by the Owner conform to the specifications of the relevant item in the tender. Any discrepancy found shall be brought to the notice of the Architect /Engineer in charge.

9.2 If any materials issued to the contractor, free of cost, are damaged or pilfered, the cost of the same shall be recovered from the contractor on the basis of actual cost to owner which shall include all freight and transportation, excise duty, sales tax, octroi, import duty etc.

10.0 REFERENCE POINTS

10.1 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 the work.

10.2 All such reference points shall be in relation to the levels and locations given in the Architect/ Engineer in Charge and plumbing drawings.

11.0 REFERENCE DRAWINGS

11.1 The contractor shall maintain one set of all construction drawings issued to him as reference drawings. These shall not be used on site.

11.2 All corrections, deviations and changes made on the site shall be shown on these reference drawings for final incorporation in the completion (as built) drawings. All changes to be made shall be initialed by the Engineer in charge.

11.3 One complete set of construction drawings shall be made available to the execution engineer & shall be maintained in good condition throughout the execution activities.

12.0 SHOP DRAWINGS

12.1 The contractor shall submit to the Architect/ Engineer In Charge four copies of the shop drawings.

12.2 Shop drawings shall be submitted under following conditions:

a) Showing any changes in layout in the plumbing drawings.
b) Foundation details, Nozzle Orientation, Equipment layout and piping, wiring diagram.
c) Manufacturer's or contractor's fabrication drawings for any materials or equipment supplied by him.

12.3 The contractor shall submit four copies catalogues, manufacturers drawings, technical data sheet, equipment characteristic data or performance charts as required by the Architect/ Engineer In Charge.

13.0 SITE CLEARANCE AND CLEANUP

13.1 The contractor shall, from time to time clear away all debris and excess materials accumulated at the site.

13.2 After the fixtures, equipment and appliances have been installed and commissioned, contractor shall clean-up the same and remove all plaster, paints stains, stickers and other foreign matter of discoloration leaving the same in a ready to use condition.

13.3 On completion of all works, contractor shall demolish all stores, remove all surplus materials and leave the site in a broom clean condition, failing which the same shall be done at contractors risk and cost.

14.0 TESTING

14.1 Piping and drainage works shall be tested as specified under the relevant clauses of the specifications.

14.2 Tests shall be performed in the presence of the Engineer In Charge. The engineer in charge shall issue a certificate for approved testing of all systems duly signed & stamped.

14.3 All materials and equipment found defective shall be replaced and whole work tested to meet the requirements of the specifications.

14.4 Contractor shall perform all such tests as may be necessary and required by the local authorities to meet Municipal or other bye-laws in force.

14.5 Contractor shall provide all labour, equipment and materials for the performance of the test.

14.6 After completion of work and during the maintenance liability period of contract, the work shall be subjected to “Post construction and testing”. In case, if the materials incorporated in the work are found to be inferior, though the sample collected from the materials might have been passed at the time of execution, it shall be the responsibility of the contractor to replace the same without any cost to the Owner failing which the Owner may rectify the same at the risk and cost of the contractor or the Owner may accept the same as sub standard, and cost be adjusted from the outstanding security deposit as per the terms and condition of the contract for the work.

15.0 LICENSE AND PERMITS

15.1 Contractor must hold a valid plumbing license issued by the Municipal authority or other competent authority under whose jurisdiction the work falls.

15.2 Contractor must keep constant liaison with the Municipal authority and obtain approval of all drainage and water supply works carried out by him.

15.3 Contractor shall obtain, from the municipal authority, completion certificate with respect to his work as required for occupation of the building.

15.4 All inspection fees or submission fees paid by the contractor shall be reimbursed by the Owner on production of valid official receipts

16.0 HANDING OVER DOCUMENTS

16.1 On completion of work, contractor shall submit one complete set of as built drawings in editable soft copy and two hard prints of 'as built' drawings to the Engineer in Charge. These drawings shall have the following information (whichever is applicable):

a) Run of all piping & diameters on all floors, terrace and vertical stacks.
b) Ground and invert levels of all drainage pipes together with location of all manhole and connections up to outfall.
c) Run of all water supply lines with diameters, locations, of control valves, access panels inside the utilities.
d) Location of all mechanical equipment with layout and piping connections & location of electrical panel for the same.
e) Location & capacity of Underground / Overhead tanks

16.2 Contractor shall provide four sets of catalogues, performance data and list of spare parts together with the name and address of the manufacturer for all electrical and mechanical equipment provided by him.

16.3 All 'warranty cards' given by the manufacturers shall be handed over to the Architect/ Engineer in Charge.

16.4 Contractor shall provide Operation and Maintenance manual of all major Electro-mechanical equipments.

16.5 All test certificates of materials & testing at manufacturer works shall be submitted in one set of hard copy.

16.6 All site performance test certificates approved by Engineer in charge shall be submitted in one set of hard copy.

17.0 APPLICABLE CODES AND STANDARDS:

17.1 Plumbing system design shall conform to plumbing design codes like National Building code–2005, Part 9, Section 1, CPHEEO Manual, Handbook on Water supply & Drainage- SP 35, Public Health Engineering Handbook, Uniform Plumbing Code for India.

17.2 All equipment, supply, erection, testing and commissioning shall comply with the requirements of Indian Standards and code of practice given below as amended up to the date of submission of Tender. All equipment and material being supplied shall meet the requirements of BIS and other relevant standard and codes.

LIST OF INDIAN STANDARDS FOR PLUMBING

17.3 The following IS codes shall be referred in execution of PH Engineering works whichever applicable.

IS CODE	SUBJECT
27 - 1992	Specifications for Pig Lead
269- 1989	Specifications for 33 grade Ordinary Portland Cement
407- 1981	Brass tubes for General purposes
456- 2000	Code of practice for Plain & Reinforced concrete.
458- 2003	Specifications for Concrete Pipes.
554- 1999	Dimensions for pipe thread where pressure tight joints are required.
636- 1988	Fire fighting hose ,rubber lined or fabric reinforced rubber lined woven –jacketed
638- 1979	Sheet rubber jointing & rubber insertion jointing
651- 1992	Specifications for Salt glazed stoneware pipes & fittings.
771 (Pt. I &VII)	Glazed Fire Clay Sanitary Appliances.
771- 1979 (Pt. I)	General requirements
771- 1985 (Pt. II)	Specific requirements of kitchen & laboratory sinks
771- 1979 (Pt. III/ Sec 1)	Specific requirements of urinals (section 1- Slab urinals)
771- 1985 (Pt. III/ Sec2)	Specific requirements of urinals (section 2- Stall urinals)
771- 1979 (Pt. IV)	Specific requirements of postmortem slabs.
771- 1979 (Pt. V)	Specific requirements of shower trays
771- 1979 (Pt. VI)	Specific requirements of bed pan sinks
771- 1981 (Pt. VII)	Specific requirements of slop sinks
774- 1984	Flushing cistern for water closet and urinals.
775- 1970	Cast iron brackets and supports for wash basin and sink.
778- 1984	Specifications for copper alloy gate & Globe check valves for water works
779- 1994	Water meters (domestic type)
781- 1984	Specifications for cast copper alloy screw down bib taps & stop cocks for water services
782- 1978	Specification for Caulking lead.
783- 1985	Code of practice for laying concrete pipes.
784- 2001	Pre-stressed concrete pipes.
884- 1985	Fire aid hose reel for firefighting (for fixed installation)
901 - 1988	Specification for couplings, double males & double female, instantaneous pattern for Fire Fighting
902 - 1992	Specification for suction hose couplings for Fire Fighting purposes.
903 - 1993	Couplings for fire hose delivery, branch pipe, nozzles specification
904 - 1983	Specification for 2 way and 3 way suction collecting heads for Fire

IS CODE	SUBJECT
	Fighting purposes.
905 - 1980	Specification for delivery breechings, dividing and collecting instant tenuous pattern for Fire Fighting
906 - 1988	Specification for revolving branch pipe for Fire Fighting
907 - 1984	Specification for suction strainer, cylindrical type for Fire Fighting purposes.
908- 1975	Fire Hydrants, Stand post type
909- 1992	Specifications for underground fire hydrants, sluice valve type
940 - 1989	Portable Fire Extinguisher, water Type (Gas Cartridge) - Specification
941- 1985	Specification for Blower and Exhauster for Fire Fighting.
1172- 1993	Code of basic requirements for water supply, drainage and sanitation
1200-1979 (Pt. 16)	Method of measurements for Laying of water and sewer lines including appurtenant items.
1200-1981 (Pt. 19)	Method of measurements for Water supply, plumbing and drains.
1230	Specifications for CI Rain Water pipes
1239- 2004 (Pt I)	Specifications for Mild steel tubes
1239- 1992 (Pt. II)	Specifications for Mild steel Tubular & other wrought steel pipe fittings
1300- 1994	Phenol molding material specification
1536- 2001	Specifications for Centrifugally cast iron (spun) pressure pipes for water, gas and sewage
1537- 1976	Specifications for Vertically cast iron pressure pipes for water, gas and sewage
1538- 1993	Cast iron fittings for pressure pipes for water, gas and sewage
1700- 1973	Drinking fountains
1701- 1960	Combination valve , mixing valves
1703- 2000	Ball valve (horizontal plunger type) including floats for water supply.
1711- 1984	Self closing taps.
1726- 1991	Cast iron manhole covers and Frames.
1729- 2002	Cast /ductile iron drainage pipes & fittings for over ground NP pipeline S/S series.
1742- 1983	Code of practice for building drainage
1795- 1982	Pillar taps for water supply purposes
1879	Malleable Cast Iron Pipe Fittings
1978- 1982	Specification for line pipe (M S Seamless)
1979- 1985	Specification for high test line pipe
2065- 1983	Code of practice for water supply in buildings.
2097 - 1983	Specification for foam making branch pipe.
2104- 1981	Water meter boxes (domestic type)
2171 – 1999	Specification for portable fire extinguisher, dry powder

IS CODE	SUBJECT
	(Cartridge Type)
2190- 1992	Code of practice for selection ,installation & maintenance of portable first-aid fire extinguishers
2267- 1995	Polystyrene molding and extension materials – specification
2326- 1987	Automatic flushing cistern for urinals
2373	Specification for Water Meter (Bulk type)
2379- 1990	Color code for identification of pipe lines.
2401- 1973	Code of practice for selection, installation & maintenance of domestic water meters
2470 (Pt. I to II)	Code of practice for installation of septic tanks
2470- 1985 (Pt. I)	Design criteria & construction
2470- 1985 (Pt. II)	Secondary Treatment & disposal of septic tank effluent
2527- 1984	Code of practice for fixing rain water gutters and down pipes for roof drainage.
2546 - 1974	Specification for galvanized Mild Steel Fire bucket.
2548- 1996(Pt. I)	Plastic water closet seats and covers.
2548- 1996(Pt. II)	Plastic water closet seats and covers.
2556 (Pt. 1 to XV)	Specification for Vitreous (Vitreous China) sanitary appliances.
2556- 1994 (Pt.1)	General requirements
2556- 1994 (Pt.2)	Specific requirements of wash down water-closets
2556- 2004 (Pt.3)	Specific requirements of squatting pans
2556- 2004 (Pt. 4)	Specific requirements of wash basins
2556- 1994 (Pt.5)	Specific requirements of laboratory sinks
2556- 1995(Pt.6)	Specific requirements of urinals & partition plate
2556- 1995 (Pt.7)	Specific requirements of accessories for sanitary appliances
2556- 1995 (Pt.8)	Specific requirements of pedestal close coupled & wash down and siphon water closets
2556- 2004 (Pt.9)	Specific requirements of pedestal type bidets
2643- 1999	Type Threads where pressure tight joints are not mase on the threads dimension, tolerances and designation
2692- 1989	Specification for Ferrules for water services.
2800- 1991 (Pt. I)	Construction of tube well
2800- 1979 (Pt. II)	Testing of tube well
2878 - 2004	Fire Extinguisher, Carbon Dioxide Type (Portable and Trolley Mounted) – Specification.
2951 (Pt. I to II)	Recommendation for estimate of flow of liquids in closed conduits.
2951- 1965 (Pt. I)	Head loss in straight pipes due to frictional resistance
2951- 1965 (Pt. II)	Head loss in valves & fittings.
3006- 1979	Specification for Chemically resistant glazed S.W. pipes and Fitting
3076- 1985	Low density polyethylene pipes for potable water supply
3114- 1994	Code of practice for laying of Cast Iron pipes.

IS CODE	SUBJECT
3311- 1979	Waste plug & its accessories for sinks & wash basins.
3328- 1993	Quality tolerances for water for swimming pools
3389- 1994	Urea formaldehyde molding materials
3486- 1966	Specification for Cast iron spigot and socket drain pipes
3489- 1985	Specifications for enameled steel bath tubs
3589- 2001	Specifications for steel pipes for water & sewage (168.3 to 2540 mm outside dia.)
3597- 1998	Method of test for concrete pipes.
3844- 1989	Code of practice for installation and maintenance of internal fire hydrants Hose reels in premises.
3950- 1979	Specification for Surface boxes for sluice valve.
3989- 1984	Centrifugally cast (spun) iron spigot and socket soil, waste and ventilating pipes, fittings & accessories.
4038- 1986	Foot valves for water works purposes.
4111 (Pt. I to V)	Code of practice for ancillary structures in sewage system.
4111- 1986 (Pt. I)	Manholes
4111- 1985 (Pt. II)	Flushing tanks
4111- 1985 (Pt. III)	Inverted siphon
4111- 1968 (Pt. IV)	Pumping stations & pumping mains (rising mains)
4111- 1993 (Pt. V)	Tidal out-falls
4120- 1967	Tubs and baths.
4127- 1983	Code of practice of laying of glazed stone ware pipes.
4308 - 2003	Dry Chemical Powder for Fighting B & C class Fires– Specification.
4350- 1967	Specification for concrete porous pipes for under drainage.
4733- 1972	Methods of sampling & test for sewage effluents
4736- 1986	Specification for hot –dip zinc coating on mild stele tubes.
4854 (Pt. I to III)	Glossary terms for valves and their parts
4854- 1969 (Pt. I)	Screw down stop, check & gate valves & their parts
4854- 1968 (Pt. II)	Plug valves & cocks & their parts
4854- 1974 (Pt. III)	Butterfly valves
4927- 1992	Unlined flax canvass hose for fire fighting
4947 - 1985	Specification for gas cartridge for use in Fire extinguishers.
4984- 1995	Specifications for HDPE pipes for water supply
4985- 2000	Specifications for un plasticized PVC pipes for potable water supplies
5290- 1993	Specifications for Landing valves.
5312 (Pt. I)	Swing check type reflux (non return) valves
5312- 1984 (Pt. I)	Reflux (non return) valves – single door pattern
5329- 1983	Code of Practice for sanitary pipe work above ground for building
5330- 1984	Criteria for design for anchor blocks for pen-stocks with expansions joints.
5382- 1985	Specifications for rubber sealing rings for water, gas & sewer mains
5455- 1969	Cast iron steps for manholes

IS CODE	SUBJECT
5600- 2002	Specifications for Sewage and drainage pumps
5611- 1987	Code of Practice for waste stabilization ponds (Facultative type)
5714- 1981	Specifications for Hydrant stand-pipe for fire fighting
5822- 1994	Code of Practice for laying of welded steel pipes for water supply
5961- 1970	Specifications for CI grating for drainage purposes
6234 - 2003	Portable fire Extinguisher water Type (Stored Pressure) – Specification.
6279- 1971	Equipment for grit removal
6280- 1971	Sewage screens
6295- 1986	COP for water supply & drainage in high altitude & / or sub-zero region
6392- 1971	Steel pipe flanges
6411- 1985	Specifications for gel coated glass fiber reinforced polyester resin bath tubs
6418- 1971	Cast Iron & malleable flanges for general engineering Purpose
6494- 1988	COP for water proofing of underground water tanks & swimming pools
6587- 1987	Specifications for Spun hemp yarn
7181- 1986	Horizontally Cast Iron Double Flanged pipe for water, gas & sewage.
7231- 1994	Specifications for Plastic Flushing Cisterns for water closet & urinals
7558- 1974	Code of Practice for domestic hot water installations
7634 (Pt. I to III)	Code of Practice for Plastic pipe work for potable water supplies
7634- 1975 (Pt. I)	Choice of materials & general recommendations
7634- 1975 (Pt. II)	Laying & jointing polyethylene (PE) pipes
7634- 2003 (Pt. III)	Laying & jointing un plasticized PVC pipes
7740- 1985	Code of Practice for road gullies
7834 (Pt. I to VIII)	Injection molded PVC socket fittings with solvent cement joints for water supplies
7834 - 1987(Pt. I)	General requirements
7834- 1987 (Pt. II)	Specific requirements for 45 0 elbows
7834- 1987 (Pt. III)	Specific requirements for 90 0 elbows
7834- 1987 (Pt. IV)	Specific requirements for 90 0 tees
7834- 1987(Pt. V)	Specific requirements for 45 0 tees
7834- 1987 (Pt. VI)	Specific requirements for sockets
7834- 1987(Pt. VII)	Specific requirements for unions
7834- 1987 (Pt. VIII)	Specific requirements for caps
8008 (Pt. I to VII)	Injection molded HDPE fittings for potable water supplies
8008- 2003 (Pt. I)	General requirements for fittings
8008- 1976 (Pt. II)	Specific requirements for 90 0 bends
8008- 2003 (Pt. III)	Specific requirements for 90 0 tees
8008- 2003 (Pt. IV)	Specific requirements for reducers
8008- 2003 (Pt. V)	Specific requirements for ferrule reducers

IS CODE	SUBJECT
8008- 2003 (Pt. VI)	Specific requirements for pipe ends
8008- 2003 (Pt. VII)	Specific requirements for sandwich flanges
8090- 1976	Coupling, branch pipe, nozzle used in hose reel tubing for fire fighting
8329- 2000	Centrifugally cast (spun) ductile iron pressure pipes & fittings for water, gas & sewage
8413 (Pt. I)	Requirements for biological treatment equipment
8718- 1978	Specifications for vitreous enameled steel kitchen sinks
8727- 1978	Specifications for vitreous enameled steel wash basin
8835- 1978	Guideline for planning and design of surface drains.
8931- 1993	Specifications for copper alloys Fancy single taps, combination tap assembly & stop valves for water services
9140- 1996	Method of sampling of vitreous & fire clay sanitary appliances
9338- 1984	Specifications for Cast Iron screw down stop valves and stop & check valves for water works purposes
9739- 1981	Specifications for Pressure reducing valves for Domestic water supply system.
9758- 1981	Flush valves and Fittings for water closets and urinals
9762- 1994	Specifications for polyethylene floats for float valves
9763- 2000	Specifications for Plastic Bib taps, pillar taps, angle valves and stop valves for hot & cold water service.
10221- 1982	Code of practice for coating and wrapping of underground M.S. steel pipeline,
10500- 1991	Specification of Drinking water
11189- 1985	Method of tube well development
11606 - 1986	Method for sampling of cast iron pipes and fittings.
11632 - 1986	Rehabilitation of Tube well
12183- 1987 (Pt. I)	Code of practice for Plumbing in multi-storied buildings (for water supply)
12231 - 1987	UPVC pipes for section & delivery lines of agricultural pumps– Specification.
12235 - 1986	Method of test for UPVC pipe for potable water supply
12288 - 1987	Code of practice for use and laying of Ductile Iron pipes.
12469 - 1988	Specifications for pumps
12592- 2002	Precast concrete frame & cover (SFRC frame & cover)
12701-1996	Specifications for rotational molded polyethylene water storage tanks
12709 - 1994	Glass fiber reinforce plastic(GRP) pipes, joints & fittings for use for potable water supply – Specification.
12818 - 1992	Spn. for UPVC ribbed screen casing & plain casing pipes for bore / tube well
12820 - 1989	Dimensional Req. of Rubber Gaskets for Mechanical Joints & push in joints for use with Cast Iron Pipes & fittings for carrying water, Gas & sewage.

IS CODE	SUBJECT
13095 - 1991	Butterfly valves for general purposes
13114 - 1991	Spn. for forged brass gate, globe & check valves for water works purposes
13382-2004	Cast Iron specials for mechanical & push-on flexible joints for pressure pipelines for water, gas & sewage
13592- 1992	Specifications for PVC soil, waste & rain water (SWR) including ventilation pipes
13593 - 1992	UPVC pipes fittings for use with section and delivery lines for Agricultural pumps – Specification.
13916 – 1994	Code of practice for installation of GRP piping system.
13983-1994	Specifications for stainless steel kitchen sinks & drain boards for domestic purpose
14333-1996	Specification for HDPE pipes for sewerage system.
14402-1996	GRP pipes, joints & fittings – Specification.
14735-1999	UPVC injection molded fittings for UPVC – SWR pipes – Specifications.
IS CODE	SUBJECT
14845- 2000	Resilient seated cast iron air relief valves for water works purposes – Spn
14846- 2000	Specifications for sluice valve for water works purposes (50 to 1200 mm size)
15265 – 2003	Specifications for flexible PVC pipes or polymer reinforcement thermo plastic hoses for suction and delivery lines for Agricultural pumps.
15328 – 2003	UPVC non pressure pipes for use in underground drainage and sewerage system – Specifications.
15450- 2004	Polyethylene/Aluminum/Polyethylene composite pressure pipes for hot and cold water supplies – Specifications.

Section 1.00 Sanitary Installation

1.01 Providing, fixing, testing and commissioning of White Vitreous China coupled type Wall Mounted Water Closet of approved shape with C.P. bolts, nuts, C.I. chair or other hanging arrangements, C.P. brass screw, washer with all accessories. including providing and fixing exposed cistern of approved material with dual flush fitting of Flushing capacity 2 Liter/4.5 Liter including brass / SS screws and washer complete. PVC WC connector (straight or bend type) with rubber lip ring. Including 110 mm dia PVC pipe / bend of required length, flexible hose with angle valve and proper connection complete as required. Including cutting & making good the walls, floors, slab wherever required including all necessary accessories and consumables, including seat cover and cistern fittings, nuts bolts and gasket etc. complete as per specification/drawings and as directed by Engineer In Charge.

1.0 MATERIAL

1.1 European W.C. shall be wash down type single or double siphonic type, floor or wall mounted set with integral 'P' or 'S' Trap set & shall conform to IS 2556 (Part I & II). The trap shall have minimum water seal of 50 mm.

1.2 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 integral flushing rims of self draining type.

1.3 Each WC shall be provided with 110 mm (OD) Pan Connector connecting ceramic outlet of WC to soil pipe.

1.4 Each European W.C. set shall be provided with a solid plastic seat with cover in conformity to IS: 2548 Part I & II & of colour given in the schedule of quantities. They shall be made of molded from PP heavy duty material which shall be tough and hard with high resistance to solvents and shall be free from blisters and other surface defects & shall have rubber buffers and chromium plated hinges.

1.5 Each Anglo Indian W.C. shall be flushed with concealed/ exposed flushing cistern or an exposed or concealed type manual flush valve or sensor faucet as specified in bill of quantities. Material of cistern shall be Porcelain/ HDPE or as specified in schedule of quantities. Valves shall be of chromium plated brass. The flushing system shall be provided with all inlet/ outlet & overflow connections.

1.6 Optionally, European W.C. shall be with coupled cistern directly mounted on WC with single or dual flow discharge as mentioned in schedule of quantities

2.0 FIXING

2.1 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.

2.2 WC shall be fixed to floor using SS or non ferrous screws. Wall hung W.C. shall be supported by C.I. floor mounted chair with 75 mm. long 6.5 mm. diameter counter sunk bolts and nuts embedded in the wall concrete using rubber or fiber washers so as not to allow any lateral displacement. The pan, soil pipe shall be jointed in 1:1 Cement Mortar with hemp yarn caulked.

2.3 Joints between W.C. and flush pipe shall be made with a putty or white lead and linseed oil and caulked well or with an approved rubber joint.

2.4 The gap between W.C. and floor shall be finished with white/matching cement and sand as directed.

2.5 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 of flange. Seat shall be fixed in level by providing the washers of rubber with non ferrous or stainless steel washer to bolt. Plastic seat shall be so fixed that it remains absolutely stationary in vertical position without falling down on the W.C.

2.6 Each WC shall be fixed with concealed/ exposed/ coupled flushing cistern/ manual flush valve/ sensor faucet with required brackets, hardware & accessories.

3.0 RATES

3.1 European type water closet with an integral `P` or `S` trap & plastic seat cover, etc.
3.2 Flushing Cistern/ Flush Valve with fixing brackets (only if called in BOQ).
3.3 Cast Iron Chair/ Bracket, Screws, Hardware.
3.4 Jointing & fixing material.
3.5 Cutting slab/ beam etc. wherever required. And making all damages good to original condition after completion of work.
3.6 Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
3.7 Testing the entire system and rectification of defect if any.
3.8 All necessary labor, material and use of tools.

4.0 MODE OF MEASUREMENT

4.1 The measurement shall be for each unit of W.C. fixed.

5.0 MODE OF PAYMENT

5.1 The contract rate shall be for each unit of W.C. fixed.

Concealed flushing cistern

1.0 Materials:

The cistern shall be of approved make, and color with dual flush type with inbuilt actuator and top cover and accessories Raw material of cistern body shall be of virgin polypropylene with critical and functional parts molded from Engineering grade ABS, Acetyl, Nylon and Nylon glass. The float shall work on clock valve mechanism with concealed air pocket to give upward thrust of 75 gm by Archimedes principle. Derlin valve made from an Acetyl compound shall withstand an inlet pressure up to 20 kg/cm^2. Main rubber valve shall be of parabolic design on ball and socket joint for better seal. Valve seat shall be of engineering grade ABS plastic for long scratch free life. Cistern shall be of 6 liter capacity and flow can be adjusted from 3 to 6 liters. It shall conform to IS 7231.

Polyethylene flush pipe shall be low density confirming to IS 3076 or high density confirming to IS 4984 or UPVC pipe confirming to IS 4965 of 40 mm outer diameter.

PVC water inlet connection of approved make as specified in item, and shall conform to IS specifications and shall be of standard pattern 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.)

2.0 Workmanship:

The open type cistern shall be fixed firmly as per manufacturer's recommendations. 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. The flushing cistern shall be connected to the closet by means of PVC flush bend using Indian rubber adapts joint. The flush pipe shall be securely connected to the cistern outlet by means of coupling nut made of any non-corrosive materials non-ferrous metal or galvanized steel. The flush pipe from the cistern shall be connected to the closet by means of solvent cement.

The inlet end of the cistern shall be connected to the water distribution pipe through a angular stopcock and braided hose pipe. The cistern shall be provided with an overflow pipe with mosquito proof jali at end. The whole installation shall be tested for leak-proof joints and satisfactory functioning.

3.0 Mode of measurement:

1) Supply and fixing flush tank, flush pipe, water inlet flexible connection without cost of angular stop cock.
2) Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
3) Cutting hole in wall / slab / beam etc. wherever required and making good the same to original condition after fixing.
4) Cost of jointing materials
5) Testing the entire system and rectification of defects, if any.
6) The rate shall be for a unit of one number and include the cost of all labour and material as specified in item for fixing etc. complete, including testing and commissioning.

1.02 Providing, fixing, testing & Commissioning of approved make wash basin including making water and drain connections, CP wall and sleeve flanges, etc., complete with all respect. The wash basin shall consist of the following and shall be with or without hot water supply. Heavy type concealed M.S.wall brackets with 3 hole fixity and SS screws to support the basin or hitech supports, 32 mm dia. CP waste Coupling, 32 mm dia.CP bottle trap with extention pipe, 1 nos 15 mm Angle Cock with 450 mm long CP inlet connection pipe. The rate includes all necessary connection charges as per product detail to the satisfaction and as directed by the Engineer In Charge.:

1.0 MATERIAL

1.1 Wash basin shall conform to IS 2556 (Part IV) and I.S. 771-1979 & shall be of one piece construction.

1.2 Wash basin shall be provided with single tap/ double tap holes of size 28 mm square or 30 mm rounded.

1.3 Half/ full Pedestal shall be of same glazing as that of wash basin.

1.4 Each basin shall be provided with 32mm diameter C.P. waste coupling with overflow, pop-up waste or rubber plug and chain as given in the schedule of quantities, 32mm diameter C.P. Brass bottle trap with C.P. pipe to wall, flexible to angle cock and flange.

1.5 Waste Coupling shall confirm to IS 3311, and as specified in the item and of approved make. Waste fittings shall be of with thickness of 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 defect. 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.

1.6 The bottle trap shall be as specified in the item and of approved make. The bottle-trap shall be provided with a CP brass extension piece to the wall flange on one hand and on the other with a rubber adopter for waste connection.

1.7 Bottle trap shall be of thickness of 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 be 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.

1.8 PVC water inlet connection shall conform to IS specifications and shall be of standard pattern with flexible hose 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.)

1.9 Each basin shall be provided with manual taps/ mixing (mono or thermostatic type) fitting/ sensor tap as specified in the schedule of quantities.

2.0 FIXING

2.1 Wash basin shall be wall bracket mounted or half/ full pedestal mounted or over/ under counter mounted as specified in schedule of quantities or as directed by Architect.

2.2 Wash basin shall be securely fixed to wall with R.S. or C.I. brackets and clips embedded in cement concrete (1:2:4) block of 100 x 75 x 150 mm.

2.3 The MS angle shall be provided with two coats of red oxide primer and two coats of synthetic enamel paint of make, brand and colour as approved by the Architect/ Consultants.

2.4 In case of Counter mounted, Oval/ Round shape wash basins are required to be installed in RCC platform/ counter with stone topping either fully sunk in stone top or flush on stone topping.

2.5 The wall plaster on seat shall be cut to rest over the top edge of basin so as not to leave any gap for water seepage through between wall plaster and skirting of basin. The gap between wall & basin shall be finished with matching white cement.

3.0 RATES

3.1 Wash basin with/ without pedestal.

3.2 Brackets, Accessories & Hardware.

3.3 CP Waste Coupling, Bottle trap, flexible pipe.

3.4 Angle cock, Taps/ Sensor faucet, Mixer (if called in BOQ).

3.5 Jointing & fixing material.

3.6 Cutting hole/ wall wherever required and making all damage good to original condition after completion of work.

3.7 Painting all the metallic parts with two coats of flat oil paint over a coat of primer.

3.8 Testing the entire system and rectification of defects if any.

3.9 All necessary materials, labor and use of tools.

4.0 MODE OF MEASUREMENT

4.1 The measurement shall be for each unit of Wash basin fixed.

5.0 MODE OF PAYMENT

5.1 The contract rate shall be for each unit of Wash basin fixed.

1.03 Providing and fixing white vitreous china battery based infrared sensor operated urinal of approx. size 610 x 390 x 370 mm having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer in charge

1.0 MATERIAL

1.1 Urinal basin shall be flat back or angle 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.

1.2 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.

1.3 The flushing arrangement to urinals for single or in range shall be of CP brass with CP brass spreader of 15 mm diameter conforming to IS: 407.

1.4 Urinals shall be flushed by means of flushing cistern, exposed or concealed type as specified in schedule of quantities. Flushing cistern for urinals shall be automatic valve less type. Each flushing cistern shall have a copper siphon and inlet noose cock to control the flow and shall conform to IS 774 with necessary union& couplings for connection with inlet, outlet & overflow pipes.

1.5 Recommended capacity of flushing cistern & size of flush pipe shall be as below:

Nos. of urinals in range	Capacity of flush tank	Size of C.P. brass Flush pipe	
		Main	Distribution
One	5 liters		15 mm
Two	10 liters	20 mm	15 mm
Three	10 liters	25 mm	15 mm
Four	15 liters	25 mm	15 mm

1.6 Alternatively, urinals shall be flushed with flush valves, exposed or concealed manual type or by infrared sensor operated faucet with complete kit of plumbing, infra-red photo cells, solenoid valve and flush plate. The automatic flush sensor plate shall be flush and press fitted and shall be of high quality mirror polish finish. Each urinal shall be provided with one flush valve unit.

1.7 Urinals shall be provided with 32 mm P trap or bottle trap further connected to waste pipe.

1.8 Each Urinal outlet shall be provided with Brass dome shaped removable grating.

1.9 Where a floor channel is provided, tread plates shall be fitted to drain into channel. Channel shall be of fire clay, white inside & top edges, 100 mm diameter to dispose waste from urinals to the trap.

1.10 Urinal Flush pipes shall be GI / rigid PVC pipes.

1.11 Urinal partitions shall be white glazed vitreous china or 25mm thick marble of size specified in the schedule of quantities or directed by Architect.

2.0 FIXING

2.1 Bowl type Urinal shall be fixed to wall 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 recommended by manufacturer or directed by the Engineer-in-charge.

2.2 Flushing cistern shall be fixed to wall with R.S. or C.I. brackets. The brackets shall be painted with two coats of white enamel paint. Cistern may be concealed in pipe shafts or false ceilings if required as directed by Architect.

2.3 The cistern shall be connected with Urinal by means of standard GI/ rigid PVC flush pipe with CP brass wall clips & unions in concealed/ exposed manner. The joint between Urinal, flush & waste pipe shall be made of putty or white lead mixed with chopped hemp. Flush pipe can also be concealed as directed by Architect/ Engineer in charge.

2.4 The urinal shall be connected to waste pipe through P trap/ bottle trap which shall discharge Urinal waste to the floor channel or floor trap.

2.5 Urinal partitions shall be fixed at proper heights with CP brass bolts, anchor fasteners and MS clips as recommended by the manufacturer and directed by the Architect/ Consultants.

3.0 RATES

3.1 Glazed Urinals (single or in range) and CP brass pipe flushing pipe, spreader.

3.2 Flushing Cistern/ Manual or Sensor operated Flush Valves with brackets & hardware (if called in BOQ).

3.3 Waste coupling & P/Bottle trap.

3.4 Jointing & fixing materials.

3.5 CI brackets, Screws, Hardware.

3.6 Urinal Partitions with fixing accessories.

3.7 Cutting hole wherever required and making all damage good to original condition after completion of work.

3.8 Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
3.9 Testing the entire system and rectification of defects if any.
3.10 All necessary materials, labor and use of tools.

4.0 MODE OF MEASUREMENT

4.1 The measurement shall be for each unit of urinal set (single or range) fixed.

5.0 MODE OF PAYMENT

5.1 The contract rate shall be for each unit of urinal set (single or range) fixed.

1.04 Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required
Kitchen sink with drain board
510x1040 mm bowl depth 200 mm

SCOPE (Item Description)

The item pertains for providing white or colored glazed fireclay/ glazed vitreous chinaware/ stainless steel Kitchen Sink of type, size and color as specified in the schedule or as directed by Architect including all accessories & fixing, testing & commissioning.

MATERIAL

SS Sinks shall be provided with or without SS drain board. The sink shall be manufactured from stainless steel conforming to IS: 13983. Stainless steel sink shall be of one piece construction molded out of 19 SWG (1mm) stainless steel sheet of grade AISI 304 (18/8) with stainless steel choke – stop strainer (waste coupling) check nuts conforming to IS: 13983.

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.

Sink shall be single tap or two tap holes.

Each sink shall be provided with 40mm diameter C.P. waste with chain and plug & CP bottle/ P trap.

Sinks shall be supplied with mixing fittings or C.P. swivel taps, Long body taps as specified in the schedule of quantities.

FIXING

Each sink shall be provided with R.S. or C.I. brackets and clips and securely fixed. Counter top sinks shall be fixed with suitable painted angle iron clips or brackets as recommended by the

manufacturer. The MS Angle shall be provided with Two coats of red oxide primer and two coats of synthetic enamel paint of make, brand and colour as approved by the Architect/ Consultants. Or sink shall be placed inside the platform.

Sink shall be fitted with single/ double drain board such that top of the drain board shall be sloped towards sink. Drain boards shall be supported on brackets of mild steel screwed to wall at required heights.

Gap between platform/ wall & sink shall be finished with white matching cement.

RATES

Sink with or without drain board.
Brackets, Accessories & Hardware.
CP Waste Coupling, Bottle/ P trap, flexible pipe.
Angle cock, Taps, Mixer (if called in BOQ).
Jointing & fixing material.
Cutting hole/wall wherever required and making all damage good to original condition after completion of work.
Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of Sink fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of Sink fixed.

1.05 Providing and fixing Grid Drain (Without Overflow and with Full thread) (Waste Coupling) in Polished Chrome of approved make and conforming to Manufacturers Standards.
Waste Coupling: As per BOQ

1.0 GENERAL

The item pertains to provide chromium plated brass waste coupling including fixing.

2.0 MATERIAL

Waste Coupling shall confirm to IS 3311/ IS 2963.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.

3.0 INSTALLATION

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 the linseed oil or Teflon tape shall be taken over the threaded ends to obtain complete water tightness. Leaky joint shall be remade to make it leak proof.

4.0 THE RATE INCLUDES FOR

1. Waster coupling with necessary specials.
2. All necessary labor, material and the use of tools.

5.0 MODE OF MEASUREMENT

The measurement shall be for each unit of waste coupling fixed.

6.0 RATE

The contract rate shall be for each unit of waste coupling fixed.

1.06 Providing, fixing, testing and commissioning of C.P Brass Bottle Trap for Kitchen/Pantry Sink including making all necessary connection etc. and shall be nominal size of 40/50 mm. All complete as per directions of the Engineer In Charge.

1.0 GENERAL

The item pertains to provide chromium plated brass bottle trap including fixing.

2.0 MATERIAL

Bottle trap shall be of C.P 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 be 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.

3.0 INSTALLATION

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 linseed oil shall be taken over the threaded ends to obtain complete water tightness. Leaky joint shall remake to make it leak proof.

4.0 THE RATE INCLUDES FOR

1. Bottle trap with necessary specials.
2. All necessary labor, material and the use of tools.

5.0 MODE OF MEASUREMENT

The measurement shall be for each unit of bottle trap fixed.

6.0 RATE

The contract rate shall be for each unit of bottle trap fixed.

1.07 Providing, fixing, testing and commissioning of 15 mm dia. CP brass Bib cock (flow rate of 5 lpm) with wall flange and ceramic disc cartridge complete, making all necessary connections etc. All complete as per directions of the Engineer in charge.

1.0 MATERIAL

1.1 It shall be 15 mm. dia. brass screw down type with chromium plating, and shall conform to I.S. 781-1977. The taps shall be quarter or full threaded. The bib cock shall be best Indian make and quality as specified in item and approved by Architect/ Engineer In Charge.

1.2 A bib cock (stop tab) is a draw off tap with a horizontal inlet and free outlet and stop cock (stop tap) is a valve with a suitable means of connections for insertion in a pipeline for controlling or stopping the flow. They shall be of specified size and shall be of screw down type. The closing device should work by means of shuts against water pressure on a non-metallic washer, which shuts against water pressure on a seating at right angles to the exit of the threaded spindle, which operates it. The handle shall be either crutch or butterfly type securely seated pattern. The cocks (taps) shall open in anti-clockwise direction.

1.3 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.

1.4 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 threaded
MM	KG	KG	KG	KG
8.0	0.250	0.220	0.250	0.235
10.0	0.330	0.330	0.350	0.325
15.0	0.400	0.330	0.400	0.365
20.0	0.750	0.675	0.750	0.710
25.0	1.250	1.180	1.300	1.250
32.0	-	1.680	1.800	1.750
40.0	-	2.090	2.250	2.170
50.0	-	3.700	3.850	3.750

2.0 FIXING

2.1 The body of stop cock of 15mm diameter with adjustable flange shall be as specified above shall be fixed on water supply line keeping the arrow in the direction of flow as per drawing or as directed.

2.2 Transition male/ female adapter with shall be used on either side for PVC pipes.

2.3 The threaded portion shall be smeared with white or red lead and around with a few turns of fine spun yarn/ Teflon tape round the screwed end of the cock.

2.4 On completion the of tiling work ,the outer part of stop cock shall be fixed to the brass body

2.5 Every tap complete with its component shall with stand an internally applied hydraulic pressure of 2 Mpa (20 kg/sq.cm) maintained for a period of 2 minutes during the period it shall neither leak nor sweat. Leaky joint shall be remade to make it leak proof without any extra cost from contractor.

3.0 RATES

3.1 Bib Tap/ Angle Valve/ Stop cock as specified in Schedule of Quantities.

3.2 Wall flanges & Hardware.

3.3 Jointing & fixing material.

3.4 Cutting/ drilling hole– cutout in floor/ wall wherever required and making all damage good to original condition after completion of work.

3.5 Painting all the metallic parts with two coats of flat oil paint over a coat of primer.

3.6 Testing the entire system and rectification of defects if any.

3.7 All necessary materials, labor and use of tools.

4.0 MODE OF MEASUREMENT

4.1 The measurement shall be for each unit of Bib tap/Stop Cock/Angle Valve fixed.

5.0 MODE OF PAYMENT

5.1 The contract rate shall be for each unit of Bib tap/Stop Cock/Angle Valve fixed.

1.08 Providing, fixing, testing and commissioning of S.S. Double coat hook of approved make, fixed to PVC cleats with C.P. brass screws etc.all necessary accessories complete as per directions of the Engineer in charge.

The item pertains to provide SS/ chromium plated brass coat and hat hook including fixing.

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 ways Patti type of 125 mm x 30 mm x 6mm size. CP coating shall not be less than service grade No.2 of IS 4827.

FIXING

The Coat and hat hook shall be fixed to proper line & level as indicated in drawing with CP brass screws.

RATE

Coat and hat hook with CP screws etc.
All necessary labor, material and the use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of coat and hat book fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of coat and hook fixed.

1.09 Providing and fixing CP toilet paper holder with all necessary accessories complete as per directions of the Engineer in charge.

The item includes providing white or color glazed vitreous chinaware or chrome plated toilet roll holder of size as mentioned in the schedule including fixing.

MATERIAL

The toilet paper roll holder shall be of SS/ 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.

FIXING

Toilet paper roll holder shall be fixed in position with C.P brass cover.

Vitreous china toilet paper roll holder shall fix 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.

Chrome plated Brass toilet paper roll holder can be surface mounted by means of CP/ SS screws and rawl plug embedded in the wall.

RATE

Toilet paper roll holder.
Accessories & Hardware.
Cutting the pocket if they are not left in case of recessed fixing & drilling hole in wall in case of surface mounting.
Jointing & fixing material.
All necessary labor, material and the use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of toilet paper roll holder fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of toilet paper roll holder fixed.

1.10 Providing and Fixing Health Faucet with metal hose and Holder in Polished Chrome of approved quality and conforming to Manufacturers Standards.
Health Faucet: As per BOQ

1.0 MATERIAL

1.1 The health faucet shall be brass chromium plated or plastic or as specified in schedule of quantities. The chromium plating shall be of grade 'B' type conforming to I.S. 1068-2958.
1.2 Health faucet shall be provided with 1 mtr long flexible PVC tube and CP brass wall hook etc.

2.0 FIXING

2.1 The health faucet Hook & health faucet shall be fixed in position as per drawings or as directed by Architect/ EIC.
2.2 The height shall be approx 45cm from floor level if not mentioned in the drawing.
2.3 The one end of 1.0 meter long pipe shall be connected to faucet & other end to the angle cock.

3.0 RATE

3.1 Health Faucet & flexible PVC hose/ tube.
3.2 Accessories, Hardware, mounting hook.
3.3 Jointing & fixing material.
3.4 Cutting/ drilling hole– cutout in wall wherever required and making all damage good to original condition after completion of work.
3.5 Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
3.6 Testing the entire system and rectification of defects if any.
3.7 All necessary materials, labor and use of tools.

4.0 MODE OF MEASUREMENT

4.1 The measurement shall be for each unit of Health Faucet fixed.

5.0 MODE OF PAYMENT

5.1 The contract rate shall be for each unit of Health Faucet fixed.

1.11 Pillar Cock: Providing and fixing C.P. brass pillar cock for basin points of approved quality conforming to Manufacturers standards of 15mm nominal bore.
Pillar Cock: As per BOQ

1.0 GENERAL

1.1 The item pertains to provide chromium plated brass pillar tap of type, lever (spatula) operated or Pressmatic type as specified including fixing, testing & commissioning.

2.0 MATERIAL

3.0

3.1 The pillar tap shall be 15 mm nominal size or as specified in the schedule.

3.2 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.

3.3 Casting of Pillar tap shall be sound and free from laps, blow hole and pitting.

3.4 External and internal surface shall be clean, smooth and free from sand and be neatly dressed.

3.5 All the parts fitted to pillar tap shall be axial, parallel and cylindrical with surfaces smoothly finished.

3.6 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.

3.7 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.

4.0 FIXING

4.1 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.

4.2 Jointing shall be done with white zinc, spun yarn/Teflon tape etc. A few turns of fine hemp yarn dipped in linseed oil/ Teflon tape shall be taken over the threaded ends to obtain complete water tightness.

4.3 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.

5.0 RATE

5.1 Pillar Tap.
5.2 Wall flanges, Hardware & Accessories.
5.3 Jointing & Fixing material.
5.4 Cutting/ drilling hole– cutout in floor/ wall wherever required and making all damage good to original condition after completion of work.
5.5 Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
5.6 Testing the system and rectification of defects if any.
5.7 All necessary materials, labor and use of tools.

6.0 MODE OF MEASUREMENT

6.1 The measurement shall be for each unit of pillar tap fixed.

7.0 MODE OF PAYMENT

7.1 The contract rate shall be for each unit of pillar tap fixed.

1.13 Angle Valves: Providing and fixing C.P. brass angle valve for basin mixer, health faucet, and geyser points of approved quality conforming to IS:8931 of 15mm nominal bore.
Angle Valve: As per BOQ

Relevant Specifications shall be followed as per item number 1.07 except that CP Brass Angle Valve shall be installed as per drawing. Rate shall be for per number of Angle Valve Installed.

1.14 Providing, fixing, testing and commissioning of single S.S soap dish, including chasing in the wall, fixing the soap dish and finishing in the wall and at levels as directed by the Engineer in charge.

The item includes providing white or color glazed chinaware type or CP brass or Glass soap dish of size as mentioned in the schedule including fixing.

MATERIAL

Soap Dish shall be of SS/ CP 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.

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 in recessed manner 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.

Chrome plated Brass soap dish can be surface mounted by means of CP/ SS screws.

RATE

Soap dish.
Accessories & Hardware.
Cutting the pocket if they are not left in case of recessed fixing & drilling hole in wall in case of surface mounting.
Jointing & fixing material.

All necessary labor, material and the use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of soap dish fixed.

MODE OF PAYMENT

Contract rate shall be for each unit of soap dish fixed.

1.15 Providing, fixing, testing and commissioning of C.P. brass Single lever shower mixer / 4-way Divertor with Hot and cold inlets and outlets for spout and overhead shower with cast brass concealed part for the divertor unit of approved quality with CP wall flanges conforming to Manufacturers standards. Work to be completed as approved and directed by the Engineer in charge.

The item pertains for providing chromium plated shower mixer as specified in the schedule or as directed by Architect including all accessories & fixing, testing & commissioning.

MATERIAL :

Shower mixer shall be chromium plated & to be supplied with concealed/ exposed stop cock/ single lever diverter, single/double taps, bath spout with required pipe bends, pipe, wall flange, accessories & hardware complete.

Shower mixer can be 2-in-1wall mixer with provision for overhead shower & bath spout or can be 3-in-1 wall mixer with provision for Hand Shower, Overhead Shower & Bath spout Complete with 115mm Long Bend Pipe, Connecting Legs & Wall Flange (without Hand & Overhead Shower) of approved quality all as specified in the wall Schedule of Quantities.

Mixer shall be thermostatic type if specified in BOQ.

Shower shall have flow rate of 10 LPM unless otherwise specified.

FIXING

The fixing shall concealed/ exposed be as shown in the drawing and as per the manufacturers specifications.

Connection of shower taps/ cocks/ diverter with water supply main shall be leak proof joint.

Wall flanges shall be kept clear off the finished wall. Wall flanges embedded in the finishing shall not be accepted.

RATES

Shower Mixer.
Brackets, Accessories, Hardware, wall flanges.
Exposed / Concealed stop cocks / single lever diverter, bib taps & bath spout (as specified in schedule of quantities).
Jointing & fixing material.
Cutting hole– cutout in floor/ ceiling/ wall wherever required and making all damage good to original condition after completion of work.
Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of shower mixer fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of shower mixer fixed.

1.16 Providing, fixing, testing and commissioning of C.P. Brass Over Head Shower rose with C.P. brass Shower arm of approved make and quality, and as approved by the Engineer in charge.

The item pertains for providing chromium plated shower set of shape & size as specified in the schedule or as directed by Architect including all accessories & fixing, testing & commissioning.

MATERIAL

Overhead Shower of Shape & size as specified in schedule of quantities or directed by Architect.

It shall be Single/ Multi Flow with Air Effect (ABS Body & Face Plate Chrome Plated).

Shower head shall be provided with self cleaning system.

Shower set shall also be provided with C.P. Shower arm with wall flange and shower head of approved quality as specified in the bill of quantities. Arm shall be fixed or swivel type to adjust the angle.

Shower flow shall be 10 LPM unless otherwise specified.

Accessories shall conform to IS 1239 Part II.

FIXING

The fixing shall be as shown in the drawing and as per the manufacturers specifications.

Shower arm shall be either concealed or exposed according to drawing.

Connection of shower set with water supply main shall be leak proof joint.

Wall flanges shall be kept clear off the finished wall. Wall flanges embedded in the finishing shall not be accepted

RATES

Shower with arm.
Brackets, Accessories & Hardware.
Jointing & fixing material.
Cutting hole– cutout in ceiling/ wall wherever required and making all damage good to original condition after completion of work.
Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of Overhead shower fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of Overhead shower fixed.

1.17 Providing, fixing, testing and commissioning of S.S. Towel rail or Towel Ring of approved make and quality, and as approved by the Engineer, fixed with cleats with CP brass Screws and wall flanges etc. all complete as per directions of the Engineer in charge.

SCOPE (Item Description)

The item includes providing Towel rod/ towel ring of size as mentioned in the schedule including fixing.

MATERIAL

Towel rail shall be of SS or 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 diameter unless otherwise specified in the schedule.

Towel ring of SS/ 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.

FIXING

The towel rod/ ring shall be fixed to proper line and level as indicated in drawing with CP brass screws, wooden raw plug, drilling hole etc. and making good the wall to original condition after fixing the towel rod.

RATE

Towel rod rail/ ring CP brackets & screws etc.
Fixing material.
All necessary labor, material and the use tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of towel rod fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of towel rod fixed

1.18 Providing, fixing, testing and commissioning of Chrome plated brass Liquid Soap Dispenser of capacity as indicated below of approved make and quality, and as approved by the Engineer in charge, including all necessary materials required for fixing. All complete as per directions of the Engineer in charge. Automatic soap dispenser with minimum 0.8 litre capacity for all common toilet.

SCOPE (Item Description)

The item pertains to provide Liquid Soap Container with dispenser including fixing, testing & commissioning.

MATERIAL & FIXING

Liquid soap container body & shank shall be high impact resistant material. Piston & spout shall be of stainless steel or ABS or any other material with polyethylene container having capacity 1 liter, if not specified. Or it shall be made of clear glass or chinaware type construction.

It shall be wall mounted or counter mounted suitable for dispensing liquid soap, lotion, detergent, etc.

Cover shall lock to body with concealed locking arrangement, only opened key be provided.

RATES

Liquid soap container with dispenser.
Brackets, Accessories & Hardware.
Jointing & fixing material.
Drilling hole in wall wherever required and making all damage good to original condition after completion of work.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of Liquid Soap Container fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of Liquid Soap Container fixed.

1.19 Supply, installation, testing and commissioning of wall hanging / floor mounted Double level drinking water fountain with One Filling Station, one upper level, other at lower level fountain, not less than W 895MM X H 960MM X D475MM. Shall include antimicrobial copper push pads and recessed frame for mounting in the wall or equivalent accessories. Basin shall be designed to eliminate splashing and standing water. Water saver ss bubbler reduce waste water by 50% and shall operate between 20 and 100 PSI with UV and sediment filtration. Cabinet finish shall be brushed stainless steel. GRIHA certified with all necessary accessories, as per specification/drawings and as directed by Engineer In Charge.

SCOPE (Item Description)

The item pertains to provide drinking water fountain including fixing, testing & commissioning.

MATERIAL & FIXING

Material shall be Vitreous China or Stainless steel or any other material as specified in schedule of quantities.

Drinking fountain shall be with anti squirt bubble less, self closing valve type with automatic volume regulator.

It shall be installed with anti splash back & integral strainer with 32/ 40 mm cast brass waste trap.

It shall be floor mounted/ wall mounted/ counter mounted or as required by architect.

Gap between wall/ floor/ counter & fountain shall be finished with white matching cement.

RATES

Drinking Fountain.
Brackets, Accessories & Hardware.
Waste Trap.
Jointing & fixing material.
Cutting/ drilling hole/ wall wherever required and making all damage good to original condition after completion of work.
Painting all the metallic parts with two coats of flat oil paint over a coat of primer.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of Drinking Fountain fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of Drinking Fountain fixed.

1.20 Providing, fixing, testing and commissioning of solid state, no touch operting, fully hygienic hand drier of approved shade with single blower, with time delay, summer & winter control, music while drying, volume ON/OFF controls including providing necessary brackets, cable from drier to Plug, Plug top key and lock etc, complete as required with all necessary accessories, as per specification/drawings and as directed by Engineer In Charge.

The item pertains to provide Hand Drier including fixing, testing & commissioning.

MATERIAL & FIXING

The hand drier shall be no touch operating type with solid state time delay to allow user to keep hand in any position.

The hand drier shall be fully hygienic, rated for continuous repeat use (CRU).

The rating of hand drier shall be such that time required to dry a pair of hands up to wrists is approximately 30 seconds.

The hand drier shall be of wall mounting type suitable for 230V, single phase, 50 Hz, AC power supply.

RATES

Hand Drier.
Brackets, Accessories & Hardware.
Jointing & fixing material.
Making all damage good to original condition after completion of installation work.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of Hand Drier fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of Hand Drier fixed.

Section 2.00 Water Supply

2.01 Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge.

(CPVC) SDR 11 pipes

1.1 This specification covers the requirements for manufacture, supplying, lowering, laying, jointing, testing and commissioning of CPVC solvent welded pipe with fittings for the conveyance & distribution system.

2.0 MATERIAL

2.1 The pipes and fittings chemically known as Chlorinated Poly Vinyl Chloride [CPVC] shall be produced in Copper Tube Size [CTS] from ½" to 2" with two different standard dimensional ratios – SDR 11 and 13.5.

2.2 The fittings shall be produced as per SDR 11.

2.3 All the CPVC pipes and fittings in SDR 11 and SDR 13.5 shall be made from the identical CPVC compound having the same physical properties.

2.4 Pipes and fitting shall be produced as per SDR 11 & shall meet the requirement of ASTM D 2846 where as the pipes produced with SDR 13.5 shall meet the requirement derived from ASTM F 442, specific to CPVC in Iron Pipe Size[IPS] dimension, which also shall be applied to CPVC pipes in Copper Tube Size[CTS] dimension.

3.0 CUTTING AND JOINTING AND LAYING

3.1 CUTTING:

3.2 In order to make a proper and neat joint, the pipe length shall be measured accurately and make a small mark. Ensure that the pipe and fittings are size compatible. It shall be easily cut with a wheel type plastic pipe cutter or hacksaw blade. Cutting tubing as squarely as possible shall provide optimal bonding area within a joint.

3.3 DEBURRING/ BEVELING:

3.4 Burrs and filings shall prevent proper contact between tube and fitting during assembly and should be removed from the outside and inside of the pipe. A pocket knife or file shall be used for this purpose. A slight bevel on the end of the tubing shall ease the entry of the tubing into the fitting socket.

3.5 FITTING PREPARATION:

3.6 Using a clean, dry rag, wipe dirt and moisture from the fitting sockets and tubing end. The tubing should make contact with the socket wall 1/3 to 2/3 of the way into the fitting socket.

3.7 SOLVENT CEMENTS APPLICATION:

3.8 Use only CPVC cement or an all – purpose cement conforming to ASTM -493 or joint failure may

result. When making a joint, apply a heavy, even coat of cement to the pipe end. Use the same applicator without additional cement to apply a thin coat inside the fitting socket. Too much cement can cause clogged water ways.

3.9 ASSEMLY:

3.10 Immediately insert the tubing into the fitting socket, rotate the tube ¼ to ½ turn while inserting. This motion will ensure and even distribution of cement within the joint. Properly align the fittings. Hold the assembly for approximately 10 seconds, allowing the joint to set-up.

3.11 SET AND CURE TIMES:

3.12 Solvent cement set and cure times are a function of pipe size, temperature and relative humidity. Curing time is shorter for drier environments, smaller sizes and higher temperatures. It requires 10 to 20 minutes for perfect joint.

3.13 CEMENTING:

3.14 Verify the cement is the same as the pipes and fittings being used.

3.15 Check the temperature where the cementing will take place.

3.16 Cement takes longer time to set up in cold weather. Be sure to allow extra time for curing. Do not try to speed up the cure by artificial means – this could cause porosity and blisters in the cement film.

3.17 Solvents evaporate faster in warm weather. Work quickly to avoid the cement setting up before the joint is assembled. Keep the cement as cool as possible. Try to stay out of direct sunlight.

3.18 Keep the lid on cements, cleaner and primers when not in use. Evaporation of the solvent will affect the cement.

3.19 Stir or shake cement before using.

3.20 Use ¾" dauber on small diameter pipes, 1 ½" dauber up through 3" pipe, and a natural bristle brush, swab or roller ½ the pipe diameter on pipes 4" and up.

3.21 Do not mix cleaner or primer with cement.

3.22 Do not use thickened or lumpy cement. It should be like the consistency of syrup or honey.

3.23 Do not handle joints immediately after assembly.

3.24 Do not allow dauber to dry out.

3.25 Maximum temperature allowable for CPVC pipe is 180o F.

3.26 All colored cements, primers and cleaners will have a permanent stain. There is no known cleaning agent.

3.27 Use according to the step outline in ASTM D – 2846, joining of pipe and fittings.

4.0 INSULATION (UNLESS OTHERWISE SPECIFIED)

4.1 All the Hot Water supply & Hot Water return pipe shall be insulated in the manner specified hereinafter.

4.2 Insulating material shall be rigid performed sections of mineral/ rock wool with a “K” value of not more than 0.036 W/MK at 100 Deg. C mean temperature and of density 140 Kg/Cu.m or it shall be of Nitrile rubber.

4.3 No insulation shall be applied until the pipe is satisfactorily pressure tested.

4.4 Pipes shall be insulated with rigid performed pipe sections of the following thickness:

SR	PIPE DIAMETER (MM)	THICKNESS
1	80-150	50
2	40-65	9
3	15-32	6

4.5 Pipe insulation shall be applied as follows or as Specified in BOQ.

4.6 Pipe shall be thoroughly cleaned with wire brush and rendered free from all rust and grease and applied with two coats of antirust paint.

4.7 Pipes in Shaft:

4.8 Fix rigid performed sections of insulation with adhesive between all points (transverse and circumferential).

4.9 The insulation shall be tied with GI chicken wire mesh.

4.10 The insulation shall be provided with 24 gauge aluminium cladding screwed at the joints with cadmium coated self tapping screws. Joints shall be overlapped minimum 12mm wide.

4.11 Pipes exposed to weather:

4.12 Fix rigid performed sections of insulation with adhesive between all points (transverse and circumferential).

4.13 The insulation shall be tied with GI chicken wire mesh.

4.14 Provide polythene based hessian (500 gauges) overlapping 100mm on all joints (transverse and circumferential) and stitched at the joints.

4.15 The hessian shall be covered with 15mm x 20mm hexagonal chicken wire mesh.

4.16 Over the wire mesh the surface shall be covered with two layers of tar felt grade-II and type-II with bitumen between layer overlapping 100mm on all joints (transverse & circumferential).

4.17 Over the second layer of tar felt final coat of hot bitumen not less than 6mm thick shall be applied.

4.18 Over the final layer of tar felt and hot bitumen coat aluminium cladding shall be provided with 24 gauge aluminium shut screwed at the joints with cadmium coated self-tapings screws. Joints shall be overlapped minimum 25mm wide.

5.0 TESTING

5.1 After laying and jointing, the pipes and fittings shall be inspected under working condition of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost. Use of any compound or stop leak compound will not permit.

5.2 The pipes and fittings after they are laid shall be tested to hydraulic pressure of 1.5 times the working pressure or 7.5 Kg/Sq.cm whichever is more. The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw of 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 two hours. The pipes and fittings shall be tested in sections as the work of laying proceeds, having the joints exposed for inspection during the testing.

6.0 RATES

6.1 CPVC pipes and fittings of specified diameter & pressure class.
6.2 Laying and cutting the pipe wherever necessary and wastage.
6.3 Over ground installation with supports/ clamps, accessories required, Concealed installation with required civil work.
6.4 Pipe & Fitting with insulation for hot water application if specified in schedule of quantities.
6.5 Making the solution joint, painting the pipe line if mentioned in schedule of quantities.
6.6 Making all damage good to original condition after completion of installation work.
6.7 Testing the entire system and rectification of defects if any.
6.8 All necessary materials, labor and use of tools.

7.0 MODE OF MEASUREMENT

7.1 The measurement shall be for unit running meter length of pipe line laid of fixed. The measurement shall be taken along the center line of pipe. No measurement shall be recorded separately for fittings, making joint, supports, clamps, civil work, painting if mentioned in schedule of quantities. It shall also include insulation for hot water application if mentioned in schedule of quantities.

8.0 MODE OF PAYMENT

8.1 Mode of payment shall be Unit length of pipe line laid or fixed. No extra payment shall be made for fittings, making joint, supports, clamps, civil work, painting if mentioned in schedule of quantities. It shall also include insulation for hot water application if mentioned in schedule of quantities.

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2.02 Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :

The item includes provision valves of type, size & pressure class as mentioned in the schedule of quantities including fixing, testing & commissioning.

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 or copper alloy as the case may be. The weight of the full way gate valve shall be as per the table given below with a tolerance of 5 percent.

Diameter in mm	Flanged arch (Kg)	Screwed arch (Kg)
15	1.021	0.567
20	1.503	0.680
25	2.495	1.077
32	3.232	1.559

Diameter in mm	Flanged arch (Kg)	Screwed arch (Kg)
40	4.082	2.268
50	6.691	3.232
65	10.149	6.804
80	13.381	8.845

Check/NRV shall be either brass or Gun metal body with single door design
The valves shall have either screwed ends or flanged ends

BALL VALVES

All ball valves shall be heavy duty of approved make. Valves shall have suitable for pressure of PN 1.6.
Ball valves up to 80 mm shall have forged brass body, SS spindle & Teflon seat rings.
Ball valve shall conform to IS: 9890 or BS: 1868

SLUICE VALVES

Sluice valves shall conform to IS 14846 with PN 1.6 rating as specified. Valve body shall be cast iron & spindle, valve seat & wedge nut shall be of gun metal. The valve shall be generally non rising spindle design. The valve shall be provided with C.I. hand wheel for exposed installation & cap top for underground installation.

Valve shall be generally flanged ends & fitted by means of non corrosive bolt, nuts & asbestos fiber gaskets.

BUTTERFLY VALVE

All butterfly valves shall be heavy duty cast iron of approved make. The valves shall be suitable for PN 1.6 rating as specified & shall conform to IS: 13095 or BS: 5155. Valve shall be either wafer type design or flanged ends. Valve body shall be of cast iron & disc shall be of C.I. / C.S with EPDM disc seal & SS spindle. Valve shall have manual handle/ lever operation.

NON-RETURN VALVES

Non return valve shall be either lift single/ multi door type or spring operated check valves.
For sizing more than 50 mm, generally NRV shall be of Cast Iron body, CI / CS door.
Single door Non return valve shall conform to IS 5312 up to 600 mm. Size above 600 mm shall have multi door design. Spring operated shall conform to API 594/598 standard having spring for non slam action.

Material of Valves for hot water application shall withstand the temperature up to 80 deg. C.

Generally all internal valves (within the building) shall be of Gun Metal unless otherwise specified. All external installation on pipe line, plant rooms, etc. shall be of cast iron unless otherwise

specified.

All valves up to 50 mm shall have screwed ends while all valves beyond 50 mm size shall have flanged ends. Flange dimensions shall conform to IS: 1538 Table IV & VI or IS: 6392 PN 1.6

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, flanges, hardware, gaskets, tail piece, etc. During installation, flow direction on the valve shall be checked.

Valves shall be preferably installed in horizontal position, except butterfly valves which can be fixed in the vertical position.

Screwed valves after few turns shall be applied with Teflon tape over the threaded ends to obtain complete water tightness. Flanged joint shall be fixed with non corrosive bolts & nuts with suitable thickness asbestos fiber gasket conforming to IS 638 for water tightness.

TESTING

The valves shall be body & seat tested at manufacturer's works as per the relevant standard & duly stamped. Test certificate shall be submitted for material & hydraulic testing.

After fixing in the pipelines, the system shall be hydraulically tested for 1.5 times working pressure or 10 kg/cm2 whichever is higher for minimum 4 hrs without any pressure drop. In case of leakage, contractor shall rectify/replace valves at his own cost

Valves shall also be tested for its hand wheel/ lever function by frequent on-off operation.

RATES

Valve of required type, size & pressure rating.
Fixing & jointing material.
Painting.
Making all damage good to original condition after completion of installation work.
Testing.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit valve of specified diameter fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of valve of specified diameter fixed. No extra payment shall be made for G.I. fittings used in fixing of the valve.

2.03 Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :

The item includes construction of brick masonry valve chamber of size as specified in this schedule including providing M.S./ C.I. frame and cover or R.C.C pre-cast cover with or without surface box.

MATERIAL

Brick work, plastering, concreting etc. shall be as per general specification under section II. Precast RCC cover slab, surface box, C.I/ M.S frame and cover etc. Shall be size and weight as specified in the schedule.

CONSTRUCTION

Foundation concrete of mix 1:2:4 shall be of 150 mm thick with 150 mm offset all round or as specified in the schedule.

Brick masonry in cement mortar 1:5 or as specified.

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.

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.

Valve chambers with depths greater than 1 meter shall be provided with 20 mm square or 25 mm round rods the steps shall be fixed in brick masonry wall with 1:2:4 cement concrete with 75mm 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. Cast iron step shall be painted with two coats of approved black bitumastic anti corrosive paint over a coat of primer. Or foot rests shall be PVC coated.

Valve chambers shall be provided with Cast Iron / pre cast RCC cover & frames & embedded in reinforced cement concrete slab. Weight of cover & frame & thickness of the slab shall be as specified in schedule of quantities.

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.

RATES

Concreting in foundation, constructing brick masonry and plastering over the brick work and finishing smooth inside surfaces.
Surface box if called in schedule of quantities.
Cover & Frame (if called in schedule of quantities).
Foot rests (if called in schedule of quantities).
Making all damage good to original condition after completion of construction work.
Dewatering the pit if found necessary till completion of work.
All necessary labor, materials and use of tools.

MODE OF MEASUREMENT

The measurement shall be for one valve chamber of specified finished internal size and initial depth measured vertically from top of the frame and cover to the invert of chamber.

MODE OF PAYMENT

The contract rate shall be for unit circular manhole of specified internal size and depth

2.04 Providing & fixing on line turbine type flow meter / Water Meter with preamplifier & microprocessor based electronic flow meter mounted in plumbing plant room electrical control panel with the following features. Monitoring the total flow, Flow rate, high low arm batching and blending etc. Including electrical wiring from preamplifier to microprocessor based flow meter. Complete with all type of Plumbing & Electrical connections, accessories, wiring, conduits & supports complete with all respect. The signal from read out shall be 4-20 m.amps to be received on BAS.

The item includes provision of Water meter with or without end flanges, non-return valve of specified diameter as mentioned in the schedule with strainer, sockets, flange, union, nuts etc. including fixing and testing.

MATERIAL

Water Meter shall conform to IS: 779 (Domestic type) or IS: 2373 (Bulk type) as specified in Schedule of Quantities 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.

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.

Screwed Joint
A few turns of Teflon tape shall be taken over the threaded ends to obtain complete water tight joint.

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.

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.

RATES

Water meter with strainer non-return valve, sockets, union nut etc.
Making screwed or flanged joints with jointing material.
Making all damage good to original condition after completion of installation work.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of water meter of specified diameter fixed.

MODE OF PAYMENT

The contract rate shall be for each unit Water Meter of specified diameter fixed. No extra payment shall be made towards making flanged and other joints and G.I. fittings used in fixing of the water meter.

2.05 Providing, fixing,jointing, testing and commissioning of Heavy Duty Brass Float Valve consisiting of brass valve, brass stem and copper float ball suitable for the working pressure of the feeding line, including all necessary specials for connection to the GI pipes including hydraulic testing etc. complete as per specification/drawings and as directed by Engineer In Charge.

SCOPE

The item pertains to provide Ball float valve including fixing, testing & commissioning.

MATERIAL & FIXING

The valve shall be of copper or as specified in schedule of quantities.

Size of float valve shall be as specified in schedule of quantities.

Connecting rod to ball float shall be of brass & shall withstand high pressure encountered on it.

It shall be brazed or soldered to render it leak proof.

RATES

Ball float valve.
Making all damage good to original condition after completion of installation work.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of Ball float valve fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of Ball float valve fixed.

2.06 Providing, fixing, jointing, testing and commissioning of Pressure Reducing Valve Set for cold water supply comprising of 2 Nos Gun Metal ball valves on inlet & outlet & 01 no. Globe valve for by-pass, 01 No. Brass housing diaphragm operated Pressure Reducing Valve with flanged / screwed connection, with in-built SS 316 Filter with filter opening size 0.8 mm or lower, 1 Nos Pressure gauge on outlet, and 1 No. 15 mm dia safety valve. The complete system is tested to a pressure not less than 10 Kg/Sq.cm Including necessary pipe & fittings; i.e. flanges/ unions, nuts, bolts and washers complete as required. (installed on cold water make up line to Hot water mixing tank) with all necessary accessories, as per specification/drawings and as directed by Engineer In Charge.
Note: The PRV shall be installed in an accessible location.
Inlet Pressure: Max. 10 Kg/Sq.cm
Outlet Pressure: 2.5 Kg/Sq.cm

The item includes provision of pressure reducing valve of specified diameter with all accessories as mentioned in the schedule including fixing.

MATERIAL

Pressure reducing valve is a device with suitable means of connection for insertion in a vertical pipe line for controlling the water pressure.

Each pressure reducing valve (PRV) set/ assembly shall be installed with pressure reducing/regulating valve, isolating valves & pressure gauges on inlet & outlet, strainer at inlet & pressure relief valve on outlet as called in BOQ.

PRV shall be of brass housing, spring bonnet with adjustable opening having adjustable knob for pressure adjustment. Valve shall be vertical flow type, conforming to IS: 9739-1981.

Each PRV shall contain loading neoprene diaphragm & a full floating, self aligning, ignition resistant seat. Valve shall be of singe stage pressure reduction type.

Strainer provided at the inlet shall be of replaceable porous sintered metal type.

Each pressure relief valve shall be of the fully enclosed type and fitted with hand easing gear. Each pressure relief valve in a pressure reducing station shall have a flow capacity equal to that of the pressure reducing valve.

Pressure relief valves in locations other than reducing stations shall have flow capacities equal to that of the associated equipment.

FIXING

The valve shall be fixed in position on the pipe line as shown in the drawing or as directed. The screwed or flanged joint shall be made to obtain complete water tight joint.

The force of the diaphragm shall operate against the force of an adjustable spring. The inlet pressure shall have no influence in either the opening or closing the valve, hence, the outlet pressure shall remain constant at all times.

Adjustment of Pressure:
The knob fitted on top of the PRV shall be turned toward (-) or (+) sign to reduce/ increase the outlet pressure as desired range.

Inlet pressure	:	Max 16 bar
Outlet pressure	:	1.5 to 6 bar adjustable
Maximum pressure drop	:	1 bar

Valves shall be either screwed ends or flanged ends with all required jointing/ fixing accessories like tail piece, hardware, Teflon tape, gaskets, etc.

TESTING

The joints shall be tested to a hydraulic pressure of 1MPa (10 kg/cm2) or 1.5 times working pressure whichever is higher along with testing of pipe line for a minimum duration of 2 hrs.

RATES

Pressure reducing valve set/ assembly having pressure reducing valves of specified diameter, isolating valves & pressure gauges on inlet & outlet, strainer at inlet & pressure relief valve on outlet including fixing.
Fixing & jointing material.
Painting.
Making all damage good to original condition after completion of installation work.
Testing & commissioning.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each set of valve of specified diameter fixed.

MODE OF PAYMENT

The contract rate shall be for each set of valve of specified diameter fixed

2.07 Providing, fixing, jointing, testing and commissioning of Nitrile rubber closed cell (Thermo plastic elastomeric) insulation (insulation shall be as per class 'O' IMO fire performance) of the following diameter and thickness over Hot water pipes Potable,Non-Potable pipes (Terrace ring main) and fittings, of minimum 45 kg / M³ density and haivng thermal conductivity 0.037W/MK or better at 20°C mean temperature, class 'O' insulation applied by suitable adhesive complete as per manufacturers specifications (for internal and external Hot water supply) including 22 SWG GI sheet cladding over nitrile rubber insulation on hot water pipe work with necessary accessories as per specifications/drawings all complete as per directions of the Engineer In charge. Rate includes cost of all materials including fixing the insulation with the pipes with tapes or adhesives, labour charges for working at all levels. leads and heights. For Hot water/Potable Water /Non-Potable water.

This specification covers the requirements for manufacture, supplying, applying, jointing, testing and commissioning of pipe insulation with coating for hot water conveyance & distribution system

MATERIAL & INSTALLATION

Insulation material for Pipe insulation shall be Closed Cell Elastomeric Nitrile Rubber or closed cell cross linked polyethylene foam.

Thermal conductivity of elastomeric nitrile rubber shall not exceed 0.038 W/moK or 0.0313 Kcal/Mhr C° or 0.212 BTU/ (Hr-ft2-oF/inch) at an average temp. Of 30 C°. The product shall have temperature range of –40 C° to 105 C°.

Density of material shall not be less than 0.06 gm/cm3.

The insulation shall have fire performance such that it passes minimum CLASS 1 as per BS476 part 7 for surface spread of flame. Water vapor permeability shall not exceed 0.024 per inch (3 x 10-14 Kgs/ m.sec.Pa).

Thickness of the insulation shall be as specified for the individual application.

Each lot of insulation material delivered at site shall be accompanied with manufacturer test certificate for thermal conductivity values. Samples of insulation material from each lot delivered at site may be selected by Owner's site representative and gotten tested for thermal conductivity and density at Contractor's cost.

All joints shall be sealed properly with adhesive, which shall provide similar vapor barrier as the original insulating material.

All hot water piping shall be insulated in the manner specified herein. Before applying insulation, all pipes shall be brushed and cleaned. Thermal insulation shall be applied as follows or as specified in drawings or schedule of quantity.

Pipe size (mm)	Thickness
15 mm to 25 mm	9 mm
32 mm to 50 mm	13 mm
65 mm	19 mm
80 mm to 150 mm	50 mm

Insulation for pipes in wall chase and for pipes in shaft / plant room.
Insulating material in tube form shall be sleeved on the pipes. On existing piping, slit opened tube from insulating material shall be placed over the pipe and adhesive (as recommended by the manufacturer) shall be applied as suggested by the manufacturer. Adhesive must be allowed to tack dry and then press surface firmly together starting from butt end and working towards centre.
Wherever flat sheets shall be used it shall be cut out in correct dimension. All longitudinal and transverse joints shall be sealed as per manufacturer recommendations. The insulation shall be continuous over the entire run of piping, fittings and valves.
All valves, fittings, joints, strainers etc. in hot water piping shall be insulated to the same thickness as specified for the main run of piping and application shall be same as above. Valves bonnet, yokes and spindles shall be insulated in such a manner as not to cause damage to insulation when the valve is used or serviced.
All insulation work shall be carried out by skilled workmen specially trained in this kind of work. All insulated pipes shall be labeled (HWS/ HWR/ HWRR) and provided with 300 mm wide band of paint along circumference at every 1200 mm for colour coding. Direction of fluid shall also be marked. All painting shall be as per relevant BIS codes.

PROTECTIVE COATING OVER INSULATION

To provide mechanical strength and protection from damage all exposed pipe insulated with nitrile rubber as indicated in BOQ shall be covered with fiber glass fabric. The fiber glass fabric shall be

applied with one coat of fire proof epoxy or acrylic compound (resin & hardener). The coat shall be allowed to cure to non stick state. Subsequently second coat of compound shall be applied to give a tough and smooth finish to the insulated surface.

RATES

Insulation material with thickness as specified in schedule of quantities with required thermal conductivity & density.
Application of insulation with all jointing & fixing materials.
Making all damage good to original condition after completion of installation work.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MEASUREMENT & PAYMENT

Unless otherwise specified measurement & payment for pipe insulation for the project shall be on the basis of centre line measurements described herewith Pipe Insulation shall be measured & payment shall be made in units of length along the centre line of the installed pipe, strictly on the same basis as the piping measurements. The linear measurements shall be taken before the application of the insulation. It may be noted that for piping measurement, all valves, orifice plates and strainers shall not be separately measurable by their number and size. It is to be clearly understood that for the insulation measurements & payment, all these accessories including valves, orifice plates and strainers etc. shall be considered strictly by linear measurements along the centre line of pipes and no special rate shall be applicable for insulation of any accessories, fixtures or fittings whatsoever.

Section 3.00 Drainage

3.01 Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design:

SCOPE

The item includes provision of S.W. Gully trap with C.I. frame including construction of Gully Trap Chamber.

MATERIAL

The Gully Trap shall be of salt glazed stoneware with 150 mm nominal square inlet or as specified in the schedule with 100mm diameter outlet. Gully trap shall conform to IS: 651.

Gully trap shall be sound & free from visible defects such as fire cracks, hair cracks. It shall sound clear when struck with light hammer.

Gully trap shall be provided with CI grating of square size corresponding to the dimensions of inlet of gully trap.

The gully trap shall have a water tight Cast Iron cover & frame inside dimensions 300x300 mm & the cover weighing not less than 4.5 Kg & frame not less than 2.7 kg.

FIXING

Internal dimension of the Gully trap chamber shall be as specified in the schedule.

Gully trap shall be fixed on cement concrete foundation 65 mm square & not less than 10 cm thick.

The mix for the concrete will be 1:4:8. The jointing of gully outlet trap shall be to the branch drain shall be done similar to the jointing of S.W. pipes.

After fixing & testing gully & branch drain, a brick work in cement mortar 1:5 shall be built with a half brick masonry work round the gully tarp from the top of bed concrete up to ground level.

The space between the chamber & trap shall be filled in cement concrete 1:3:6. The upper portion of the chamber i.e. above the top level of the trap shall be plastered inside the cement mortar 1:3 finish with a floating coat of neat cement.

The corners & bottom of the chamber shall be rounded off so as to slope towards the grating.

CI cover with frame 300x300 mm inside dimensions shall be fixed on top of brick masonry with cement concrete of 1:2:4 & rendered smooth. It shall be painted with 2 coats of black bituminous

paint.

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.

RATES

Supplying of stoneware gully trap with C.I. frame and cover.
Concreting, brick work plastering, fixing frame and cover.
Dewatering if necessary till completion of work.
Painting & Making all damage good to original condition after completion of installation work.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for unit of Gully Trap chamber of specified internal size and depth constructed including stoneware Gully Trap and C.I. frame and cover fixed.

MODE OF PAYMENT

The contract rate shall be for unit of Gully Trap chamber constructed as a whole.

3.02 Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand (zone-III) : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design :

SCOPE

The item includes provision of brick masonry Manhole Chamber of internal size as specified in the schedule of quantities.

MATERIAL

Concreting, Brick work, plastering etc, shall be as per specification as given in general specification under section II.

CONSTRUCTION

Internal dimensions and initial depth shall be as specified in the schedule or as shown in the drawing. If not specified, size of manholes shall be constructed as follows.

Size of Manhole Type	900x800mm Rectangular	1200x900mm Rectangular	1400 diameter Circular
Maximum Depth	1000	2450	Any depth beyond 2450
Average thickness of RCC slab	150	150	---
Size of cover and frame (Internal diameter)	610x455	500 diameter	500 diameter
Weight of cover and frame	38 kg or Heavier ++ as specified	116 kg or 208 kg or as specified	116 kg or 208 kg or as specified

(Note: (1) Dimensions like depth, thickness, size of cover are in cm, (2) For circular manhole, please refer the other specifications provided elsewhere)

Foundation of 1:2:4 concrete shall be 150 mm thick and shall have 150 mm offset.

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.

Brick masonry shall be 230 mm thick in cement mortar 1:5 or as specified in the schedule of work, making brick tapering for longitudinal wall 450 mm from top of cover of the chamber.

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.

All manholes with depths greater than 1 meter shall be provided with 20 mm square or 25 mm round rods the steps shall be fixed in brick masonry wall with 1:2:4 cement concrete with 75mm 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. Cast iron step shall be painted with two coats of approved black bitumastic anti corrosive paint over a coat of primer. Or foot rests shall be PVC coated.

All manholes shall be provided with Cast Iron/ pre cast RCC cover & frames & embedded in reinforced cement concrete slab. Weight of cover & frame & thickness of the slab shall be as specified in schedule of quantities.

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.

RATES

Concreting in foundation, forming the channels, constructing brick masonry and plastering over the brick work, and finishing smooth in side surfaces.
Cover & Frame (if called in schedule of quantities).
Foot rests (if called in schedule of quantities).
Dewatering the pit if found necessary till completion of work.
Making all damage good to original condition after completion of construction work.
All necessary labor, materials and use of tools.

MODE OF MEASUREMENT

The measurement shall be for an Inspection chamber of specified finished internal size and initial depth measured vertically from top of the frame and cover to the invert of chamber. Extra for additional depth or rebate for lesser depth shall be measured in R.M.

MODE OF PAYMENT

The contract rate shall be for unit Inspection chamber of specified internal size and initial depth Extra/Rebate for additional/lesser depth respectively shall be paid in RM.

3.03 Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910, on 12 mm dia steel bar conforming to IS: 1786, having minimum cross section as 23 mmx25 mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.

3.04 Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 fine sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design.

SCOPE

The item includes provision of brick masonry Inspection Chamber of internal size as specified in the schedule of quantities.

MATERIAL

Concreting, Brick work, plastering etc, shall be as per specification as given in general specification under section II.

CONSTRUCTION

Internal dimensions shall be 600x600 mm clear and initial depth shall be as specified in the schedule or as shown in the drawing.

Foundation of 1:2:4 concrete shall be 150 mm thick and shall have 150 mm offset.

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.

Brick masonry shall be 230 mm thick in cement mortar 1:5 or as specified in the schedule of work, making brick tapering for longitudinal wall 450 mm from top of cover of the chamber.

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.

All inspection chambers shall be provided with Cast Iron/ pre cast RCC cover & frames & embedded in reinforced cement concrete slab. Size of cover, Weight of cover & frame &thickness of the slab shall be as specified in schedule of quantities.

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.

RATES

Concreting in foundation, forming the channels, constructing brick masonry and plastering over the brick work, and finishing smooth in side surfaces.
Cover & frame.
Dewatering the pit if found necessary till completion of work.
Making all damage good to original condition after completion of construction work.
All necessary labor, materials and use of tools.

MODE OF MEASUREMENT

The measurement shall be for an Inspection chamber of specified finished internal size and initial depth measured vertically from top of the frame and cover to the invert of chamber. Extra for additional depth or rebate for lesser depth shall be measured in R.M.

MODE OF PAYMENT

The contract rate shall be for unit Inspection chamber of specified internal size and initial depth Extra/Rebate for additional/lesser depth respectively shall be paid in RM.

3.05 Providing, fixing, jointing, testing and commissioning of UPVC pipe (Wash basin, Bathtub, Washing M/c, Urinal waste pipe and for Planter / landscape drain) conforming to IS : 4985 (Pipe Class V - 10 kg / sq.cm) cut to required lengths including all necessary fittings as per IS 7834 and specials such as bends, junctions offsets, access pieces (plain or door) & vent cowl. Fixing at wall / ceiling level supported by G.I. clamps, hangers etc. duly epoxy coated.

SCOPE

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.

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 mentioned in the schedule.

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.

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.

LAYING, FIXING & JOINTING

The pipes shall be carefully laid straight to the correct alignment in gradients as indicated in the drawing. The entire 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.

For underground installation, 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.

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.

Pipe diameter	For Horizontal Runs	For Vertical Runs
20 mm	700 mm	1050 mm
25 mm	750 mm	1125 mm
32 mm	825 mm	1240 mm
40 mm	975 mm	1460 mm
50 mm	975 mm	1460 mm

The jointing of pipes and fittings generally shall be done with approved make cement solvent including 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.

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.

PAINTING

If mentioned in schedule of work, the pipe line shall be painted with two coats of approved oil paint of matching color over a coat of primer.

DEWATERING & CIVIL WORK

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. The rate shall also include for excavation, refilling, etc. civil work required if specified in schedule of quantities. Pipe shall be laid with suitable bedding, encasing as per actual site condition. For concealed piping, chasing, drilling holes in wall, etc. shall be covered under the rate

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 and burner. The material usually burnt is greasy cotton waste which gives out a clear 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.

RATES

Supplying of PVC pipes and fittings of specified diameter & pressure class.
Laying and cutting the pipe wherever necessary and wastage.
Fixing the pipe line with G.I. clamps not less than 2mm thick and G.I. / M.S. nails length not less than 40mm or with UPVC clamps, screws, wooden gutties etc.
Making the solution joint and painting if mentioned in schedule of work the pipe line.
All civil work required for concealed piping
In case of underground pipes, dewatering if necessary till completion of work, excavation, refilling, etc civil work if specified in schedule of quantities.
Testing of pipes.
Making all damage good to original condition after completion of installation work.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for unit running meter length of pipe line laid of fixed. The measurement shall be taken along the center line of pipe. No measurement shall be recorded separately for fittings, making joint, painting, civil work if specified in schedule of quantities and testing.

3.06 Providing, fixing, jointing, testing and commissioning of UPVC pipe Type-B for Soil, Waste & A.C condensate drain pipe upto 160mm dia. confirming to IS 13592 (and for diameter above 160 mm relevant code) cut to required lengths including all necessary fittings and specials such as as 45 or 90 deg. bends, Tee's, Y's, access pipe with rubber ring jointing. Fittings shall conform to IS 14735 and rubber ring shall conform to IS 5382. Fixing at wall / ceiling level supported by galvanized brackets & pvc coated clamps & hangers etc. (For Soil, Waste & A.C condensate drain etc.)

SCOPE

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.

MATERIAL

The pipes shall conforming to IS 13592, UPVC - SWR (Type 'A' or 'B' as specified) and fittings conforming to IS 13591 shall be free from cracks, flaws and defects and shall be U.V. stabilized and 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.

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.

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.

LAYING, FIXING & JOINTING

The pipes shall be carefully laid straight to the correct alignment in gradients as indicated in the drawing. The entire 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.

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/ clips, The clamps/ clips 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.

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.

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.

PAINTING

In case of underground piping, the pipe line shall be painted with two coats of approved oil paint of matching color over a coat of primer.

DEWATERING & CIVIL WORK

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. The rate shall also include for excavation, refilling, etc. civil work required if specified in schedule of quantities. Pipe shall be laid with suitable bedding, encasing as per actual site condition. For concealed piping, chasing, drilling holes in wall, etc. shall be covered under the rate.

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 and burner .The material usually burnt is greasy cotton waste which gives out a clear 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.

RATES

Supplying of UPVC-SWR pipes and fittings of specified diameter.
Laying and cutting the pipe wherever necessary and wastage.
Fixing the pipe line with G.I. clamps not less than 2mm thick and G.I. / M.S. nails length not less than 40mm or with UPVC clamps, screws, wooden gutties etc.
Making the solution joint and painting if mentioned in schedule of work the pipe line.
All civil work required for concealed piping.
In case of underground pipes, dewatering if necessary till completion of work, excavation, refilling, etc civil work if specified in schedule of quantities.
Testing of pipes.
Making all damage good to original condition after completion of installation work.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for unit running meter length of pipe line laid of fixed. The measurement shall be taken along the center line of pipe. No measurement shall be recorded separately for fittings, making joint, painting, civil work if mentioned in schedule of work and testing.

MODE OF PAYMENT

The contract rate shall be for unit running meter length of pipe line laid or fixed.

3.07 Providing and fixing in position uPVC P-trap with 100 mm water seal conforming to IS:14735-90. P traps of self cleaning design joining in ceiling etc. complete with required saddle for connection of washbasin & Shower. Rate to include making of opening in floor, marble / tiles, for fixing grating. Cost shall also be inclusive of hopper/connector arrangment for waste pipe of following sizes

SCOPE

The item pertains to provide P traps with grating including fixing, testing & commissioning.

MATERIAL & FIXING

The trap shall be of cast iron or PVC as specified in schedule of quantities.

The trap shall be provided with SS/ CP brass/ PVC grating of size 100/ 150 mm size as specified in schedule of quantities.

The trap shall have 100 mm floor inlet & 40/ 50/ 75 mm single outlet.

The trap shall be fixed in PCC 1:2:4 100 mm around up to finished floor with water tight finishing & shall be firmly supported on structural floor.

RATES

Ptrap with grating cover.
Jointing & fixing material.
Making all damage good to original condition after completion of installation work.
Testing the entire system and rectification of defects if any.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for each unit of P trap with grating fixed.

MODE OF PAYMENT

The contract rate shall be for each unit of P trap with grating fixed.

3.08 Providing, fixing, jointing, testing and commissioning of UPVC pipe Low Noise SWR system (Wash basin, Bathtub, Washing M/c, Urinal waste pipe and for Planter / landscape drain) conforming to IS : 13592/2013 cut to required lengths including all necessary fittings as per IS 14735 and specials such as bends, junctions offsets, access pieces (plain or door) & vent cowl. Fixing at wall / ceiling level supported by G.I. clamps, hangers etc. duly epoxy coated.

MATERIAL

The pipes shall conforming to DIN EN 12056 and DIN 1986-100 ring fit type including all fittings and accessories complete shall be free from cracks, flaws and defects and shall be U.V. stabilized and 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.

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.

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.

LAYING, FIXING & JOINTING

The pipes shall be carefully laid straight to the correct alignment in gradients as indicated in the drawing. The entire 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.

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 with EPDM Gaskets as required for low noise pipes with suitable UPVC clamps/ clips, The clamps/ clips shall be fixed into the wall with G.I. nails not less than 40 mm long and wooden putties keeping the pipe about 15 mm clear of the wall.

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.

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.

PAINTING

In case of underground piping, the pipe line shall be painted with two coats of approved oil paint of matching color over a coat of primer.

DEWATERING & CIVIL WORK

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. The rate shall also include for excavation, refilling, etc. civil work required if specified in schedule of quantities. Pipe shall be laid with suitable bedding, encasing as per actual site condition. For concealed piping, chasing, drilling holes in wall, etc. shall be covered under the

rate.

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 and burner .The material usually burnt is greasy cotton waste which gives out a clear 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.

RATES

Supplying of UPVC-LOW NOISE SWR pipes and fittings of specified diameter.
Laying and cutting the pipe wherever necessary and wastage.
Fixing the pipe line with G.I. clamps with EPDM Gaskets and G.I. / M.S. nails length not less than 40mm or with UPVC clamps, screws, wooden putties etc.
Making the solution joint and painting if mentioned in schedule of work the pipe line.
All civil work required for concealed piping.
In case of underground pipes, dewatering if necessary till completion of work, excavation, refilling, etc civil work if specified in schedule of quantities.
Testing of pipes.
Making all damage good to original condition after completion of installation work.
All necessary materials, labor and use of tools.

MODE OF MEASUREMENT

The measurement shall be for unit running meter length of pipe line laid of fixed. The measurement shall be taken along the center line of pipe. No measurement shall be recorded separately for fittings, making joint, painting, civil work if mentioned in schedule of work and testing.

MODE OF PAYMENT

The contract rate shall be for unit running meter length of pipe line laid or fixed.

3.09 Providing, fixing, jointing, testing and commissioning of Pre-fabricated HDPE Centralized Grease Separator with BMS compatibility including cutter type submersible pump, medium duty cover, inlet outlet, overflow, sludge suction connection, excavation & backfilling of grease storage tank of cap minimum 400 liters including all accessories complete as required or as per manufacturer specification as and directed by Engineer In charge. suitable for floor mounted or ceiling suspended application, conforming to EN 1825 / DIN 4040-100.

Prefabricated Grease intercepter shall be of HDPE / Polyethylene conforming to EN 1825 / DIN 4040 / 100 suitable for underground installation. The contractor shall refer drawings for selection.

3.10 Providing and Fixing of approved make scupper drain (Side wall type rain water outlet) CI body with C.I grating, with lead flashing around the pipe with one piece lead sheet of 3mm thick set on a layer of old bitumen, threaded adaptor for coupling connection etc with SS screw as per drawings complete with all necessary accessories, as per specification/drawings and as directed by Engineer In Charge. Location: At Terrace.
Purpose: side outlet - Scupper

3.11 Providing and fixing 700 mm long MS hot dip galvanized PUDDLE FLANGES fabricated out of 6 mm thick MS plates of suitable size and IS:1239 / IS:3589 heavy class pipes properly fixed in walls & top slab of tanks. The entire fittings shall be hot dipped galvanized after fabrication. Length shall be minimum 700 mm or wall thickness plus 250 mm on either side (which ever is more) as per specification/ drawings and as directed by Engineer In charge.

SCOPE

Work under this section consists of furnishing all labour, material, equipment & appliances necessary & required to completely install the Puddle Sleeves/ inserts such as inlet, outlet, overflow, drain, ladder, manhole frame & cover including all other material materials required to complete the work for connection to the RCC tanks & Equipments as indicated on the drawings & specifications.

CODES & STANDARDS

Unless specifically mentioned otherwise, all the applicable codes & standards published by the Bureau of Indian Standards & their subsequent revision shall govern in respect of design, workmanship, quality & properties of materials & method of testing.

Nothing in this specification shall relieve the contractor of his responsibility. The material supplied shall comply with the latest applicable Indian standards as applicable & or of best practices.

Following are the standards & codes to be followed as a part of these specifications.

IS: 2062– 1992	:	Structural Steel for general purpose
IS: 226	:	Galvanization of structural steel
IS: 816 & IS: 823	:	Welding of Structural Steel

CONNECTION TO EQUIPMENT

All inlets, outlets, valves, piping & other incidental work connected with installation of mechanical equipment supplied by other agencies shall be carried out by the contractor in accordance with the drawings, requirement for proper performance of equipment, manufacturer's instructions & direction of the Engineer in charge. The equipments to be supplied by other agencies may

generally for Kitchen, Laundry, Irrigation system, Pumps, hot water generators, etc. The work of connections to the various equipments shall be through proper unions & isolating valves in consultation with equipment supplier, engineer in charge.

CONNECTION TO RCC TANKS/ RESERVOIRS

Inlets, outlets, interconnection sleeves & drain outlets for the reservoir shall be made through mild steel bath galvanized puddle sleeves obtained from reputed manufacturers & to be inserted at suitable levels as indicated on the drawings. The contractor shall be responsible for placing the inserts at required level well in advance & before making the final shuttering layout for casting the walls. All puddle sleeves must be fixed in true alignment & level to ensure further connection in proper order all the overhead water tank terraces shall be provided with efficient rain water disposal system. The necessary sleeve in the tank wall shall be provided for running the level controller wires/ probes.

The plate used for fabricating the shall MS 6 mm thick with fillet welding. The length of the puddle sleeve shall be 600 mm minimum unless otherwise specified. Puddle sleeve shall have flanged ends for all sizes. Puddle sleeves shall be hot dip galvanized after fabrication.

The tanks shall be provided with vent pipes of minimum 100 mm diameter with mosquito proof mesh.

The overflow pipe shall be so placed to allow the discharge of water being readily seen. A stop valve shall be provided in the inlet water connection to tank. The outlet pipes shall be fixed approximately 75 mm above the bottom of tank towards which the floor of tank is slopping to enable tank to be emptied for cleaning.

Full way gate valves shall be provided as near the tank as practicable on every outlet pipe from storage tank except overflow pipe.

The floor & walls of the tank shall be tiled with glazed tiles (by other agency) up to overflow level. Alternatively, food grade epoxy paint to be applied.

3.12 Providing, Fixing, Testing and Commissioning of Rain Water Drain Channel with stainless steel single slotted grating. Drain Channel shall have base material as Polymer concrete or equivalent material as approved by Engineer in charge conforming to EN 1433 specification. It should be Pre casted for ready to use. Channel drain shall be of U or V shaped cross section.It should provide water tight laying. Grating should be of 15mm width or as approved by engineer in charge & clear width as specified polymer concrete channel having one side slope including necessary fittings such as inspection element, end cap, side and bottom outlet and any other items required for complete installation. The grating shall have locking system so that it can fit on safety groove and openable grating units for maintenance complete as per specification/drawings and as directed by Engineer In Charge for basement drainage. At final discharge point (sump pit) shall have mesh arrangement.

The Channel shall be of specification EN 1433 for External Application. It shall be Pre casted of V

Shape cross section, the material of construction is Polymer Concrete and it has integrated edge rail and safety groove. It should provide water tight laying, the grating will have a locking system so that it can fit on safety groove. The Gratings are as per load class A15, B125, C250, D400 and E600 of materials C.I. or S.S. or G.I. depending on the application. The Channels shall have tongue & groove facility for the Interlocking for uniformity of a line.

3.13 Providing, Supplying, lowering, laying and jointing of Form Core Class SN8 Structured Wall Polyethylene piping systems (Pipe with online/offline coupler and elastomeric sealing ring) with non-smooth External Annular Corrugated and Smooth Internal Surfaces (Double Wall) for non-pressure underground sewerage and Drainage application as per IS 16098 (P2) including all local and central taxes, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to the departmental stores etc complete. (ID Dia)

The uPVC pipe-in-pipe Foam Core size & pressure class shall be as specified in schedule of quantities.

The pipes shall conform to IS: 16098 with its latest edition.

It shall be injection molded type.

The connector shall be visually inspected before laying & shall be free from cracks, flaws and defects and shall be able to withstand a pressure as mentioned in the schedule of quantities. Cracked & damaged connector shall be removed from the site by the contractor at his own cost. All the connectors shall be thoroughly cleaned with brush and washed if necessary to remove any accumulated stone, soil or dirt inside and outside surfaces.

Workmanship:

The connector of specified diameter shall be fixed as directed in the manufacturer's manual. Due to thermal expansion of rigid P.V.C. Pipes, due allowance shall be made particularly in over ground pipe lines for any change in length of pipe line which may occur during installation or when pipe line is in service. The pipe shall be joined using solvent cement specified for the type of pipe by the manufacturer.
All pipes shall be fixed in gradient towards the outfalls of drains
Mode of Measurement and Payment:

The rate includes cost of all labor and materials, tools and equipments etc. required for satisfactory completion of the item. The rate shall be for a unit of one number.

3.14 Supply and installing Rain Water Percolation pits - 3000 mm in diameter up to 3200 mm deep, bottom 500 mm filled with boulders 150 - 230 mm size, over which one no. UPVC 160 mm dia (4.0 kg/cm2) perforated pipe with 8 mm dia perforations protected by a cowl on upper end 2100 mm long, surrounding filled with broken bricks up to 1000 mm, pebbles 40 to 50 mm up to 400 mm, Gravel 15 to 25 mm up to 400 mm and upper most layer of 300 mm with coarse sand of 3 to 5 mm. The top 600 mm shall be left open, with RCC grated cover on top.

Section 4.00 Equipment

4.01 Supply, installation, testing & commissioning of Hydropneumatic system with vertical inline Multistage booster centrifugal SS pump-motor sets, balancing tank, mounting skid, foot valves, suction & delivery pipe, fittings, valves. The scope shall also include pressure switches, level switches, level indicator, VFD based control panel with starters, protections, relays, cables, interlocaking with level & pressure switches, Suction Delevery Piping all Connection, valves etc. complete for Water Supply.

1.0 GENERAL

1.1 The item includes the Pumps (Vertical/Horizontal centrifugal type), Pressure vessels, pressure switches, gauges, pressure transmitter on delivery manifold, pump suction & delivery piping, manifolds & valves, flexible bellows, Fixed speed/ variable frequency drive, control panels, Microprocessor based operation) and all accessories including installation, testing & commissioning.

2.0 PUMP-MOTOR SET

2.1 DESIGN & CONSTRUCTION FEATURES

2.2 Two types of pumps i.e. inline vertical multistage or horizontal type centrifugal pump shall be provided. Variable frequency drive shall be provided with one of the installed pump – if specified in Schedule of quantity.

2.3 The pump motor set and shall be suitable for 3 Ph., 415 V, 50 Hz. AC power supply and having 1500/ 2900 RPM speed. The pump shall be installed with isolation gate/ butterfly valve, non return valve, etc. The detailed specification for pump & motor is as below :

2.4 The design and manufacture of the pump shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed.

2.5 The pump shall be capable of developing required total head at rated capacity. Impeller shall be closed type and shall be dynamically balanced. The pump shall have non overloading characteristics.

2.6 The casing shall be of rigid construction and shall have side suction and side delivery in case of vertical multistage pump and side suction and central delivery in case of horizontal centrifugal pump.

2.7 The pump shall have very small length suction and delivery pipe connections which will result in minimum friction loss.

2.8 Impeller shall be of one piece and shall be of SS CF8 M.

2.9 The shaft shall be of S.S. and its surface shall be properly finished.

2.10 Shaft sleeves shall be provided to protect shaft from any damage.

2.11 Bearing shall be ball or roller type.

2.12 Mechanical seal shall be provided to avoid any leakage.

2.13 Pump shall be mounted on a concrete foundation, projecting at least 15 CM above finished floor level. The pumps base shall be set on an anti vibration pad.

2.14 All the parts of the pumps that are in contact with water e.g. shaft, impeller etc. shall be hot dip galvanized or of stainless steel construction.

2.15 Pumps shall be so selected that the design duty point is within 5% of the maximum efficiency point. Shut off head shall be 120% of duty point head.

2.16 All pumps and motors shall be of minimum vibration and noise level during operation. Vibration isolators shall be provided for all pump sets.

2.17 Facilities shall be provided to prevent starting of pumps when the water tank is at low water level. An indicator for this low water level alarm shall be provided.

2.18 Facilities to select which pump to be duty pump and standby pump shall be provided and be interchangeable.

2.19 Leakage from pump gland shall be drained to the nearest floor waste.

2.20 Pump shall be driven by directly coupled squirrel cage induction motor having TEFC enclosure, IP 55 protection & shall be of Class F insulation.

2.21 Pump motors above 7.5 kW shall be equipped with a spacer coupling which allows changing of shaft seals without removing the motor.

2.22 INSPECTION & TESTING

2.23 The pump shall be offered for visual inspection before dispatch.

2.24 Material test certificates for the various pump components shall be furnished for purchaser's approval.

3.0 SYSTEM DESCRIPTION

3.1 The system operation will be such that the initial small water demand shall be met by the charged diaphragm pressure vessel. When the water demand continue the system pressure will dip to a preset pump cut-in point when the lead pump starts to operate at reduced speed through the variable speed drive. However, if the system pressure be still below the pre-set value, the

controller continuously increases pump speed to meet the system demand. When the lead pump is not able to meet the system pressure at full speed, the second pump also starts to operate.

3.2 At peak demand all the pumps operate, similarly, if there is a drop in water demand the duty pump speed starts to reduce, then standby pumps cuts-off, followed by stopping of the duty pump.

3.3 The closed diaphragm pressure vessel shall be of polyethylene material with a pressure gauge and isolating valve. The interior shall be of non-toxic lining suitable for use with potable water. The vessel shall be manufactured to conform to ASME pressure vessel code/ standards.

3.4 The system shall be under the control of a microprocessor based control panel.

3.5 A pressure transmitter shall detect the pressure at the delivery manifold and feedback to the microprocessor control panel via control circuit.

3.6 The system shall incorporate a frequency converter or frequency converter motors on the pumps and the pressure transmitter shall register the actual pressure on the discharge side.

3.7 The variable frequency drive pumping system shall maintain a constant pressure regardless of the system demand. If there is a drop in pressure outside the preset point, the Variable Frequency Drive (VFD) pump shall start to run until the pressure increases to the preset limit, or it will continue to increase the pump speeds to the upper limit of the frequency. If the water system demand still cannot be met, the second pump shall be called in to run, the VFD will then alter the pump speed to meet the preset pressure point. If the set point is still unable to be met, the third pump is then activated to run (in case of 3 pumps units).

3.8 This shall be achieved by continuously varying the motor speed of the duty pump according to the demand up to a maximum designed capacity.

3.9 Under decreasing hydraulic demand the reverse sequence to the above description shall apply. Alternatively pumping system shall be with fixed speed drive motor. By getting the signal from microprocessor based control panel through pressure transmitter, pumps will operate in sequence & vice a versa.

3.10 The frequency converter shall be linked to the motor of the duty pump for continuous speed adjustment and ultimately the water delivery shall be maintained at constant pressure at the pre-set value.

4.0 CONTROL PANEL

4.1 The motor control panel shall be equipped with all the necessary electrical components including a microprocessor control unit and a frequency drive. The control panel and the microprocessor shall cover the followings functions.

4.2 Flexibility and simplicity in allowing the necessary re-adjustment of the pumping system pre-set delivery pressure to operate the pumps within the specified maximum and minimum delivery

ranges.

4.3 Automatic changeover of the pumps to be controlled by the microprocessor which dictates the duty and standby pumps.

4.4 When the system has not been operated for more than 24 hours, it shall automatically start the pumps for a few seconds/ day to ensure the pumps readiness at all times. The standby pumps shall be activated upon failure of duty pump(s).

4.5 In event of control failure, the pumps shall be able to be start/ stopped manually at the local panel by means of pressure switches.

4.6 The microprocessor control panel shall be able to cut-off the pumping system when excess pressure is registered in the discharge common manifold.

4.7 The system shall have the capability of receiving input signal concerning reduced water level in suction tanks and shall have control mechanisms to prevent the pumps form running dry.

4.8 Automatically starting the pumps when the water level is back to normal.

4.9 In case of pump failure due to motor overload, the standby pump is switched on automatically. Alarm signal is displayed on the LCD Display unit and alarm lights are activated.

4.10 Functions to limit the no. of start/ stop of pumps per hour.

4.11 The system control panel shall incorporate LCD Display.

5.0 OPERATION OF CONTROL PANEL

5.1 Auto mode

5.2 The desired delivery pressure within the range specified, shall be set at the control panel. The pressure transmitter shall detect the delivery pressure continuously and give feedback to the microprocessor which will control the variable speed drive frequency converter for speed control of the duty pump. When demand increases, the subsequent pumps in the system will be activated to boost up the pressure. Ultimately the duty pump set shall be operated fully automatically to maintain the delivery pressure constantly at the desired set value.

5.3 Manual Mode

5.4 The on/ off function of the pumps shall be manually adjusted at the microprocessor located at the local control panel.

5.5 Frequency Control By-pass Mode

5.6 All the pump sets shall be started/ stopped automatically with the pump output at fixed maximum rotational speed. All the control and protection functions shall remain active. The cut in/ cut out pressure shall be internally calculated by the microprocessor for each pump.

6.0 ELECTRICAL COMPONENT

6.1 All circuit breakers, thermal overloads and contactors shall be of reputable make acceptable to the architect. Electrical supply to the pump controller shall be protected using an isolating circuit breaker.

7.0 METHOD OF STARTING

7.1 The panel shall be built to start the pumps in suitable starting modes, i.e. D.O.L., Star/ Delta, or using Soft Starters.

8.0 PUMP PRESSURE VESSEL

8.1 Diaphragm type pressure vessels shall be provided as shown on the drawings. They shall be incorporated into the system so that during normal operation the pump shall not need to be start within 30 seconds of it switching off in order to prevent the pump hunting.

8.2 The pressure vessel shall be of adequate capacity to accommodate a considerable fluctuation in water demand by the system with minimum start/ stop cycles of the pumps. The vessel shall be constructed of steel plate built to ASME Standards for Unfired Pressure Vessel. A rubber diaphragm shall be provided in the vessel for separating the water and pre-charge nitrogen. The pre-charge pressure shall be adjustable and charging port with non-return device shall be provided. The adjustable cut-in and cut-off pressure unit for the pumps shall be built-in at the vessel to suit the system.

9.0 ACCESSORIES

9.1 The system shall be provided with all accessories such as base plate, mounting pads, foundation bolts, foot valves, pressure gauge, pressure switches, pressure transmitter, level indicator, isolation valve for pressure vessel, etc. all accessories required for proper and safe operation shall be furnished with the pumps.

10.0 SUCTION AND DELIVERY PIPE, FITTINGS, FLANGES & VLAVES

10.1 All suction, delivery and header pipe shall be GI & shall conform to IS: 1239, medium/ heavy duty. Fittings shall be as per the pipe thickness. All pipes shall have flanges connection & pipe shall conform to BS 10, Table - D. All hardware shall be zinc plated. The system shall be equipped with suction & delivery valves flanged valves. On suction side ball/gate valve shall be provided while on delivery side ball/ butterfly valves shall be provided. Also, spring operated check valves shall be provided on delivery side of each pump & on delivery header. In case of negative suction foot valve shall be provided for each pump suction or suction header as specified in data sheet. Flexible bellows shall be provided on suction & delivery side of each pump.

11.0 TESTING

11.1 Hydrostatic test shall be carried out at 1.5 times the maximum discharge pressure.

11.2 For electrical accessories, necessary tests shall be performed or factory test certificate shall be furnished.

12.0 DRAWINGS

Following drawings shall be furnished by the vendor:

12.1 Overall dimensional drawing.
12.2 Pump performance curves..
12.3 Cross-sectional drawings.
12.4 Panel GA drawing.
12.5 Bill of Material and Material of Construction.

13.0 TECHNICAL DATA SHEET FOR HYDROPNEUMATIC SYSTEM

SR.	PARTICULAR	SPECIFICATIONS
1.0	**SYSTEM :**	
1.1	Application	Domestic / Flushing water
1.2	System capacity	
1.3	System head	
1.4	Operating hrs.	
1.5	Location	
2.0	**PRESSURE VESSEL**	
2.1	Capacity	As per BOQ
2.2	No. of Unit	As per BOQ
2.3	Material of Construction	M.S. conforming to IS 2062 / FRP
2.4	Shell thickness	8 mm / Suitable for 8 Kg/cm2 pressure rating.
2.5	Dished end thickness	10 mm/ Suitable for 10 Kg/cm2 pressure rating.
2.6	Test Pressure	10 kg / cm2 minimum
2.7	Painting	Epoxy
2.8	Type of Air Compressor	Oil free, Teflon coated / Inbuilt Air cell
2.9	Tank outlet size	As per Manufacture’s configuration
3.0	**PUMPS**	
3.1	Type	Vertical Multistage/ Horizontal centrifugal
3.2	Number of Units	As per BOQ
3.3	Design capacity / pump	As per BOQ
3.4	Total head at design capacity	As per BOQ
3.5	Suction Pressure at rated capacity (NPSHa)	Positive Suction
3.6	Speed	1500 / 2900 RPM
3.7	**PUMP – FEATURE OF**	

SR.	PARTICULAR	SPECIFICATIONS
	CONSTRUCTION	
3.7.1	Impeller	Closed
3.7.2	Shaft	Coupled
3.7.3	Drive Transmission	Direct
3.7.4	Seal	Gland Packing
3.7.5	Mounting	Common base plate
3.7.6	No. of stage	Single
3.7.7	Starter	DOL / VFD
3.7.8	Flange drilling	As per BS 10, Table D, flat face with off centre bolt holes
3.8	**PUMP - MATERIAL OF CONSTRUCTION**	
3.8.1	Base plate	M.S. IS 226
3.8.2	Pump Casing	SS /C.I.
3.8.3	Impeller	SS CF 8 M
3.8.4	Shaft	S.S AISI 410
3.8.5	Wearing Ring	SS 316
3.8.6	Painting	Epoxy
3.8.7	Hardware in contact with water	Hot dipped galvanized
3.8.8	Companion flanges	M.S., BS 10, Table D
4.0	**INDUCTION MOTOR**	
4.1	Type	Squirrel cage Induction
4.2	Mfg. Standard	IS 325
4.3	Rated Voltage	415 Volts, 3 Phase, 50 Hz., AC
4.4	Voltage and frequency variation	± 10% voltage variation ± 5% frequency variation ± 10% combined voltage and frequency variation
4.5	Speed in RPM	1500/2900 RPM
4.6	Class of Insulation	Class B
4.7	Degree of Protection	IP 55
5.0	**ACCESSORIES & SERVICES REQUIRED**	
5.1	Base Plate	YES
5.2	Foundation bolts	YES
5.3	Companion flanges	YES
5.4	Spare parts required	YES
5.5	Maintenance tools required	YES
5.6	Mounting anti vibration pads	YES
5.7	Pressure Gauges	YES, on delivery of each pump & on delivery header
5.8	Pressure Switches	YES, on delivery of each pump & on delivery header

SR.	PARTICULAR	SPECIFICATIONS
5.9	Foot Valve	Yes in case of negative suction
6.0	Suction & delivery piping	GI Class B / C as specified in BOQ
7.0	Suction, delivery valves & header valves	Required, flanged Cast Iron valves with SS internal parts Flanged Ball / Gate valve on suction and Flanged Ball / Butterfly valve on delivery of each pump & Flanged Non slam, spring operated dual plate type check valve on delivery side of each pump & on header Flexible bellows on suction & delivery side of each pump
8.0	Control Panel	DOL/Star Delta / With VFD (if specified in BOQ) Power / control cable from starter to pump to be provided
9.0	Level Indicator	Required for 0-5 mtr. Range and shall be panel mounted and interlocking with pump
10.0	Hardware	Zinc coated

14.0 RATES

14.1 Pump-Motor sets.
14.2 Pressure vessel with isolation valves.
14.3 Base plate, foundation bolts, anti vibration pads.
14.4 Pump suction – delivery pipe & suction & delivery manifolds.
14.5 Foot valves in case of negative suction.
14.6 Pump Suction isolation valve, Pump delivery & delivery manifold isolation valve & 27.14.7 NRV, suction manifold isolation valve, pump suction & delivery flexible bellows.
14.7 Pressure gauges, switches & panel mounted Pressure transmitter, level indicator to be interlocked with pump operation.
14.8 Microprocessor based control panel with all electrical components, protections, interlocks, cable from control panel to pump.
14.9 Variable frequency drive/drives if called in BOQ.
14.10 All electrical accessories.
14.11 All material like flanges, hardware, gaskets, etc. required for installation.
14.12 Installation, testing & commissioning.
14.13 Making all damage good to original condition after completion of work.
14.14 All necessary labor, material and use of tools.

15.0 MODE OF MEASUREMENT

15.1 The measurement shall be for one set or one job

16.0 MODE OF PAYMENT

16.1 The contract rate shall be for one set or one job

4.02 Providing, fixing, testing & commissioning of FRP water softening plant (suitable for 4 Kg/Sqcm working pressure) complete with initial charge with T-40 NA Resin, multiport valve with built in ejector for controlling all operations), regeneration system, pressure gauge at inlet, outlet and back wash (each with isolation cock), valves, fittings and water hardness testing kit & associated works. Softener shall be suitable for duty mention in BOQ:

GENERAL

Scope

This section of the contract involves the design, supply, installation, testing and commissioning of the complete Water Treatment plant for domestic water and swimming pool water.

All installation work shall comply with the latest rules and regulations.

The work embraced by this specifications covers the design, submission to authorities, supply, delivery on site, installation, testing, commissioning and maintenance of the Water treatment system installation of the building.

The scope of work shall include the following (list is indicative and not exhaustive) :

- Complete Raw Water Treatment System. The Contractor shall be responsible for carrying out water analysis for the raw water from borewell / tanker supply and design all system components/equipment so as to achieve the potable water quality as per specified Standards SP:35 (S&T 1987) & IS 10500.
- The Raw Water Treatment System as a minimum shall consist of feed pumps, filters with back wash provisions with all accessories complete with all controls, softner, U/V Treatment System, PH automatic control and monitoring system, electrical panels, cabling, etc.
- All the pipework between the raw water tanks, treated water tanks and all the interconnecting pipework amongst the Water Treatment pumps and other equipment.
- Complete Swimming Pool System including all equipment such as the filtration pumps, sand filters, chemical dosing system, UV Units, complete pipework, nozzles, swimming pool accessories like suction sweepers etc.
- Electrical equipment and installation work including the necessary wiring etc. in Control panel.
- Painting and labelling of pipework and equipment;
- Provision of all hold down bolts, spigots struts and the like required to be built in during construction;
- Provision of dry contacts to BMS indicating the status of the pumps and pressure vessel in form of hardware interfacing panels inside each control panels of all pumps.
- Provision of all level switches, flow switches and other sensing devices for status indication.
- All interfacing work with other trades.
- Testing and commissioning and balancing of the complete Water Treatment system;
- Provision of twelve (12) months maintenance and breakdown services;
- Provisions of operating instructions and maintenance manuals;
- Provision of spare parts;
- Training of the employer's staff for proper operation of the entire systems;

- Liaison with Local Authorities to obtain all necessary certificates and approvals, including the completion of all submission drawings, forms and payment of any fees and charges. All the costs for all the tests required by Local Authorities shall be included. To attend to any Authorities inspection regardless of whether this inspection is carried out after the defect liability period;
- Provisions of the necessary installation which include pumping works, pipework within the pumping unit up to suction and discharge manifolds, conduit and control wiring, etc. to form a workable system required;
- All other works and systems as specified in the Contract document and or shown on the drawings.
- All cutting, patching, framing up, furring in, chasing and making good associated with the building construction for the passage of pipes, conduits and the like including providing GI pipes sleeves of required size corresponding to pipe dia, wherever pipes crossing fire rated walls and floors and sealing with glass wool in between and fire sealent compound on either end. Details on shop drawings shall also be provided.

General

Equipment offered for supply and installation shall include the following:

All minor items and incidental work, equipment accessories and materials may not be specifically mentioned but are required for the proper completion of the installations in accordance with the true intent and meaning of this Specification.

All necessary safety devices for the protection of personnel against injury and the protection of plant and equipment against damage including relief valves, belt guards, fan inlet and/or discharge guards, safety railing, effective earthing of electrical components, electrical interlocks, warning lights and alarms.

Readily accessible, dust-proof lubricating facilities on all moving parts and equipment including provision for cleaning all lubricating lines and bearings and charging same with the correct lubricants after installation but prior to testing and commissioning.

Clearly visible and robust manufacturer's name-plates permanently fitted each and every item of equipment and showing the manufacturer's name, type and/or model number, serial number, and all essential operating data such as speed, capacity, voltage, current draw, etc.

The Contractor also shall allow provision for the inspection of all plant and equipment by the manufacturer or his licensed representative, at least twice during the course of the installation.

Filtration

Scope

The scope of this section comprises the supply, installation and commissioning of FRP composite vessel filter.

FRP Composite Vessel Filter

The filter shall be constructed of FRP material with inner shell of integrated polyethylene, polypropylene and other material as per manufacturer's standard.

The inter distribution system and the underbed draw off system shall be of Hub & Lateral type of polypropylene material. The filter shall be provide with manhole cover, hand hole, flanged outlet for piping / valve connection and adequate tripod with skid self supporting structure for making the installation completed. The filter shall also be provided with vacuums breaking connection / accessories to avoid any collapse of internal lining. All filters shall be provided with lifting lugs. The filter bed depth shall be 1500 mm.

Face Piping

Each filter shall be provided with interconnecting face piping comprising of inlet, outlet, and backwash complete with valves.

Accessories

Each filter shall be provided with following accessories :-

a. Air release valve with connecting piping.

b. 100 mm dia dial bourden type gunmetal pressure gauges with brass isolation ball valve and connection piping on inlet and outlet.

c. Sampling valves (ball valves) on raw water inlet and filtered water outlet.

d. Individual drain connection with brass fullway ball valve for each filter.

Filter Media

The filter media shall comprise of gravel / silica of various grade in varying thickness. The cut-section of the filter along with filter media detail shall be subject to approval by the Consultant.

Piping

The pipes and fittings in the domestic Water Treatment plant room shall be GI class `C' (heavy class) conforming to IS: 1239 (Part-I) for pipes and IS:1879 (Part 1 to 10) for malleable cast iron fittings.

Pumps

Pumps shall be vertical, centrifugal, multistage directly coupled to motor. Provision of pump with pump head & base of cast iron and other parts in SS 304 shall be made for pumps required in Hydropneumatic System, swimming pool and water fountain re-circulation system. Impeller shall be hydraulically balanced and keyed to shaft. Pump shall be mounted on a concrete foundation, projecting at least 15 CM above finished floor level. The pumps base shall be set on a vibration elimination pad. The pump shall be lubricated in strict accordance with the manufacturer's instructions and shall be factory aligned prior to shipment. All motors and bases shall be painted with approved finish shop coat of paint. The pump shall be selected for the lowest operating noise level and shall be complete with flexible connections, valves, and pressure gauges. The pumps shall include cost of foundation channel complete.

Alum / Soda Ash Dosers

All dosers shall be of the electronic metering plunger type confirming to the requirements specified in the Bill of Quantities. They shall be complete with low level switch, low level alarm, tank and interconnecting piping.

UV Unit

UV unit shall be complete with reactor, cabinet housing, cabinet cooling, treatment chamber, electrical panel, temperature safety control, lampout alert, UV radiometer along with UV monitoring system and UV monitoring readout panel. The UV Dosage should be > 30,000 uW – Sec / sq.cm. The lamps should be selected based upon the flow requirement of respective unit.

Surflow Nozzles

Nozzles shall be constructed of unalterable UV resistant ABS plastic & shall be designed for low noise and smooth flow at desired rate. The nozzle shall be suitable for three adjustable set positions and shall be connected through ferrule / saddle connection to CILA pipe equidistant positioned on the swimming pool floor.

Suction Sweeper

Suction sweeper shall consists of centrifugal pump directly coupled through flexible coupling to 400/440 volts, 3 phase 50 cycles motor and both units mounted on a trolley complete with suitable starter, 30 meters (appx.) of cable terminating with a three pin plug with 600 mm wide suction

sweeper head with wheels, spring loaded brush and towing rope, 20 meters length of internally armoured hose with necessary coupling and floats. Contractor to submit the technical detail and catalogue of the suction sweeper model along with the bid for the review & approval of the Owner /Consultant.

Water Quality

The domestic water treatment basis of design is as per raw water analysis.. Contractor shall get the raw water analysis done at his own expense (in accordance to IS:10500 prior to submission of the water treatment scheme.

The contractor shall ensure domestic water of potable water standard after the treatment system. The acceptable standard of potable water shall be in accordance to SP:35 S & T : 1987 as per acceptable limits.

Floatless Type Level Switch In Water Tanks

The Contractor shall supply and install floatless type switch probes in the water tanks as indicated below and shown on the drawings.

Raw Water Tanks

- High level alarm (over-flow);
- Low level alarm;
- Low level cut-out for raw water pumps;
- Earthing probe.

Treated Water Tank

- High level alarm (over-flow);
- Low level alarm;
- Low water level cut-out for the hydropneumatics pumps;
- Earthing probe.

Each probe shall be of the correct length for the particular application and tank location. Electrodes shall be of polished stainless steel 20 mm OD. Electrode holders shall be weatherproof in all respect.

The earthing probes shall be connected and wired to the building earth systems of the building.

The level switch set shall operate with a stepped down voltage at 24V maximum. Stepped down transformers shall be provided for each set of control probes and shall be installed inside centralised control cubicles inside pump room.

Control Of Duty / Standby Pumps

Operation of the duty and standby pumps shall be carried out by the following method:

a Automatically by means of pressure sensor (i.e. pressure switches);

b Manually by means of a local start/stop push buttons on pump local motor control panel and emergency stop switch.

The pressure switch shall be installed next to the manual release valve. When the level drops to the pre-determined level, a signal will be sent to the pump local motor control panel to start the pump.

Automatic controls shall be operated by electronic, floatless type level switches.

Pump Indicator

The following audible and visible indication shall be provided at the pump local control panels as applicable:

a Red "overflow level" indicator with buzzer for the associated water tanks;

b Amber "extra high water level" indicator for the associated water tank;

c Amber "high water level" indicator;

d Amber "low water level" indicator;
e Red "pump trip" indicator for each pump;
f Green "pump on" indicator for each pump;
g " Pump electrical supply healthy" indicator for each pump;

4.03 Providing & erecting SS 304 water cooler having storage capacity 80 ltr & cooling capacity 40 ltr. Per hour @ an ambient temp of 45 deg. C. the outlet temp of the water should drop by 15 C. within a hour. The water cooler should be should be comprising of hermitically sealed compressor, fan motor, condensing unit, water tank surrounded by evaporating coil, thermostats, relay etc. complete with necessary inlet & outlet connation with RO & drinking water tap. The body of the water cooler will be made of stainless steel & Supplying & erecting 5 stage single reverse osmosis water purification with UV system M.S. powder coated frame, profiler housing with 5 micron wound filter size 10", carbon block filter with size 10" suitable booster DC pump capacity 1.8LPM with 48watts inline type post carbon filter auto low & high pressure switches with following size of storage tank & LPH capacity & erected as directed

1.0 SCOPE (Item Description)

1.1 The item pertains to provide water coolers of capacity as specified in schedule of quantities including fixing, testing & commissioning.

2.0 MATERIAL & FIXING

2.1 Water cooler shall be exterior stainless steel construction. It shall have PUF or suitable insulation to reduce power consumption.
2.2 Water cooler shall be with inbuilt R.O. if specified in schedule of quantities & shall be capable of supply water to the drinking standard i.e. IS: 10500 with its latest edition.
2.3 The reverse osmosis plant shall be designed for a maximum of 10 hour operation cycle per day.
2.4 The water treatment system has been designed on the basis of raw water analysis report from the existing water supply network.
2.5 The raw water analysis of the water source would be provided by the contractor as per the table 2 mentioned below. Contractor shall get the raw water analysis done at his own expense (in accordance to IS:10500 prior to submission of the water treatment scheme.
2.6 The contractor shall ensure domestic water of potable water standard after the treatment system. The acceptable standard of potable water shall be in accordance to SP:35 S & T : 1987 as per acceptable limits.
2.7 Compressor in the cooler shall be rugged & hermetically sealed for any leakages. Surge drums in the refrigerant circuit shall be well enough to prevent leakage in compressor unit.
2.8 The capacity shall be as per schedule of quantities.
2.9 Nominal cooling capacity through a drop of temperature shall conform to IS: 11475.
2.10 Cooler shall be provided with standard length electrical cable & a suitable plug.
2.11 Fixing of the water cooler shall be floor mounted with rubber mounted adjustable jack bolts as per the flooring.

3.0 RATES

3.1 Water cooler including RO with electrical cable & a plug.
3.2 Mounting pads, Brackets, Accessories & Hardware.
3.3 Making all damage good to original condition after completion of installation work.
3.4 Testing the entire system and rectification of defects if any.
3.5 All necessary materials, labor and use of tools.

4.0 MODE OF MEASUREMENT

4.1 The measurement shall be for each unit of Water Cooler fixed.

5.0 MODE OF PAYMENT

5.1 The contract rate shall be for each unit of Water Cooler fixed.

4.04 Supply, installation, testing and commissioning of continuous duty submersible centrifugal non-clogging drainage pumps complete with 3 phase motor, level sensor, control panel with all necessary protection and mechanical seal etc with Cabling upto Control Panel etc complete .Vendor to submit proposed pump model with duty curve.
Solid Handling : 20-30 MM
Purpose : Waste water / sullage Drainage
MOC : CI Body / Impeller & SS 304 Shaft

1.0 GENERAL

1.1 This specification covers the supply, installation, testing & commissioning of Submersible sump pump. The scope also includes delivery piping up to 15 meter with necessary fittings & starter panel, etc. Each pump shall have PVC / PP isolation gate/ ball valve & NRV at pump delivery side.

2.0 DESIGN & CONSTRUCTION FEATURES

2.1 These shall be fully submersible with a fully submersible motor.

2.2 The pumps shall be provided with an automatic level controller and all interconnecting power and control cabling which shall cause the pumps to operate when the water level in the sump rises to a preset level and stop when the preset low level is reached.

2.3 Pumps for drainage shall be single stage, single entry.

2.4 Pump shall be C.I. casing and C.I. two vane open type with a dynamically balanced impeller connected to a common shaft of the motor.

2.5 The vane for Sewage sump pump will be open type, while for storm drainage pump, etc. it will be of semi open type. The MOC of the sump shall be in accordance to schedule of quantity.

2.6 Stuffing box shall be provided with mechanical seals.

2.7 Each pump shall be provided with a suitably rated induction motor suitable for 230/415 volts, 1/3 phase, 50 Hz A.C. power supply.

2.8 Each pump shall be provided with in built liquid level controller for operating the pump between predetermined levels.

2.9 The pumping set shall be for stationary application and shall be provided with pump connector unit. The delivery pipe shall be joined to the pump through a rubber diaphragm, and bend and guide pipe for easy installation.

2.10 Pump shall be provided with all accessories and devices necessary and required for the pump to make it a complete working system.

2.11 Sump pump shall be complete with level controllers, power and control switch gear, Auto/ off/ Manual switches, pumps priority selections and control and power cabling up to motor and controller/ probes etc. (Including earthing).

2.12 Level control shall be such that one pump starts on required level, 2nd pump cuts in at high level and alarms is given at extra high level. All level controllers shall be provided with remote level indications.

3.0 MOTOR DESIGN

3.1 The pump motor shall be a squirrel cage induction, housed in air filled water tight enclosure. Oil filled motors are not acceptable. The stator windings shall be Class "F" insulation (155 C° or 311 F°) for general usage and class `H' insulation (180 C° or 317-8 grade 2) for submersible type.

3.2 The stator shall be heat shrunk fitted into the enclosure and shall not use bolts, pins or other fasteners that penetrate through the stator enclosure. The starter shall be equipped with a thermal switch embedded in series in the coils of the stator windings to protect the stator from wheel.

3.3 The motors shall be designed for continuous running duty type at 230/ 415 volts, 1/3 phase, 50 Hz power supply and capable of sustaining a minimum of 20 starts/stops per hour.

4.0 RATES

4.1 Pump-Motor sets.
4.2 Pump suction – delivery pipe & suction & delivery manifolds.
4.3 Pump delivery & delivery manifold isolation valve & NRV.
4.4 Level indicator to be interlocked with pump operation.
4.5 Starter panel with all electrical components, protections, interlocks, cable from starter to pump.
4.6 All material like flanges, hardware, gaskets, etc. required for installation.
4.7 Installation, testing & commissioning.
4.8 Making all damage good to original condition after completion of work.
4.9 All necessary labor, material and use of tools.

5.0 MODE OF MEASUREMENT

5.1 The measurement shall be for one set including working & stand by units.

6.0 MODE OF PAYMENT

6.1 The contract rate shall be for one set including working & stand by units.

APPROVED MAKE LIST

SR	ITEM DESCRIPTION	MAKE
01	Sanitary ware	Hindware / Jaquar
02	C P Fittings & Bathroom Accessories	Hindware / Jaquar
03	Stainless Steel Sink	Nirali/ Neelkanth/ Futura
04	C P Grating	Chilly/ Futura
05	Ball Valve	Sant/ Zoloto/ Honeywell
06	Gun Metal Wheel Valve	Sant/ Zoloto/ Honeywell
07	Pressure Reducing Valve	Sant/ Zoloto/ Honeywell
08	Butterfly Valve	Sant/ Zoloto/ Honeywell
09	Gun Metal - Non Return Valve	Sant/ Zoloto/ Honeywell
10	Cast Iron Manhole	NECO or Equivalent
11	Cast Iron Grating	NECO or Equivalent
12	UPVC Pipes/ Fittings	Astral/ Supreme/ Ashirvad
13	CPVC Pipes/ Fittings	Astral/ Supreme/ Ashirvad
14	SWR Pipes/Fittings	Astral/ Supreme/ Ashirvad
15	Water Meter	Sant/ Kranti/ Capstan
16	Water Level Indicator	Sant/ Sigma/ Gelco/ Honeywell
17	Hydro Pneumatic System	Willo/ Grundfos/ Xylem
18	Water Softener System	Pentair/ Ion Exchange/ PowerH2O/ Gopani/ Cleantech
19	Submersible Pumps	Franklin/ Grundfos/ Xylem
20	De watering Pump	Franklin/ Grundfos/ Xylem
21	Mud pump	Franklin/ Grundfos/ Xylem
22	Domestic RO system	Pentair/ Ion Exchange/ PowerH2O/ Gopani/ Cleantech
23	Water Cooler	Blue star/ Voltas/ Usha
24	Electric Geyser	A O Smith/ Venus/ Bajaj
25	Float Valve for OHT	Leader or Equivalent
26	Domestic R.O. System and U.V. system	PowerH2O/ Eureka Forbes/ Kent/ Gopani/ Cleantech

NOTE: 1) ALL MATERIALS SHALL CONFORM TO THE RELEVANT STANDARDS OR CODE OF BUREAU OF INDIAN STANDARDS AND SHALL HAVE ISI MARK VALIDATED FOR THE PERIOD OF INSTALLATION AND TAKE OVER. THEY SHALL ALSO FULFIL ALL HYDRAULIC TESTS AT SITE AND SHALL BE FREE FROM ALL NOTICEABLE DEFICIENCIES DURING THE GUARANTEE PERIOD AS WELL.

2) ALL MAKES AND PRODUCT CATALOGUE NUMBERS SHOULD BE GOT APPROVED FROM ARCHITECT BEFORE PROCUREMENT BY THE CONTRATOR

SPECIFICATIONS OF ELECTRICAL ITEMS

POINT WIRING (LIGHT, BELL, FAN & PLUG)

The point wiring shall be confirm IS : 5908 - 1970. A point shall consist of the branch wiring from the branch distribution board (switch board) together with a switch as required, as far as and including the ceiling rose or socket-outlet or suitable termination. A three-pin socket-outlet point shall include, in addition, the connecting wire or cable from the earth pin to the earth stud of the branch distribution board.

The installation shall generally be carried out in conformity with the requirements of the Indian Electricity Act, 1910, as amended upto date and the Indian Electricity Rules, 1956.

The point wiring shall be carried out in the under mentioned manner:

(a) Supply, installation, fixing of conduits with necessary accessories, junction /inspection/ switch/outlet boxes.
(b) Supplying and drawing of wires of required size including insulated earth continuity wire.
(c) Supply, installation and connection of flush type switches, sockets, cover plates, switch plates fan regulators etc. as specified.
(d) The point shall be complete with branch wiring from the first switch board to the outlet point through other loop. Switch boards if necessary in a circuit, conduit with accessories, junction, inspection boxes, control switch, socket outlet boxes, ceiling roses, connector etc.
(e) For Concealed type electric point wiring the Groove/Zary should be done by using Stone Cutter Machine.

Unless otherwise mentioned, the system of wiring shall consist of single core 650/1100 volt grade PVC insulated wire with Aluminium/copper conductor laid through exposed surface mounted/concealed in wall and ceiling rigid PVC pipe/rigid steel conduits/PVC oval conduit/PVC casing-N-Capping/trunking/FIA approved PVC pipe etc. as specified.

The rigid PVC pipe/rigid steel conduits/PVC oval conduit/PVC casing-N-Capping/trunking/FIA approved PVC pipe shall confirm to IS:9537/I.S.S. with minimum wall thickness of 1.5mm. The corresponding accessories shall confirm to IS:3419. The minimum diameter of pipe shall be 20mm.

The steel conduit and accessories shall confirm to IS:1653-1964 and IS:3837-1966 as amended up-to-date, respectively.

The PVC trunking (PVC casing-N-Capping) shall be with double locking arrangement with grooves of size not below 1.5mm. in height confirm BS:4678 Part-4 of 1982 and with accessories of PVC/Resin polypropylene not below 1.8mm. thick duly sealed at joints.

The wiring shall be as per colour code viz. Red for R phase, Y ellow for Y phase, Blue for B phase, Black for neutral, Green for earth, Grey for control, white for bell point and all off wires shall be same as phase wire. The wiring shall be done in a looping manner. All looping shall be made only in switch boards.

The switches and socket outlets shall be shockproof flush type either tissino type/Modular type/molded plate type with silver-coated contacts with ISI Marked IS:3854.

The Conduit run on surfaces shall be supported on metallic 1.2mm. thick saddles/heavy duty PVC saddles which in turn shall securely screwed to wall or ceiling. Saddles shall be at intervals of not more than 500mm. Fixing screws shall be with round or cheese head and of rust-proof materials. No cross-over of conduits shall be allowed. Unless it is unavoidable. The entire conduit installation shall be clean and neat in appearance.

The Conduits embedded into the walls shall be fixed by means of staples at intervals of not more than 500mm. Chases in the walls shall be neatly made with electrically operated masonry wall cutter and shall

be refilled after laying the conduit with suitable mortar and brought to the finish of the wall. Conduit buried in concrete structure shall be put in position and securely fastened to the reinforcement. Proper care shall be taken to ensure that the conduits are neither dislocated nor choked out at the time of pouring concrete necessary fish wire shall be drawn in all conduit run.

The all materials and accessories used shall confirm to Indian Standard Specification. All types of wiring shall be capable of easy inspection. The open (unconcealed) wiring shall run along with walls should run as near the ceiling as possible. All runs of wiring and the exact positions of all points and switch boards shall be first marked on the building and got approved from the in charge electrical engineer before actual commencement of work.

The conduit for point wiring shall have a nominal cross-sectional area not less then either 1.00 mm2 copper or 1.5mm2 aluminium as specified. For open type switch boards shall not be erected within 2.5 meter of any washing unit or in bathrooms lavatories on toilets or kitchens. The switch block shall be PWD type with best valsadi seasoned teak wood or other durable wood with solid back thoroughly protected both inside and outside with good insulating varnish shall be provided. There shall be a clear distance of not less than 25mm between the teak wood board and cover. All the joints of board shall be dovetailed. The wooden block shall be covered with 3 mm thick laminated sheet firmly screwed on four corners with the help of chrome plated counter shunt round headed steel screws. For large size switch boards laminated sheet shall be screwed at six plates. Where so specified, the switchboards shall be recessed in the wall for concealed type wiring. The front shall be fitted with 3 mm thick laminated sheet. Ample room shall be provided at the back for connection and at the front between the accessories mountings. The concealed base shall be of either 16 gauge M.S. or teak wood as specified or instructed.

The Maximum load of each circuit shall not exceed 800 watts and maximum points of each circuit shall not exceed 10 points. Where wiring passes through wall, care shall be taken to see that wire pass very freely through protective pipe [rigid steel conduit / rigid PVC pipe / porcelain tube] and that the wires pass through without any twist or cross in wires, or either ends of holes.

The general and technical specification given in the tender booklet shall also be considered as a part of agreement. All the wiring materials shall be of approved make as specified in the tender booklet or as approved by in-charge Electrical Engineer.

TELEPHONE PLUG SOCKET

The Telephone plug & socket shall confirm Indian Standard Specification or IS:1293: The telephone socket outlet shall be two points type. The dimension of socket and plug shall have silver coated pins & pin seating of exact dimensions. so that pin of plug shall firmly fitted to seat in socket & no loose contact may arise. The connections to socket with telephone cable shall be made by tinned / silvered soldering. The socket shall be of flush mounted tissino type / moulded plate type / modular type as specified.

The telephone socket shall be erected on seasoned teak wood block or on concealed box covered with 3mm thick laminated sheet. The general specification give in tender booklet shall also be considered as a past of agreement. The telephone plug & socket shall be of approved make as specified in the tender booklet or approved by in-charge electrical engineer.

RIGID PVC PIPE/FIA APPROVED PVC PIPE:

The Rigid PVC/FIA Approved PVC pipe shall confirm IS:2509 or ISI marked a specified Rigid PVC pipe shall be 1.5 mm to 1.6 mm. thick manufactured from high grade vergin PVC. The diameter of PVC pipe/FIA Approved shall be as per specified. Fittings for rigid PVC/FIA Approved pipe such as bends, elbows, nipples, couplings, reducers, plugs etc. shall be specifically designed and manufactured for their application. All fittings shall confirm to IS:3415.

The rigid PVC/FIA Approved pipe shall be erected on wall/ceiling with properly screwed heavy duty rigid PVC saddles at the intervals not more than 500mm. and pipes to pipes and pipes to fittings shall be fixed with adhesive solution. 16 gauge G.I. fish wire shall be erected with erection of pipe as a drawer wire. The installation of pipes shall be as per IS:4648, IS:732 and IS:1646.

The PVC pipe/FIA Approved shall erected concealed in wall/ceiling or for open execution as specified and as per instruction of in-charge-electrical engineer.

The general specifications given in the tender booklet shall also be considered as a part of agreement. The PVC pipe/FIA Approved and fittings shall be of approved make as specified in tender booklet or as approved by in-charge-electrical engineer.

For Concealed type electric point wiring the Groove/Zary should be done by using Stone Cutter Machine.

MAINS:

The Mains shall be with ISI Marked PVC insulated wire with aluminium / copper conductor as specified. The size of phase and neutral shall be same while the size of earth conductor shall be as specified in the item. The number and size of conductor shall be as specified in the item. All wires shall be single core multi-strand PVC insulated as per IS:634 and shall be 660 V/1100V. grade. All wires shall be as per colour code viz. Red for R phase, Yellow for Y phase, Blue for B phase, Black for neutral, Green for earth conductor.

The Necessary connections to control switchgear, MCB Dist. board, plug etc. shall be made firmly as per requirement and as instructed by in-charge-electrical engineer.

The general specifications given in the tender booklet shall also be considered as a part of agreement. The wires shall be of approved make as specified in the tender booklet or as approved by in-charge-electrical engineer.

TELEPHONE CABLE:

The unarmored cable of 0.6 mm thick tinned electrolytic grade copper conductor insulated and sheathed with PVC compound. The cable should confirm to BS 6746 with twisted pairs bunched together
In concertic layers. The telephone wiring should confirm to ITD S/WS
113 C/S/WS -114 CBC 7000 in existing pipe.

COMPUTER BOARD.

The computer board should be consisting of 1 No. 6A/16A
Universal plug switch combined with fuse and indicator, 4 Nos.
6A tissino switch & 4 Nos. 6A tissino type 5pin Plug. In single board erected on wooden / PVC/Metal Board with 3mm thick laminated sheet as directed.

DISTRIBUTION BOARDS

Distribution boards shall be fabricated from 18 gauge M.S. sheet or shall be readymade as specified in the make of material list. It shall be of double door type with hinged (lockable if required) door suitable for recessed mounting in wall. Distribution boards shall be powder coated with 7-tank process application.
The distribution boards shall be provided with phase barriers, wiring channels to accommodate wires and individual per phase neutral links. There shall be separate or individual earth link as per requirement. Proper arrangement shall be made for mounting of MCB's and other accessories.

Distribution boards shall meet with the requirements of IS 2675 and marking arrangement of bus bars shall be in accordance with I.S. standards.

Bus bars shall be suitable for the incoming switch rating and sized for a temperature rise of 35° C over the ambient. Each board shall have two separate earthing terminals. Circuit diagram indicating the load distribution shall be pasted on the inside of the DB as instructed. One earthing terminal for single phase and two terminals for 3 phase DB's shall be provided with an earth strip connecting the studs and the outgoing ECU earth bar.

The top and the bottom faces of the D.B. shall be provided for conduit entry of minimum 1" dia. The faces if asked shall be kept detachable.

All outgoing feeders shall terminate on a terminal strip which in turn is interconnected to the MCB/Fuse base by means of insulated single conductor copper wires as follows

Up to 15 A	2.5 sq.mm.	40 A	10 sq.mm.
25 A	4.0 sq.mm.	63 A	16 sq.mm.
32 A	6.0 sq.mm.		

Each DB shall have indicating lamps preferably neon type denoting power availability in the board after the switch indicating lamps shall be complete with fuses.

ELCB

The ELCBs shall be of approved make & should be conforming to IS:12640/1988 & BS:4293/1983 having sensitivity of 30 MA & breaking capacity of 10 KA & suitable for 240/415 V 40 Amp. rating ELCBs should have characteristics of quick acting & tripping with all advanced features & do not incorporate any electronic component. The wiring for connection shall be used of PVC copper wires of adequate capacity with proper size of lugs.

The ELCBs shall be erected on polished wooden board as per direction of Engineer in charge.
The general and technical specification given in the tender booklet shall also to be considered as a part of agreement. The ELCB shall be of approved make and category as specified or approved by in-charge-electrical engineer.

MINIATURE CIRCUIT BREAKER (MCB)

Miniature Circuit Breaker shall comply with IS-8828-1996/IEC898-1995. Miniature circuit breakers shall be quick make and break type for 240/415 VAC 50 Hz application with magnetic thermal release for over current and short circuit protection. The breaking capacity shall not be less than 10 KA at 415 VAC. MCB's shall be DIN mounted. The MCB shall be Current Limiting type (Class-3). MCBs shall be classified (B, C, D ref IS standard) as per their Tripping Characteristic curves defined by the manufacturer. The MCB shall have the minimum power loss (Watts) per pole defined as per the IS/IEC and the manufacturer shall publish the values.MCB shall ensure complete electrical isolation & downstream circuit or equipment when the MCB is switched OFF.

The housing shall be heat resistant and having high impact strength. The terminals shall be protected against finger contact to IP20 Degree of protection. All DP, TP, TPN and 4 Pole miniature circuit breakers shall have a common trip bar independent to the external operating handle.

MCB should be having an integrated label holder with dual side din rail locking facility. Incoming & Outgoing should have facility for termination of Busbar & Cable separately.
Cable termination facility should be up to 35 sq. mm.

BUSBAR CHAMBERS

The busbar shall be air insulated and made high quality, high conductivity, high strength copper and as per relevant IS code. The busbar shall be for three phases and neutral system with separate neutral and earth bar. The busbar and interconnection between busbar and various components shall be of high conductivity, hard drawn, electrolytic copper. The busbar shall be of rectangular cross section designed to withstand full load current for phase busbar and full rated current for neutral busbar and shall be extensible type on either side. The busbar shall be rated for the frame size of the main incoming breaker. The busbar shall have uniform cross section through out the length. Ratio of 1 sqmm = 1.2 A shall be adopted for tinned copper busbars.

The busbar and interconnection shall be insulated with heat shrinkable PVC sleeves and be colour coded in red, Yellow, Blue, and Black to identify the three phases and neutral of the system. The busbar shall be supported on unbreakable, non hygroscopic DMC insulated supports at sufficiently close interval to prevent busbar sag and shall effectively withstand electromagnetic stresses in the event of short circuit capacity of 50 KA RMS symmetrical for one second and a peak short circuit withstand of 105 KA minimum.

The busbar shall be housed in a separate compartment. The busbar shall be isolated with 3 mm thick FRC sheet to avoid any accidental contact. The busbar shall be arranged such that minimum clearances between the busbar are maintained as per below.

Between phases	:	27 mm min.
Between phases and neutral	:	25 mm min.
Between phases and earth	:	25 mm min.
Between neutral and earth	:	23 mm min.

All busbar connection shall be done by drilling holes in busbars and connecting by chromium plated bolt and nuts. Additional cross section of busbar shall be provided in all PCCs / MCCs / PDBs to cover-up the holes drilled in the busbars. Spring and flat washers shall be used for tightening the bolts.

All connection between busbar and circuit breaker / switches and between circuit breaker/ switches and cable terminals shall be through solid copper strips of proper size to carry full rated current. These strips shall be insulated with insulating strips.

M.C.C.B.

The MCCB shall be air break type and having quick make quick break with trip free operating mechanism.

Housing of the MCCB shall be of heat resistant and flame retardant insulating material.

Operating handle of the MCCB shall be in front and clearly indicate ON / OFF / TRIP positions.

The electrical contact of the circuit breaker shall be of high conducting non-deteriorating silver alloy contacts.

The MCCB shall be provided with microprocessor based trip units. All the releases shall operate on common trip busbar so that in case of operation of any one of the releases in any of the three phases, it will cut off all the three phases and thereby single phasing of the system is avoided.

The MCCB whenever called for in the drawings shall provide an earth fault relay.

The MCCB shall provide two sets of extra auxiliary contacts with connections for additional controls at future date.

DANGER NOTICE BOARD:

The danger notice board shall be as per IS:2557 Danger notice plates. The danger notice board shall indicate danger notice both Hindi and English and with a sign of skull and bone. Overall dimension of the board shall be 200mm. wide 150mm. high, 1.5mm. minimum thickness prepared from M.S. steel sheet. The plate shall be painted white with vitreous enameled paint on both front and rear surface of the plate. The letter, the figure, the conventional skull, and bone shall be in signal red colour as per IS:5/1978 and shall be positioned on the plate as per IS:2551 - 1982. The danger plate shall have rounded corners. The danger notice board shall be affixed in a permanent manner with screwing with the help of chrome plate screws on four corners at the place and height as per instruction of in-charge-electrical engineer. The general specifications given in the tender booklet shall also be considered as a part of agreement.

CEILING FAN WITH REGULATOR:

The Ceiling Fans shall conform Indian Standard Specification IS : 374-1979. The enclosure of motors of Ceiling Fans shall be of the totally enclosed type. The enclose of regulators shall be ventilated type. The stamping of fan motors shall be made from electrical steel sheet. The Ceiling Fans shall have three numbers well balanced blades made from metal or other suitable material. The blades and motors shall be secrely fixed so that they do not lossen in operation.

The size of Ceiling Fans shall be as specified. The Ceiling Fans shall be suitable for operation on electric A.C. single phase 230 volt, 50 Hz power supply. Proper type of lubrication bearings shall be used to ensure a reasonable amount of silent operation.

The earthing terminal shall be provided on the suspension system. The live parts shall not be accessible in the assembled fan and regulator. capacitor of the fan shall conform IS:1709-1960. The suspension system shall be either bolted or screwed at the motor end and the suspension system shall be either bolted or screwed at the motor end and the suspension end. The suspension system of the Ceiling Fans shall be of adequate strength to withstand a tensile load of 1000 Kg without breakage and a torsion load of 500 Kg without breakage current carrying parts and other metal parts shall be corrosion resistant under normal conditions. The terminals shall be prepared from stainless steel or other corrosion resistant alloys. Radio and television interference suppressots shall be fitted.

The Regulators shall be capable of reducing the speed of the fan at least 50 percent of the full speed. The regulators shall be provided with an off portion and minimum five running positions excepts in case of continuously variable electronic type speed regulators. The regulator handle or knob shall either be of insulating material or adequately electrically and thermally insulated metal. The mechanism of the regulator shall be so designed to ensure positive contact at each running position. The voltage drop across the electronic type regulators at the maximum speed position shall not exceed 2% of the service value at the test voltage and at full speed shall be as per I.S.S.

The Ceiling Fans shall relate to ISI marked twin twisted flexiable wire of size not less than 24/0.2mm.

The general technical specification given in the tender booklet shall also to be considered as a part of agreement. The cutouts shall be of approved make as specified of given category in tender booklet or as approved by in charge electrical engineer.

MS PIPE DOWN RODE:-

The MS pipe down rode of medium class should have nominal bore of 19/20mm for erection of ceiling fans complete with necessary painting as required and as directed. The flat 3 core flexible wire of size 24/0.2 should be necessarily erected as required and as directed on site.

CONCEALED FAN HOOK WITH M.S. BOX:

The dimensions M.S. box shall be 175 x 175 x 75 mm. The wall thickness of the box shall be 16 gauge 15 mm. dia. M.S. rod in the shape of 'U' with their vertical legs bent horizontally at the top at least 19mm. on either side and shall be inserted through M.S. box on both sides. At the time of erection, the two ends of M.S. rod shall be bound to the top reinforcement of the roof. Necessary knockout on both side in the center shall be made in M.S. box for entry of conduit in the box.

All the fan hook shall be so fabricated that the fans revolve steadily. The size of fan hook shall be of such that the hook shall be completely hide by the top canopy of the fanned and the fans revolve steadily and bushing in the top suspension.

The box shall be free from burns, fins, and internal roughness. During erection care shall be taken the outer surface of the box shall properly flush with the ceiling. There shall be full threaded holes on four corners of box for fixing screws.

LAMINATED SHEET COVER:

The laminated sheet shall be 2.5 mm. thick and erected to cover the fan hook or M.S. Box.

INDUSTRIAL EXCHAUST FAN:

The Industrial Exhaust fan shall conform Indian Standard Specification No. IS:2312-1991.
The exhaust fan shall be suitable for heavy duty with double ball bearing have a strong and robust motor with low power consumption and aerodynamic blades, low loss iron stampings.

The fan shall be suitable for operation on electric single phase A.C., 230 volt, 50 Hz power supply system. The enclosure of the fan motor shall be of the totally enclosed type. Stampings of fan motors shall be made from electrical steel sheet. The fan shall be fitted with two or more well balanced blades made from metal or other suitable materials. The blades and blade carriers shall be securely fixed so that they do not loosen in operation. Proper type of lubrication ball bearings shall be used to ensure a reasonable amount of silent operation. The means provided for securing the fan mounting or fan casing to a wall, partition or window shall be such as to provide a secure fixing without damage. The suitable size of capacitor complying IS: 1709-1960 shall be used.

The exhaust fan shall have mounted ring to give maximum volume under free air flow condition. The size in diameter air displacement capacity in m3/hour and speed of motor in rpm. and power consumption in watts shall be as specified.

The exhaust fan shall be erected in window or wall as per the instruction of in-charge electrical engineer.
The general and technical specification given in the tender booklet shall also be considered as a part of agreement. The exhaust fan shall be of approved make as per the category specified in the tender booklet or as approved by the in-charge electrical engineer.

LED INDDOR FITTING:

- The **supply voltage** or voltages assigned to the luminaire by the manufacturer.

- The **current** at the supply terminals when the luminaire has stabilized in normal use at the rated voltage and frequency.

- The number and rated wattage of the lamps. for which the luminaire is designed.

- The temperature assigned to a luminaire by the manufacturer to indicate the highest sustained temperature in which the luminaire may be operated under normal conditions.Symbol : **ta**.

- A ballast generally designed to be built into a luminaire but incapable of being mounted outside a luminaire without special precautions.
- Wiring generally inside the luminaire and delivered with it, which forms the connection between terminals for external wiring or supply cables and terminals of lampholders, switches and similar components.
- LED indoor fittings with LEDs of wattage **0.2 Watt to 0.5** Watt assembled on single MCPCB.
- Hhousing used as a heat sink shall be made of thick sheet Steel conforming to IS: 513/CRCA/ aluminium die cast powder coated and high U.V. & corrosion resistance with diffuser with company mark/name 160V to 270V, Power Factor more than 0.9, THD < 15%,
- CCT 3000 K to 6500K,
- Luminaire efficacy> 85 lumens/watt ,LED
- LED driver efficiency > 85 %
- (fitting required LM-79 & LM-80 Certificates)(NOTE: Below description have shown ranges of Wattage capacity of LED fittings.The Engineer incharge may select any wattage capacity between the ranges

LED OUTDOOR FITTING:

- The **supply voltage** or voltages assigned to the luminaire by the manufacturer.

- The **current** at the supply terminals when the luminaire has stabilized in normal use at the rated voltage and frequency.

- The number and rated wattage of the lamps. for which the luminaire is designed.

- The temperature assigned to a luminaire by the manufacturer to indicate the highest sustained temperature in which the luminaire may be operated under normal conditions.Symbol : **ta**.

- A ballast generally designed to be built into a luminaire but incapable of being mounted outside a luminaire without special precautions.

- Wiring generally inside the luminaire and delivered with it, which forms the connection between terminals for external wiring or supply cables and terminals of lampholders, switches and similar components.

- High power White LEDs wattage of 3 Watt and above assembled on single MCPCB, efficiency more than 130 lm/w and corrosion free High pressure die cast aluminum housing with smooth finish powder coated and heat sink extruded aluminium with diffuser and Polycarbonate optics/ lenses, with toughened glass with company mark/name engraved or embossed 160 to 270 V,Power Factor more than 0.95, THD < 10 %, CCT 3000 K to 5700K,Uniformity ratio >0.45, Luminaire efficacy> 100 lumens/watt . LED driver efficiency > 85 %.(fittings required LM-79 & LM-80 certificates)(NOTE: Below description have shown ranges of Wattage capacity of LED fittings.The Engineer incharge may select any wattage capacity between the ranges shown

XLPE PVC INSULATED CABLE 2, 3, 3½ & 4 core

The Scope of work shall cover supply, laying, connecting, testing, and commissioning of low and medium voltage power cabling.
All Cables shall be as per relevant Indian Standard with ISI Mark.
All cables shall be 1100 volt grade XLPE PVC insulated, PVC sheathed aluminium or copper conductor

with or without armouring as specified and with an outer pvc protective sheath heavy duty. Cables shall have high conductivity stranded aluminium or copper conductors and cores colour coded to the Indian Standard. Type designation and core identification of cables shall be as per relevant Indian Standard.

All cables shall be new without any kind of visible damage. The manufacturers name, insulating materials, conductor size, voltage class and IS mark shall be marked on the surface of the cable at every 600mm length.

The cable shall be supplied in single length i.e. without any intermediate joint. The cable ends shall be suitably sealed against entry of moisture, dust, water etc. with cable compound as per standard practice.

Cable shall be laid in the routes as directed by in charge Electrical Engineer.

Cable running indoors shall be laid on walls or ceiling as per the site situation. Cables shall be fixed directly to wall or ceiling and supported with G.I. saddles / clamps at not more than 500 mm. interval with chrome plated screws.

In case of cables buried directly in ground, cables shall be laid in an excavated trench not less than 900 mm from G.L., over a sand or soft earth cushion to provide protection against abrasion.

In case cables entering the building or one room to another it would be done through porcelain / PVC pipes. After erection, the pipes shall be sealed with M-seal.

TRENCH.

The Trench for laying of cable should have width of 90cms. Deep. The trench should be so excavated for laying of cable 90cms below the ground all over the run and back filling the same and making the surface as normal ground.

DWC PIPE 50 MM:

- Double walled corrugated pipes (DWC) of polyethylene (conforming to IS 14930 II)
- Dimension OD 50mm & ID 38 mm,
- Min bending 700 & Id of coil 1400.
- Compression strength at 5% applied Defection load 2450N.
- While bent at a bending radius given In Dimension 95% of ID passes smothly at room temperature & -5 'C.
- Impect strength 5 kg Striker Falling through a height of 570 mm Energy -28 Joules.

RIGID PVC PIPE:

The ISI mark rigid PVC pipe of suitable size as specified in tender booklet should be erected at road crossing on floor and on wall as directed for laying of cable. The pipes of suitable size of dia as specified in tender should have specified weight per 6 Mtr. As mentioned for suitable class.

BRASS CABLE GLAND & LUG:

Cable terminations shall be made with aluminium crimped type solder less lugs for all aluminium cables and stud type terminals. For copper cables copper crimped solder less, lugs shall be used.

Crimping shall be done with the help of hydraulically operated crimping tool.
For joints whereby cable is with aluminium conductor and busbars are aluminium, bimetallic lugs shall be used with compound. CUPAL type of washers shall be used.
Crimping tool shall be used for crimping any size of cable.

DMC BOX & Bakelite connector:

Streetlight / wall mounting junction box compression molded from DMC (thermoset plastic) vertical sliding cover having locking with square head stud loop in / loop out in built terminal suitable for four core cable, waterproof of I.P. 54 protected with clamp or bolt nut & earth bolt of following size

1) 400 mm x 300 mm x 190 mm
2) 140 mm x 140 mm x 95 mm
3) 103 mm x 103 mm x 73 mm

EARTHING:

earth pit of minimum bore dia.150mm size approved make Earthing Electrode consisting Pipe-in-Pipe Technology as per IS 3043-1987 made of corrosion free G.I.Pipes having Outer pipe dia of 50mm having 80-200 Micron galvanising, Inner pipe dia of 25 mm having 200-250 Micron galvanising, connection terminal dia of 12mm with constant ohmic value surrounded by highly conductive compound with high charge dissipation suitable for following type of applications.(a) For Electrical Installation up to 440V in normal soil.

BARE COPPER WIRE:

The bare copper wire of 8 to 16 SWG should be annealed & erected for earthing purpose as directed and as required confirming to IS specification.

WATER COOLER-80 TO 150 LITRES CAPACITY:

The water cooler shall be with hermetic sealed type suction cooled compressor with overload protection confirming to IS:10627 (Part-1) 1983.

The water tank of cooler shall be fabricated from S.S. sheet of 0.8mm. minimum thickness as per IS:304 and shall be made by electrically seam welded lap joints. Water tank cover and lid bottom shall be made of 1.25mm. aluminium sheet duly anodized/epoxy painted high impact polystyrene (HIP) of 1.5mm. thickness. Double locking of the lid shall be provided.

The cabinet of the water cooler shall be made of M.S. Sheet of 1.0m. thick. The drain pan of water cooler shall be made of stainless-steel sheet of 0.63mm. The drain shall be 'CSR' or 'PSC'. Water cooler shall be installed as per the instruction of in-charge-electrical engineer. Necessary plumbing connection to inlet and outlet of water cooler by using necessary G.I. pipe and fittings, PVC heavy duty connection pipes with male and female screwed nipples etc. shall be done and made waterproof without any leakage.

The general specification given in the tender booklet shall also be considered as a part of agreement. The Water cooler shall be of approved make as specified in the tender booklet.

WATER FILTER CUM PURIFIER:

5 stage single reverse osmosis water purification system with M.S. powder coated frame, prefilter housing with 'O' ring presediment filter GAC filter, carbon filter suitable buster DC pump capacity 80 psi, mention with 40 psi inline type post carbon filter auto low & high pressure switches with following size of storage tank & LPH capacity & erected as directed

CABLE TRAYS:

Cable trays shall be fabricated from Hot Dip GI and channels of 14 gauge and shall be powder coated with 7 tank process if specified. The design shall be ladder type with optional cover. Shall be fixed or suspended from the ceiling with the help of suspenders which shall have adequate diameter to sustain the weight of the cables and channels. Also, if necessary anchor fasteners shall be used for grouting purpose.

The cable shall be laid side by side in trench with brick covering on all the three sides. The trench shall be such that sharp bends shall be avoided while laying the cable. The bedding of fine sand under the cable shall be not less than 6 mm. The trench shall be terminated in Manholes with specified size of R.C.C. hume

pipes as shown in drawing. Cable markers shall be provided throughout the route of cable at 10 mtrs distance. The trenches shall be refilled after the cable are laid and the Ground level shall be done as per original after pressing the same. The cables shall be checked for insulation resistance and continuity tests shall be carried out.

VARIOUS CODES FOR ELECTRICAL WORKS

Sr. No.	IS No.		Description
1)	IS: 2026-1977 1981 -1994	:	Distributing transformers & fittings.
2)	IS 3639-1966	:	Fittings and acc. For P.T.
3)	IS10028-Part III 1981	:	Installation of Transformer.
4)	IS: 13118-1991	:	Specification for AC circuit breakers.
5)	IS: 335-1993	:	Insulating oil for Transformers & switch gear.
6)	IS: 2705-1992	:	CT for measuring and protection.
7)	IS: 3155-1992	:	Voltage (Potential) Transformers.
8)	IS: 3155-1992	:	Voltage Transformer.
9)	IS:8623 -Part II 1993	:	Bus-bar arrangement and marking.
10)	IS:2099 -1986	:	Bushing
11)	IS:5621 -1980	:	Large Hollow Porcelains Insulator
12)	IS:2544 -1973	:	Insulators
13)	IS:2629-1985 IS:2633-1986	:	Hot Dip Galvanizing
14)	IS: 3842-1967	:	Relays.
15)	IS: 1248-2003	:	Meters (measuring).
16)	IS: 10118-1982	:	Installation of Switch gears.
17)	IS: 692-1994	:	HV cable.
18)	IS: 1255 -1983	:	Installation of HV cables and jointing.
19)	IS: 3043-1987	:	Code of practice for earthing.
20)	IS:13947-Part III -1993	:	HD Air breaker, Switch gears and fuses voltage not exceeding 1000 Volts.
21)	IS:13703-Part IV -1993	:	Selection, installation and maintenance of fuses up to 650 Volts.
22)	IS:13947-Part I -1993	:	General requirements for switch gear and control gear for voltage not exceeding 1000 Volts.
23)	IS: 13947-Part III -1993	:	Air-break isolators for Voltage not exceeding 1000 Volts.
24)	IS:8623-1993 gears for Volts	:	Factory built assemblies of switch gears and control voltage up to and including 1000 Volts A.C. and 1200 D.C.
25)	IS:11353-1985 main	:	Marking and arrangement of switch gear bus bars connectors and auxiliary wiring.
26)	IS: 2147-1962	:	Cubical Boards.
27)	IS: 8084-1976	:	Insulated conductor rating.
28)	IS: 2675-1983	:	Enclosed distribution fuse boards and cutouts for

	Voltage not		exceeding 1000 Volts.
29)	IS: 8828-1995	:	Miniature Circuit Breaker.
30)	IS: 9926-1981	:	Fuse wire used in rewirable type electric fuses up to 650 Volts.
31)	IS: 1554-Part I -1998	:	PVC insulated electric cables Heavy duty.
32)	IS: 3961-Part II 1967	:	Recommended current rating for cables.
33)	IS: 8130-1984	:	Copper conductor in insulated cables and cores.
34)	IS: 8130-1984	:	Conductor for insulated electric cables and flexible cords.
35)	IS: 3975-1999	:	Mild steel wires, strips and tapes for armoring cables.
36)	IS: 5831-1984	:	PVC insulation and sheath of electric cables.
37)	IS: 8130-1984	:	Aluminum conductor for insulated cables.
38)	IS: 11955-1987	:	Recommended current rating for Cable.
39)	IS: 732-1989	:	Code of practice for electrical wiring installation system Voltage not exceeding 650 Volts.
40)	IS: 1646-1997	:	Code of practice for fire safety of Buildings (general) electricalinstallation.
41)	IS: 9537-1981	:	Rigid steel conduits for electrical wiring.
42)	IS: 2667-1988	:	Fittings for rigid steel conduits for electrical wiring.
43)	IS: 3480-1966	:	Flexible steel conduit for electrical wiring.
44)	IS: 3837-1976	:	Accessories for rigid steel conduits for electrical wiring.
45)	IS: 694-1990	:	PVC insulated cables (wires).
46)	IS: 9537-Part III -1983	:	Rigid non-metallic conduits for electrical wiring.
47)	IS: 6946-1973	:	Flexible (playable) nonmetallic conduits for electrical installation.
48)	IS: 1293-2005	:	Three pin plugs and sockets.
49)	IS: 8130-1984	:	Conductors for insulated electrical cables and flexible codes.
50)	IS: 9537-1980	:	Specification for conduit for electrical installation.
51)	IS: 3419-1988	:	Accessories for non-metallic conduits for electrical wiring.
52)	IS: 3854-1997	:	Switches.
53)	IS: 6538-1971	:	Plugs.
54)	IS: 13925-Part I -1998	:	Shunt Capacitors for power systems.
55)	IS: 9385-1979	:	HRC cartridge fuse and links up to 660 volts.
56)	IS: 1913-1978	:	General and safety requirement for lighting fittings.
57)	IS: 1944-1981	:	Code of practice for lighting public thorough fares.
58)	IS: 3528-1966	:	Waterproof electric lighting fittings.
59)	IS: 3553-1966	:	Water tight electric lighting fitting.
60)	IS: 1239-Part I -2004	:	Mild Steel tubular and other wrought steel pipe fitting.
61)	IS: 10322-Part V -1987	:	Luminaries for street light.
62)	IS: 93703-Part III -1993	:	HRC fuses having rupturing capacity of 90 KA.
63)	IS: 2312-1967	:	Exhaust Fan.

64)	IS: 374-1979	:	Class I Ceiling Fan.
65)	IS: 7098 (Part I, II, III) -1985&86	:	XLPE armoured Cables.
67)	IS:7098 (Part I&II)	:	XLPE armoured Cables.

NOTE : All codes and standards means the latest where not specified otherwise the installation shall generally follow the Indian Standard codes of practice or relevant British Standard Codes of Practice in the absence of corresponding Indian Standards.

ALSO FOLLOW :

a. Indian Electricity Act and rules issued thereunder revised upto date.

LIST OF MATERIALS OF APPROVED BRAND /MANUFACTURE
(ELECTRICAL WORKS)

1	**Modular accessories**	Havells, Anchor , Legrand , Schneider, C&S, Indoasian,
2	**R.C.C. Pipes**	Indian Hume Pipe Co., Alcock Cement Products,Patel Spun.
4	**Rigid PVC pipe (LMS, MMS, HMS)**	Precision, Anchor, Polycab, BLP, Vraj Plastic, Nihir
5	**Mains & Wires (FRLS)**	Finolex, Anchor, Havells, R.R. Kabel, Polycab, Darshan plus.
6	**TV Cable**	Finolex, Anchor, Havells, R.R. Cable
7	**Telephone cable**	Delton, Finolex, Anchor, Havells, R.R. Cable,
8	**Cat- 6 Wire**	Finolex, D-Link , Molex
9	**MCB & DB**	C&S, Siemens, L&T, Legrand, Anchor, Indoasian, HPL, Schneider
10	**ELCB ƒ RCCB**	C&S, Siemens, L&T, Legrand, Anchor, Indoasian, HPL,, Schneider
11	**Metal Clad Switch (ICDP, ICTP)**	AEW, PEW, SUPER, KEW, NILANG
12	**MCCB**	C&S, Siemens, L&T, Legrand, Indoasian, Schneider, HPL
13	**Change Over Switch**	C&S, Siemens, L&T, Legrand, Indoasian, Schneider, HPL
14	**Time Switch**	C&S, Siemens, L&T, Legrand, Indoasian, Schneider, HPL, GIC
15	**Current Transformer**	AE, Virat, Narmada, Kappa, Kalpa
16	**Power Terminal**	Connect well, Reputed
17	**Indication Lamp**	LED Type : Schneider, L&T, RASS
18	**Voltage/ Ameter Selector Switch**	L&T, Salzer
19	**XLPE Cables (Al. & Cu)**	Torrent, Havells, RR Kable, Finolex, , Polycab, KEI,
20	**Glands**	Compression type, Heavy duty and deep threading with rubber-ring and double washers. (Sample to be approved)
21	**Ceiling Fan**	USHA, Crompton, Bajaj, Orient, Havells
22	**Exhaust Fans**	USHA, Crompton, Bajaj, Orient, Havells, Almonard, Indoasian,
23	**LED Street Light**	Havell's, Philips, Panasonic, Wipro, or equivalent **(As suggested by Client/ Architect -Sample to be approved)**
24	**LED Indoor Light**	Havell's, Philips, Panasonic, Wipro, or equivalent **(As suggested by Client/ Architect -Sample to be approved)**
27	**LED Outdoor Light**	Philps, Lightberry, Optra, Wipro, K-lite, Rangelite, Prisha, Nirvana or equivalent**(As suggested by Client/ Architect -Sample to be approved)**
28	**SMC BOX For St. Lgt.**	Sintex, ESCO, EPP
29	**DG Set**	Engine: Cummins, Greaves, Kirloskar, Caterpillar Alternator: Crompton, KEC, Stamphord, Mahindra
30	**Lift (Premium. Category)**	OTIS, Mitsubishi, Schindler, Johnson, Orbis, Omega
31	**Aviation Light**	Alpha−Lite, Avaids Technovators Pvt Ltd.,Bajaj

32	**Fibre reinforced R.C.C. Manhole Cover**	Syntex, Pratibha, CIDCO, approved brand
33	**C.I. Manhole cover with frame**	ISI approved make
34	**Motor Pump Starters**	C&S, L&T, Siemens, Havells, GE
35	**Busbar Chamber**	C&S, Siemens, L & T ,GE, Havells, Super
36	**DWC Pipe**	Rex, Gemini, Duraline, Nihir, Astral
37	**HDPE PIPE**	Dutron, or equivalent
38	**Street Light Pole**	Transrail, Bajaj, Valmont, Utkarsh, Ambica,
39	**Decorative Pole**	Lightric Studio (NIV) , K-lite , Equivalent, (As suggested by Client/ Architect -Sample to be approved)
40	**FRP Pole**	Creative Composite, Sumip composites
41	**Earthing & It's Accessories**	E−Link, Green Wire, Ashlok, Electro Earth, YANSI, LPI, RAPID
42	**Water Supply Pump Set**	Kirlosker, Crompton, Lubi, Amit
43	**PANLE MANUFACUTRE**	CPRI APPROVED
44	**STABILIZER**	POWER ELECTRICAL, PARTH CORPORATION, SERVO STABILIZER
45	**Cable Lugs**	Dowells, 3-D, Raychem.
46	**Fire Extinguisher**	Should be of ISI approved - Safex,Firex,Safeline
47	**PA System /Amplifier**	Bosch, Honywell, JBL, Equivalent, **(As suggested by Client/ Architect - Sample to be approved)**
48	**Speaker**	JBL, Bose, Electro Voice, Bosch, Honywell Or Equivalent, **(As suggested by Client/ Architect -Sample to be approved)**

Special Notes:

- **The MCB and MCB DBs must be of same make.**
- **The contractor shall submit the sample of each item / component of above mentioned approved make for the approval of the Client/Architect/Consultant.**
- **Make of components required to be used by contractor to complete the installation, if not mentioned anywhere, shall be required to GOT IT APPROVED by Client/Architect/Consultant before installation in writing manner.**

FIRE FIGHTING SYSTEM

CONTENT

A. SPECIAL CONDITIONS OF CONTRACT

1.0 GENERAL:

These special conditions are meant to amplify the specifications and General Conditions of Contract. If any discrepancy is noticed between General Conditions of contract, specification, Bill of Quantity and Drawings, the most stringent of the above shall apply.

The work shall be carried out in the accordance with the drawings and design as would be issued to the Contractor by the Design Consultant duly signed and stamped by him. The Contractor shall not take cognizance of any drawings, designs, specifications etc. not bearing Design Consultant signature and stamp. Similarly the Contractor shall not take cognizance of instructions given by any other Authority except the instructions given by the Client's Representative/ Consultant in writing.

The scope of this section is to describe materials and systems for fire fighting installations within the building which form together with the project documents, a complete volume of work and quality description.

All fire fighting installations shall be of high quality, safe, complete and fully operational including all necessary items and accessories whether or not specified in details. All fire fighting works shall be completed in accordance with the regulations and standard to the specification OWNER, the general provisions, special provisions and general requirements apply to all items of this specification.

The work shall be carried out simultaneously with building work, civil work, etc. and shall be continued till it is completed satisfactorily along with the completion of essential portions of the building works.
The work shall be executed and measured as per metric dimensions given in the Bill of Quantities, drawings etc.

The Contractor shall acquaint himself fully with the partial provisions for supports that may be available in the structure and utilize them to the extent possible. In any case the Contractor shall provide all the supports regardless of provisions that they have been already made. Nothing extra shall be payable for situations where insert plates (for supports) are not available or are not useful.

Shop coats of paint that may be damaged during shipment or erection shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with paint to match the finish over the adjoining shop painted surface.

The Contractor shall protect / handle the material carefully and if any damage occur while handling by the Contractor then the sole responsibility shall be of the Contractor. Such damages shall be rectified/recovered by the Contractor at no extra cost whatsoever.

During the progress of work, completed portion of the building may be occupied and be put to use by OWNER but the contractor will remain fully responsible for the maintenance of Fire Protection System installations till the entire work covered by this contract is satisfactorily completed by him and handed over to OWNER.

2.0 ACCOMPANIMENT TO TENDER:

The tendered will attach to the Tender, at the time of submission, a statement containing information on the following points on separate pro forma.

List of all the confirmation of materials to be used as per specification along with manufacturer's name, catalogue and other technical details. Any deviation from the specifications shall be separately pointed out.

3.0 INTENT:

It is the intention of the specification and drawings to call for finished work, tested and ready for operation, whenever the words “Supply” or “Provide” are used. It shall mean delivery of material as specified in an assembled manner, ready for installation. Any apparatus, material or work not shown on drawings but mentioned in the specification or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be furnished, delivered and installed by the contractor without additional expenses to OWNER. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work and in the contract.

4.0 INTERPRETATION OF PROJECT DOCUMENTS:

The Specification, Drawings, and Bill of quantity shall be interpreted in accordance with good installation practice defined in the appropriate regulations and standards whether specifically referred to or not. If there is any discrepancy or shortfall in the application of the regulations to any aspect of this contract or the contractor considers there is anything detrimental to the standards or inconsistent with his obligations and guarantees, OWNER shall be informed prior to signing the contract and shall thereafter inform the contractor in writing the course to be followed. Where the drawings are to a small scale or are expressed in symbolic terms or are in the form of a diagram, then exact location of items shall not be inferred and in all cases, the work shall be fully integrated with the work of other trades and with the fabric of the building. The contractor shall appraise the duties of all plants and equipments taking account of any additions or variations and shall inform the OWNER of any matters which may affect the design. In all cases the equipment installed shall be of appropriate rating for the duty it performs.

The Specifications and Bill of quantity shall be considered as part of this contract and any work or material shown on BOQ and not called for in the specification or vice versa, shall be executed as if specifically called for in both. The Drawings indicate the extent and general arrangement of the Fire Pumps, Fire Hydrants & Sprinkler system layout etc. and are essentially diagrammatic.

The work shall be installed as indicated on the drawings, however, any minor changes found essential to coordinate the installations of this work with other services shall be made without any additional cost to the owner. The drawings are for the guidance of the contractor, exact locations, distances and levels will be governed by the building. The contractor shall examine all structural and Fire Protection system drawings before starting the work, and report to OWNER or its representative, any discrepancies which in his opinion appear on them, and get them clarified.

5.0 SCOPE OF WORK:

The work to be carried out under this contract comprises of the Fire Fighting work for the proposed project called for in the documents. The work covered under this contract comprises of supply (wherever called for), installation, connection, testing and commissioning the Fire Fighting work commencing from point of fire brigade inlet or fire water storage within the project/site as per specifications, relevant to TAC, NFPA, NBC, Indian standards, Local Fire Rules and Code of practice.

The contractor shall carry out and complete the said work under this contract in every respect and in conformity with the current rules and regulations of the local Fire Authority, the Indian Standards and with the directions of and to the satisfaction of the Consultant and Owner. The Contractor shall

furnish all labour and install all materials, appliances, equipment (except those items which will be supplied by the Owner to the contractor at site), necessary for complete provision and testing of the whole fire fighting installation as specified herein and shown on the drawings. This also includes any material, appliances, equipment not specifically mentioned herein or noted on the drawing as being furnished or installed but which are necessary and customary to make complete installation and to make the fire fighting system shown in the schedule or described herein, properly connected and in working order.

The work shall include all incidental jobs connected with Fire Fighting installation such as foundation block for pump-motor sets, excavation for pipe trenches and back filling, cutting/drilling holes through walls/floors and grouting, fixing of sprinklers with necessary civil work , supports & hangers for hydrant / pipes, etc.

In general, the work to be performed under this contract shall comprise of supply, installation, testing & commissioning of the following work but limited to followings:-

Wet Riser, Yard Hydrant & Accessories
Hose Reel, Portable Fire Extinguisher, Signages
Sprinkler System
Fire Pumps,U.G Tank & OHT
System Pipes with all fittings,Flanges, Orifice Plates, valves, Hangers, Supports.

All qualities mentioned in the Bill of quantity are approximate and the contractor shall not be eligible for any claim due to any variation in / or omission of any item.

Any extra item shall be calculated on the rate analysis basis approved by OWNER.

It is the responsibility of the contractor to co-ordinate with Local Fire Authority, Fire Officer and fulfils all the documents, drawings & any other requirement of them at no extra cost.

6.0 MODE OF MEASUREMENTS:

M.S. pipes shall be measured per linear meter of the finished length and shall include all fittings, welding, jointing, clamps for fixing to walls or hangers, anchor fasteners and testing. Sluice valves, check valves, butterfly valves shall be measured by numbers and shall include all items necessary and required for mixing and as given in the Specifications/Bill of Quantities. Hydrant valves, hose cabinets, rubberized fabric linen fire hose pipes, First-aid fire Hose reels, S.S. branch pipes, sprinkler shall be measured by numbers and shall include all items necessary and required for fixing as given in the Specifications/Bill of Quantities. Suction and delivery headers shall be measured per linear meter of finished length and shall include all items as given in the Bill of Quantities. Painting shall be included in the rate of headers. Painting of pipes shall be included in the rate for pipes and no separate payment shall be made. No additional payment shall be admissible for cutting holes or chases in walls or floors, making connections to pumps, equipment and appliances.

7.0 MODE OF PAYMENT:

Advance against material up to 60% of actual value of materials shall be paid after necessary warranty of the same at site of work is done, in terms of quantity, quality, and purchase price of such material. Such advance amount shall be paid for pipes, all Valves, Hydrant valves, Pump set only.

Vender shall bring the material at site maximum one month in advance before the actual usage of the same for erection. If the material is brought earlier then specified above, the payment of such material shall not be made.

8.0 FEES, PERMITS AND TESTS:

The Contractor shall pay for any and all fees and obtain permits required for the fire fighting work. On completion of the work the contractor shall obtain and deliver to the OWNER, **NOC**, certificates of final inspection and approval by the local fire authority and the Fire inspector.

9.0 UTILITY SUPPLY:

It is the responsibility of the contractor to co-ordinate with various utility agencies, the exact location of such Hook-Up Point and mode of connection. Further the contractor shall co-ordinate with such utility agencies to provide necessary drawings, documents, get their approval, make the necessary arrangement for the payments and arrange the utilities supply at no extra cost.

10.0 ACTUAL ROUTE OF PIPE:

The locations of the Hydrant pipes are only indicative, therefore, the actual route may differ from the plans according to the details of the building construction and the conditions of executions of the installations.

The contractor shall supply and install at his expense all secondary materials and special fittings found necessary to overcome the interference and to supply the modifications on the route of pipe and fittings that are found necessary during the work, to the complete satisfaction of the owner's representative.

11.0 MATERIAL AND EQUIPMENT:

All material and equipment shall conform to the relevant standards and shall be of the approved make and design. The materials and equipment shall conform to relevant Indian Standards. The Contractor shall be responsible for the safe custody of all the materials and shall insure them against theft, damage by fire, earthquake etc. A list of items of materials and equipment, together with sample of each shall be submitted to the OWNER within 10 days of the award of the contract. Any item which is proposed as a substitute, shall be accompanied by all technical detail giving sizes, particulars of materials and the manufacturer's name and shall be submitted along with the tender or bid offer. At the time of the submission of proposed substitute the Contractor shall state the credit, if any due to the owner. In the event the substitution is approved, all changes and substitutions shall be requested in writing and approvals obtained in writing from OWNER. Owner's decision in the matter shall be final.

All materials of the same kind of service shall be identical and made by the same manufacturers. Any deviation to this rule shall be approved by the Consultant. Top priority shall be given to the products that have a permanent agent providing spare parts and maintenance facilities in the same city where the project is situated.

The make of fire equipments, components, accessories, etc. has been mentioned in the tender. In case if the make is not given for the equipment / component / accessories, the contractor shall get approval for sample of that particular equipment / component / accessories from the Client / Consultants before any procurement.

12.0 MANUFACTURERS:

Where manufacturers have furnished specific instructions relating to the materials used in this job, covering points not specifically mentioned in these documents, these instructions shall be followed in all cases.

Where manufacturer's names and/or catalogue numbers are given, this is an indication of the quality, standards and performance required.

When interfacing occurs, equipment shall be mutually compatible in all respects.

13.0 RATING:

Rating of all items shall be appropriate for the conditions on the particular site on which the items will be used. All the equipment shall be fit for continuous work under the worst conditions of site and shall be rated for the following ambient condition.

- Outdoor temperature 50° C.
- Corrosive and humid

14.0 INSPECTION AND TESTING:

OWNER'S representative reserves the right to request inspection and testing at manufacturer's works at all reasonable times during manufacture of items for this contract. Tests on site of completed works shall demonstrate, among other things:

That the equipment installed complies with specification in all particulars and is of the correct rating for the duty and site conditions.

That all items operate efficiently and quietly to meet the specified requirements.

That all circuits are correctly fused and protected and that protective devices are properly coordinated.
That all non-current carrying metal work is properly and safely grounded in accordance with the specifications.

The contractor shall provide all necessary instruments and labour for testing, shall make adequate records of test procedures and readings, shall repeat any tests requested by the OWNER and shall provide test certificates signed by a properly authorized person. Such test certificates shall cover all works.

If tests fail to demonstrate the satisfactory nature of the installation or any part thereof then no claims for the extra cost of modifications, replacements or re testing will be considered. Owner's decision as to what constitutes a satisfactory test shall be final.

The above general requirements as to testing shall be read in conjunction with any particular requirements specified elsewhere.

15.0 PRICE DETAILS:

At anytime and at the request of OWNER, the contract shall provide details or breakdown of costs and prices of any part or parts of the works.

16.0 TEST CERTIFICATES:

The contractor shall submit test certificates for all the material/system installed. These shall be issued by a government recognized inspection office certifying that all equipment, materials, construction and functions are in agreement with the requirements of these specifications, ISI and when ISI is not applicable other approved certifying agencies.

17.0 INSTRUCTION MANUAL:

The contractor shall prepare and produce instruction, operation and maintenance manuals in English for the use, operation and maintenance of the supplied equipment and installations, and submit 3 sets to OWNER, at the time of handing over.

18.0 SAMPLES AND CATALOGUES:

Before ordering the material necessary for this work, the contractor shall submit to OWNER for approval, a sample along with the catalogues.

For big items such as Pump, Prime Mover, Valves, Hydrants, Pipe, Sprinkler the submission of catalogues shall be enough. Prior to ordering any fire fighting equipment/material/system, the contractor shall submit to OWNER, the catalogues, along with the samples, at least from three different manufacturers. After the selection of manufacturer by OWNER, the contractor shall arrange inspection and testing at the manufacturer's factory or assembly shop for final approval. No material shall be procured prior to the approval of the OWNER.

19.0 VENDOR AND SHOP DRAWINGS:

The contractor shall prepare and submit to OWNER, for his approval, two sets of vendor detailed drawings of all distribution boards, switch boards, outlet boxes, special pull boxes, and other likewise material, equipment to be fabricated by the contractor, or other vendor within 15 days of signing of the contract.

Before starting the work, the contractor shall submit to OWNER for his approval in the prescribed manner, the shop/execution drawings for the entire installation, specially the main connections and junctions, the route of conduits and cables, no. and size of wires drawn through the conduits, location of all the outlet points, and switch boards and distribution boards and any other information required by OWNER. OWNER reserves the right to alter or modify these drawings if they are found to be insufficient or not complying with the established technical standards or if they do not offer the most satisfactory performance or accessibility for maintenance.

20.0 AS BUILT DRAWINGS:

At the completion of work and before issuance of certificate of virtual completion the contractor shall submit to OWNER, three sets of layout drawing drawn at appropriate scale indicating the complete Fire Protection system "as installed". These drawings must provide (in plan, elevation and section)
Location and details of Fire Pumps, Prime Movers and Panels,

Location of Wet Risers, Hose reel details, Fire Extinguisher, Signages & Sprinkler System.
Location of Fire Brigade inlets & Fire Storage Tank.

21.0 GUARANTEE:

At the close of the work and before issuance of final certificate of virtual completion by OWNER, the contractor shall furnish written guarantee indemnifying OWNER against defective materials and workmanship for a period of one year after completion. The contractor shall hold himself fully responsible for reinstallation or replacement, free of cost to OWNER, the following:
Any defective work or material supplied by the contractor.

Any material or equipment supplied by OWNER which is damaged or destroyed as a result of defective workmanship by the contractor.

Any material or equipment damaged or destroyed as a result of defective workmanship by the contractor

22.0 SAFETY OF MATERIALS:

The contractor shall provide proper and adequate, storage facilities to protect all the materials and equipment including those issued by OWNER against damage from any cause whatsoever.

23.0 COMPLETION CERTIFICATE:

On completion of the Fire Protection System installation (or an extension to an installation) a certificate shall be furnished by the contractor countersigned by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local supply authority. The contractor shall be responsible for getting the **approval/NOC** by the local concerned authorities.

24.0 DEFECTS LIABILITY:

Defects liability period shall mean 12 calendar months after OWNER have issued certificate of completion of the whole work. The certificate of completion shall be issued after the necessary tests have been carried out to the satisfaction of OWNER and the required drawings are submitted.

The contractor shall make good at his own cost and to the satisfaction of OWNER, all defects or other faults arising in the opinion of OWNER out of bad workmanship or faulty materials not in accordance with the drawings, NBC or TAC and the Rules and Regulations under which it may appear within twelve months after completion of the work.

25.0 STAFF:

The contractor shall employ a competent fully licensed qualified, full time erection engineer to direct the work of erection in accordance with the drawings and specifications. The engineer shall be available all times at site to receive instructions from OWNER, in the day to day activities throughout the duration of contract. The engineer shall correlate the progress of the work in conjunction with all the relevant requirements of the supply authority.

26.0 REINSTATING AND FINISHING OF CIVIL DAMAGES:

For erection of equipment / cables etc., if any civil structure is required to be broken, the same shall be done, restated and finished as original by the tendered without any extra cost.

B. TECHNICAL SPECIFICATIONS

1.0 SCOPE OF WORK :

Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install Wet riser, Sprinkler, First Aid Fire Protection system as required for all floor as per the drawings and specified here in after or given in the Bill of Quantities.

Without restricting to the generality of the foregoing, the fire safety system shall include the following:-

a) M.S. piping, Wet riser, Yard Hydrant, Hose box & accessories
b) Hose reels, Fire Extinguishers etc.
c) Pump House & Accessories
d) Sprinkler System
e) Suction, Delivery & header pipe, fittings, flanges & valves.
f) Signages

2.0 PIPE WORK :

2.1 GENERAL REQUIREMENT:

All the materials shall be of ISI mark / TAC approved, best quality conforming to the specifications and subject to the approval of the Client or his representative. If so directed, materials shall be tested in an approved testing laboratory & the contractor shall produce the test certificate in original to the Engineer-in-charge & the entire charges for original as well as repeated tests shall be borne by the Contractor.

Before welding, the pipe faces shall be cleared & then shall be welded conforming to IS: 9595 – 1980. The electrodes used for welding shall comply with IS: 814. The laying of welded pipe shall also comply to IS 5822 – 1986. The welding joints shall be tested in accordance to IS: 3600, Part 1973.
Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workman like manner.

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

Pipes shall be securely fixed to walls and ceilings by **suitable clamps or supported at every 3 mtrs. & at change of direction as required**. Only approved type of anchor fasteners shall be used for RCC ceiling and walls.

Valve and other apparatus shall be so located that they are easily accessible for operations, repairs and maintenance.

2.1. PIPE AND FITTINGS:

All pipes shall be conforming to IS:1239-1990 (M.S. Heavy class) with screwed flanged or welded joints as specified by the Client's Representative.

Pipes (exposed) shall be given two primary coat of Zinc chromate with two coat of compatible epoxy paint give an even look (Fire red, shade No. 536 as per IS: 5).

All black steel pipes under floors or below ground shall be provided with protection against corrosion by application of 100/ 150 mm wide and 4mm thick layer of PYPKOTE/ MAKPOLYKOTE (IS:10221) over the

pipe, as per manufacturer's specifications Checking with holiday testing machine. Excavation of soft soil including backfilling, compacting, watering up to 1.3M depth.

Fittings for M.S. / G.I. pipes shall be approved type malleable iron (forged fittings) for tapered screwed joints. Fittings shall be approved type steel fittings conforming to IS:1239-1982 Part - II for screwed joints and welded.

All fittings such as bends, tees, etc. for 50mm below shall be standard forged fittings. Cast iron fittings and fabricated fittings shall not be accepted.

All piping laid shall be as follows:

Pipe Size	**Material**	**Joints & Fittings**	**Sealing Material**
Up to 50mm	E.R.W., M.S.Pipe Heavy Class IS:1239/1979	Screwed Fittings Unions Raised face Slip-on Flanges	Non-Hardening Lubricant 3mm, 3-ply Rubber insertion
75mm to 150mm	E.R.W., M.S. Pipe Heavy Class IS:1239/1979	Welded Fittings Raised face Slip-on Flanges	3mm, 3-ply Rubber insertion
200mm to 300mm	E.R.W. Welded Pipes (Minimum 6.35 mm Thk.) IS:3589/1981	Welded Raised face Slip-on Flanges	3mm, 3-ply Rubber insertion

Pipes shall be provided with electrical resistance welding. Jointing shall be butt welded between pipe and pipe and fittings.

Joints between C.I. and M.S./G.I. pipes shall be made by provided a suitable flanged tail or sockets piece and M.S. flanges on the M.S./G.I pipe shall have appropriate number of holes and shall be fastened with nuts, bolts and 1.5mm thick compressed asbestos gaskets.

Tee off connections shall be through reducing tees. Drilling and tapping of the main walls of the main pipe shall not be allowed.

All equipment and valve connections shall be through flanges (Welded or screwed for mild steel).

All welded piping is subjected to the approval of the Client's Representative and sufficient number of flanges and unions shall be provided.

Tender drawings indicate schematically the size and location of pipes. The Contractor on the award of the work, shall prepare detailed working drawings, showing the cross-section, longitudinal sections, details of fittings, locations of isolating and control valves, drain valves and all pipe support, structural supports. He must keep in view the specific openings in buildings and other structures through which pipes are designed to pass. Drawings to be got approved from Local Fire Authorities.

Contractor shall submit the Hydraulic calculation for the system in accordance with Fire Authority By Laws.

Piping shall be properly supported on or suspended from stand clamps, hangers as specified and as required. The Contractor shall adequately design all the brackets, saddles, anchors, clamps and hangers, and be responsible for their structural sufficiency.

Pipe supports shall be of steel, adjustable for height and primer coated with rust preventive paint and finish coated back. Where pipe and clamps are of dissimilar materials a gasket shall be provided in between. Spacing of pipe supports shall not exceed the following:

Pipe Size	**Spacing between Supports**
Up to 65 mm Dia	3500 mm
65 to 100 mm Dia	4000 mm
100 to 250 mm	5000 mm

Vertical risers shall be parallel to walls and column lines and shall be straight and plumb. Risers passing from floor to floor shall be supported at each floor by clamps or collars steel structural supports attached to pipe and with a 15 mm thick rubber pad or any resilient material. Where pipes pass through the roof floor, suitable flashing shall be provided to prevent water leakage. Risers shall have a suitable clean out at the lowest point and air vent at the highest point. The Contractor shall coordinate with structural.

Pipe sleeves, 50 mm larger diameter than pipes, shall be provided wherever pipes pass through walls and slabs, and annular space filled with fire proof materials like putty, fire seal etc.

Piping work shall be carried out in a workmen like manner, causing minimum disturbance to the existing services, buildings, roads and structure. The entire piping work shall be organized in consultation and coordination with other agencies work so that particular area work shall be carried out in one stretch.

Piping layout shall take due care for expansion and contraction in pipes.

All pipes using screwed fittings shall be accurately cut to the required sizes and thread in accordance with IS:554 and burrs removed before lying. Wherever reducers are to be made, eccentric reducers shall be used.

3.0 HUME PIPE:

NP3 class R.C.C Hume pipe (IS-458) shall be provided at the road crossing. Hume pipes with mortise - tension jointed with cement and with RCC collar to cover and overlap the joints laid to correct below ground level.

4.0 VALVES:

4.1 GATE/SLUICE VALVES:

Sluice valves of sizes 50mm and above shall be cast iron double flanged solid wedge, inside screw, non rising stem, bolted bonnet Construction. The valves shall have renewable screwed body seat. Pressure rating shall be PN 1.6 and valve shall be as per IS: 14846.

4.2 CHECK VALVES (NON RETURN VALVE):

Check valves / Non Return valve shall normally be used in all water services. Check Valve / Non return valves shall be provided as required or as shown in the drawings and conform to the following specifications:

a) Type: Dual Plate
b) Body material: Cast iron
c) Standard : IS:5312 / API 594
d) Test Pressure: Body 24 Bar, Seat 16 Bar

4.3 BUTTERFLY VALVES:

All the isolation valve 50cm and above on the equipment and water lines, where specified or shown on drawings shall be wafer type butterfly valves. They shall be designed to fit without gaskets, the water tight seal being obtained by Nitrile seat projection at the faces compressed between the flanges. The valves shall be supplied inclusive of M.S. pipe flanges and high tensile steel bolts of dimensions recommended by suppliers of valves. The valves shall comply with following specification. It is provided as per following specifications:

a) Type: Wafer type
b) Pressure rating: PN 1.6
c) Body Material: Cast iron
d) Disc Material: Stainless steel
e) Seat material: Nitrile
f) Operation: hand Lever
g) Standard : IS:13095
h) Test Pressure: Body 24 Bar, Seat 18 Bar

4.4 AIR RELEASE VALVE:

Provide 25mm diameter screwed inlet ball type Gun metal air valve on all high points in the system for venting. Valve shall be of the single acting type, vulcanite balls, rubber seating etc.

4.5 INSTALLATION:

- Valve shall be installing in a manner that allows future removal and service of the valve.
- Packing and gasket shall not contain asbestos.
- The valve shall be of the same size as the pipe to which they are installing.
- Valve above 150mm diameter shall be self locking warm gear type water proof and protory lubricated.
- Provide chain operator's w/chain cleats on all valves more than 2.4 meter above floor.

5.0 HYDRANT VALVES:

Contractor shall provide on each landing and other locations as shown on the drawings one single headed Stainless Steel (S.S.) landing valve with 63mm dia, outlets and 80mm inlet (IS:5290) with individual shut off valves and cast iron wheels. Landing valves shall have flanged inlet and instantaneous type outlet as shown on the drawings.

Instantaneous outlets for fire hydrants shall be standard pattern approved and suitable for fire brigade hoses.

Contractor shall provide for each internal fire hydrant station two numbers of 63mm dia, 15 metre long rubberized fabric lined hose pipes with gunmetal male and female instantaneous type coupling machine wound with CI wire (Hose to IS:636 and couplings to IS:903 with IS certification), fire hose reel, S.S. branch pipe with nozzle IS:903 and fireman's axe.

Each hose box shall be conspicuously painted with the letters "FIRE HOSE".

6.0 HOSE PIPE, BRANCH PIPE & NOZZLE:

6.1 HOSE PIPES:

Two numbers Hose Pipes shall be rubber lined woven jacketed and 63mm in dia. 15m long. They shall confirm to type A (Reinforced rubber lined) of IS: 636 - 1979. The hose shall be sufficiently flexible and capable of being rolled.

Each run of hose shall be complete with necessary coupling at the ends to match with the landing valve or with another run of hose pipe or with branch pipe. The couplings shall be of instantaneous swinging type. This shall be conforming to IS: 903.

6.2 BRANCH PIPES:

Branch pipe shall be of S.S. as given in BOQ 63 mm dia and be complete with male instantaneous spring lock type coupling for connection to the hose pipe. The branch pipe shall be externally threaded to receive the nozzle.

6.3 NOZZLE:

The nozzle shall be of S.S.as specified in BOQ 20 mm in (internal) diameter. The screw threads at the inlet connection shall match with the threading on the branch pipe. The inlet end shall have a hexagonal head to facilitate screwing of the nozzle on to the branch pipe with nozzle spanner.

End Couplings, Branch pipe, and Nozzles shall conform to IS: 903 - 1985.

7.0 HOSE REEL:

Contractor shall provide standard fire hose reels with 25mm dia, rubber hose of 30 metres length with S.S nozzle with 8mm bore, and control valve, connected wall mounted on circular hose reel of heavy duty mild steel construction and cast iron brackets. Hose reel shall conform to IS:884-1969. The hose reel shall be connected directly to the pipe riser through an independent connection.

8.0 FIRE HOSE CABINETS:

Provide MS / FRP cabinets for internal / external hydrants with single or double glass front door and locking arrangement with breakable glass key access arrangement, duly painted red with stove enameled paint fixed to wall or self supported on floor as per site conditions. The cabinet shall also have a separate chamber to keep the key with breakable glass as per approved design. Hose cabinets shall be stove enameled fire red paint with “FIRE HOSE” written on it prominently. Samples of hose cabinet for internal and external works be got approved from Client’s Representative/ Consultant before installation at site.

Fire hose cabinet suitable to accommodate 2 Nos. 15 metres long R.R.L. hoses, 1 No. branch pipe and nozzle.

9.0 FIRE BRIGADE INLET CONNECTIONS:

Fire Brigade inlet connection shall be provided for Fire Tender. It should be installed at a point near the entry to the premises where a fireservice vehicle can approach easily & feed water in system line as well as in underground water tank.

C.I. Two way fire brigade inlet with isolation and check valve shall be installed and connected to system line.

C.I. Four way fire brigade inlet with isolation valve shall be installed and connected to under ground water tank.

10.0 AUTOMATIC SPRINKLER SYSTEM:

Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install the sprinkler system as required by the drawings and specified hereinafter or given in this Bill of Quantities.

Automatic sprinkler system has been installed at basement parking area. Sprinklers shall be 15mm dia, Quartz bulb type G.M. & operate at 57° C/68° C. Sprinkler should be Pendent / Upright /Side wall type.

Sprinkler system should be connected with M.S. piping, drain pipe & assembly, flow switch, butterfly valve etc. Water supply to the sprinkler system shall be fed from the main electric driven pump.

Alarm valve shall comprise of a cast iron / ductile iron body with gunmetal trim, and double seated clapper check valves, pressure gauges, test valve and orifice assembly and drain valve with pressure gauges, turbine water gong including all accessories necessary and required and as supplied by original equipment manufacturer and required for full and satisfactory performance of the system. A cast iron isolation valve with lock and chain at the inlet of the installation valve shall be provided.

Contractor shall supply spare Sprinkler Heads of each type as per requirement and one Spanner for each type of sprinkler neatly installed in a steel box with glass shutters at locations approved by the Engineer-in-Charge.

a) Sprinkler mains, branch and connection from piping complete with valves, hangers, appurtenances and painting.
b) Sprinkler heads with spare sprinklers.
c) Connections to risers, pumps and appliances.
d) Flow switches, installation valve.
e) Vertical drain pipes.

11.0 ORIFICE FLANGES:

Provide orifice flanges fabricated from 6mm thick stainless steel plate to reduce pressure on individual Hydrants/ sprinkler to restrict the operating pressure to 3.5 Kg/cm². The design of the orifice flanges shall be given by the Contractor as per the location and pressure conditions of each hydrants/hose reel and get approved from Client's Representative before installation.

12.0 FIRE EXTINGUISHERS:

Installation of fully charged and tested Fire Extinguishing Hand Appliances Carbon Dioxide (Co2) type extinguisher of 4.5 kg,6 kg DCP / ABC powder as required by these specifications and drawings.

Fire extinguishers shall conform to the following Indian Standard specifications and shall be with BIS approved stamp as revised and Amended upto date.

a) CO2 Type : IS:15683
b) ABC Powder Type : IS:15683

Fire extinguishers shall be installed as per Indian Standard Code of practice for selection, installation and maintenance of portable first aid appliances IS:2190-1979.

Hand appliances shall be installed in readily accessible locations with the Appliance brackets fixed to wall by suitable anchor fasteners.

Each appliances shall be provided with an inspection, testing, change of charge and other relevant data.

All appliances shall be fixed in a true workman like manner truly vertical and at current locations.

The Extinguisher shall be so distributed over the entire floor area that a person has to travel not more than 15 Mtr. to reach the nearest fire extinguishers.

13.0 SIGNAGES:

Fire Exit Signage: Self illuminate Exit Signage have been provided near all Stairwells, as well as along the Corridors and passages.

Equipment & Instruction Signages: Signages have been provided near all the equipment / shaft (i.e. Hydrant valve, Hose Reel, Fire Extinguishers etc) for easy to use.

14.0 BALL VALVES:

S.S. ball valves shall be provided with each Hose reel & wherever required for drain purpose as mentioned in BOQ/ Drawing.

15.0 FIRE PUMPS:

15.1 SCOPE:

Contractor shall furnish all labour, materials, equipment for supply, installation testing and commissioning of complete fire pumping system. In general, the item of works shall include but not limited to the following:

a) 1 no. of Hydrant Pump - Electrically operated pump
b) 1 no. of Sprinkler Pump - Electrically operated pump
c) 1 no. of Standby Pump – Diesel Engine Driven pump
d) 2 nos. of Jockey Pump - Electrically operated pump

e) Complete electrical system, Panels for pumps.

15.2 HYDRANT & SPRINKLER PUMP (ELECTRIC DRIVEN):

Contractor shall provide and install electrically operated fire pumps of capacity and head indicated in the Drawings/Bill of Quantities.

Pumping sets shall be single stage horizontal End suction centrifugal type. The delivery pressure at pump outlet shall be not less than 9.0 Kg./cm^2 in any case.

Pumps shall be capable of giving a discharge of not less than 150 % of the rated discharge at a head of not less than 65% of the rated head. The shut off head shall be within 120% of rated head.

The pump casing shall be of cast iron of grade FG 200 to IS:210 and parts like impeller, shaft sleeve, wearing ring etc. shall be of non-corrosive metal like bronze/brass/gun metal. The shaft shall be of stainless steel.

Bearing of the pump shall be effectively sealed to prevent loss of lubricant or entry of dust or water.
The pump shall be provided with a plate indicating the suction lift, delivery head, discharge, speed and number of stages.

The pump casing shall be designed to withstand 1.5 times the working pressure.

15.3 MOTORS FOR ELECTRIC DRIVEN PUMPS:

15.3.1 MOTOR:

The motor shall be squirrel cage A.C. induction type suitable for operation on 415 volts 3 phase 50 Hz. System. Degree of protection shall be IP 55. The class of insulation shall be F. Temperature rise limit up to class 'B', duty 'S1'The synchronous speed shall be 3000 RPM as specified. The motor shall be rated for continuous duty and shall have a horse power rating necessary to drive the pump at 150% of its rated discharge with at least 65% rated head. The motor shall conform to I.S. 325 - 1978.

15.3.2 MOTOR STARTER:

The motor starter shall be soft or variable frequency drive type conforming to IS : 1822 - 1967. The unit shall include suitable current transformer and ammeter of suitable range on one line to indicate the current. The starter shall not incorporate under voltage no voltage trip overload or SPP.
The starter assembly shall be suitably integrated in the power and control panel for the wet riser system.

15.4 JOCKEY PUMP (ELECTRIC DRIVEN):

The discharge of the Jockey Pump shall be 10% of rated discharge of the main fire pump. The pump shall be horizontal split casing / End Suction type single stage or multi stage as specified. The pump casing shall be cast iron and parts like impeller, shaft sleeve, wearing ring etc. shall be non-corrosive metal like bronze, brass or gun metal. The shaft shall be of stainless steel. Bearings of the pump shall be effectively sealed to prevent loss of lubricant or entry of dust/ water.

The pump casing shall be designed to withstand 1.5 times the working pressure.

15.5 MOTOR FOR ELECTRIC DRIVEN PUMP:

15.5.1 MOTOR:

The motor shall be squirrel cage A.C. induction type suitable for operation on 415 volts 3 phase 50 Hz. System. Degree of protection shall be IP 55. The class of insulation shall be F. Temperature rise limit up to class 'B', duty 'S1' The synchronous speed shall be 3000 RPM as specified. The motor shall be rated for continuous duty and shall have a horse power rating necessary to drive the pump at 150% of its rated discharge with at least 65% rated head. The motor shall conform to I.S. 325 - 1978.

15.5.2 MOTOR STARTER:

The motor starter shall be soft or variable frequency drive type with overload trip, but without under voltage / no volt trip. An independent single phasing preventer shall be provided for each motor. The unit shall include ammeter of suitable range on the one line to indicate the current with current transformer as necessary. Starter shall conform to IS 1822 - 1967. The starter shall be integrated in the power and control panel for the wet riser system.

15.6 DIESEL ENGINE:

15.6.1 ENVIRONMENTAL CONDITIONS:

The engine shall be required to operate under the conditions of environment as specified the place of installation.

15.6.2 ENGINE RATING:

The engine shall be cold starting type without the necessity of preliminary heating of the engine cylinders or combustion chamber (for example, by wicks, cartridge, heater plugs etc.). The engine shall be multi cylinder / vertical 4 stroke cycle, water cooled, diesel engine, developing suitable HP at the operating speed specified to drive the fire pump. Continuous capacity available for the load shall be exclusive of the power requirement of auxiliaries of the diesel engine, and after correction for altitude, ambient temperature and humidity for the specified environmental conditions. This shall be at least 20% greater than the maximum HP required to drive the pump at its duty point. It shall also be capable of driving the pump at 150% of the rated discharge at 65% of rated head. The engine shall be capable of continuous non-stop operation for 8 hours and at least 3000 hours of operation before major overhaul. The engine shall have 10% overload capacity for one hour in any period of 12 hours continuous run.

The engine shall accept full load within 15 seconds from the receipt of signal to start. The diesel engine shall conform to BS 649/IS 1601/IS 10002, all amended up to date.

15.6.3 ENGINE ACCESSORIES:

The engine shall be complete with the following accessories:-

a) Fly wheel dynamically balanced.
b) Direct coupling for pump and coupling guard.
c) Radiator with hoses, fan, water pump, drive arrangement and guard.
d) Corrosion Resister.
e) Air cleaner, oil bath type / dry type.
f) Fuel service tank support, semi-rotary pump and fuel oil filter with necessary pipe work.
g) Pump for lubricating oil and Lub. oil filter.
h) Elect. starting battery (2 x 12 v).
i) Exhaust silencer with necessary pipe work.
j) Governor.
k) Instrument panel housing all the gauges, including Tachometer, hour meter and starting switch with key (for manual starting).
l) Necessary safety controls.
m) Winterization arrangement, where specified.

15.6.4 COOLING SYSTEM:

The engine cooling system shall be radiator water cooled system. The radiator assembly shall be mounted on the common bed plate. The radiator fan shall be driven off the engine as its auxiliary with a multiple fan belt. When half the belts are broken, the remaining belts shall be capable of driving the fan. Cooling water shall be circulated by means of an auxiliary pump of suitable capacity driven by the engine in a closed circuit.

15.6.5 FUEL SYSTEM:

The fuel shall be gravity fed from the engine fuel tank to the engine driven fuel pump. The engine fuel tank shall be mounted either over or adjacent to the engine itself or suitably wall mounted on brackets at a height not less than 60 cm above the fuel injection pump. The fuel filter shall be suitably located to permit easy servicing.

All fuel tubing to the engine shall be with copper, with flexible hose connections where required. Plastic tubing shall not be permitted.

The fuel tank shall be of welded steel construction (3mm thick) and of capacity sufficient to allow the engine to run on full load for at least 8 hours. The tank shall be complete with necessary floor mounted supports, level indicator (protected against mechanical injury) inlet, outlet, overflow connections and drain plug and piping to the engine fuel tank. The outlet should be so located as to avoid entry of any sediment into the fuel line to the engine.

A semi rotary hand pump for filling the daily service tank together with hose pipe 5 mtr. long with a foot valve etc. shall also form part of the scope of work or as specified in Bill of Quantities.

15.6.6 LUBRICATING OIL SYSTEM:

Forced feed Lub. oil system shall be employed for positive lubrication. Necessary Lub. oil filters shall be provided, located suitably for convenient servicing.

15.6.7 STARTING SYSTEM:

The starting system shall comprise necessary batteries (2x12v), 24 volts starter motor of adequate capacity and axle type gear to match with the toothed ring on the fly wheel. By metallic relay protection to protect starting motor from excessively long cranking runs suitably integrated with engine protection system shall be included within the scope of the work.

The capacity of the battery shall be suitable for meeting the needs of the starting system.

The battery capacity shall be adequate for 10 consecutive starts without recharging with cold engine under full compression.

The scope shall cover all cabling, terminals, initial charging etc.

15.6.8 EXHAUST SYSTEM:

The exhaust system shall be complete with silencer suitable for outdoor installation, and silencer piping including bends and accessories needed for a run of 5 meter from the engine manifold. (Adjustment rates for extra lengths shall also be given). The total back pressure shall not exceed the engine manufacturer's recommendation. The exhaust piping shall be suitably lagged.

15.6.9 ENGINE SHUT DOWN MECHANISM:

This shall be manually operated and shall return automatically to the starting position after use.

15.6.10 GOVERNING SYSTEM:

The engine shall be provided with an adjustable governor to control the engine speed within 5% of its rated speed under all conditions of load up to full load. The governor shall be set to maintain rated pump speed at maximum pump load.

15.6.11 ENGINE INSTRUMENTATION:

Engine instrumentation shall include the following:-

a) Lub. Oil pressure gauge.
b) Lub. Oil temperature gauge.
c) Water pressure gauge.
d) Water temperature gauge.
e) Tachometer.
f) Hour meter.

The instrumentation panel shall be suitably resident mounted on the engine.

15.6.12 ENGINE PROTECTION DEVICES:

Following engine protection and automatic shut down facilities shall be provided:-

a) Low lub. oil pressure.
b) High cooling water temperature.
c) High lub. oil temperature.
d) Over speed shut down.

15.6.13 PIPE WORK:

All pipe lines with fittings and accessories required shall be provided for fuel oil, lub. oil and exhaust system, copper piping of adequate sizes shall be used for lub. oil and fuel oil. M.S./G.I. piping will be permitted for exhaust.

15.6.14 ANTI VIBRATION MOUNTING:

Suitable vibration mounting duly approved by engineer-in-charge shall be employed for mounting the unit so as to minimize transmission of vibration to the structure. The isolation efficiency achievable shall be clearly indicated.

15.6.15 BATTERY CHARGER:

Necessary float and boost charger shall be incorporated in the control section of the power and control panel, to keep the battery under trim condition. Voltmeter to indicate the state of charge of the batteries shall be provided.

15.7 AIR VESSEL FOR FIRE PUMPS:

Provide on air vessel fabricated from 8 mm M.S. sheet with dished ends and suitable supporting legs, one 25mm dia drain with valve and 25mm ball valve with all necessary accessories. The vessel shall be 450mm x 2000mm dia. high and tested to 13.5 Kg/cm² pressure.

The fire pumps shall operate on drop of 1 Kg/cm² pressure in the mains. The pump operating sequence shall be arranged in a manner to start the pump automatically but should be stopped manually by starter push buttons only.

15.8 CONTROL PANEL:

15.8.1 CUBICAL PANEL:

The main switch board cubicle panel shall be of floor mounted type, totally enclosed, dust and vermin proof made from 14 SWG M.S. sheet of suitable size duly painted with one coat of anti-corrosive paint and two coats of synthetic enamel paint of approved make and shade with stove enameled finish. The cubical shall comprise of the followings:

a. Incoming main M.C.C.B unit of required capacity.
b. Outgoing M.C.C.Bs one for each motor.
c. Aluminiumbusbar of suitable capacity.
d. Fully Automatic SOFT starter suitable for the motor H.P. with Push Buttons and ON/OFF indicating light one for each motor for all pumps.
e. Single phasing preventers one for each motor.
f. 96 mm^2 panel type Ampere meters - one for each motor complete with CTs.

g. 150 mm^2 voltmeter on incoming main with rotary selector switch to read voltage between phase to neutral and phase to phase.
h. Three neon phase indicating lamps.
i. Rotary switch for manual/auto operation.
j. All color coded internal and inter-connecting wiring from incoming main to bus bar, switch board panel and power/control cables from switch board cubicle to motors, engine and batteries etc. complete in all respect.

All switchgears and accessories shall be approved make to relevant IS codes and to the satisfaction of Client's Representative/Consultant and rating of all equipment must match the KW of motors included and as per TAC rules. All electrical work to be carried out as per TAC and NBC rules/specifications.

15.8.2 EARTHING:

There shall be two independent earthing stations at least 3 meters away from the pump room. Each earth electrode shall consist of GI earth plate 600mmx600mmx6mm thick including accessories and masonry enclosure with cover plate having locking arrangement. All electrical apparatus, cable boxes and sheath/armour clamps shall be connected to the main bar by means of branch earth connection of 25mm x 5mm copper strip. All joints in the main bar and between main bar and branch bars shall have the lapping surface properly tinned to prevent oxidation. The joints shall be riveted and sheathed. The main earthing strip shall be 25 x 5mm copper in 40mm dia G.I. pipe from earth electrode as required.

Earth plates shall be buried in a pit 1.2 x 1.2m at minimum depth of 3 meters below ground. The connections between main bar shall be made by means of these 10 mm studs and fixed at 100mm centers. The pit shall be filled with coke breeze, rock salt and loose soil. A G. I pipe of 29mm dia with perforations on the periphery shall be placed vertically over the plates to reach ground level or watering.

A brick masonry man hole 30x30x30cms size shall be provided to surround the pipe for inspection. A bolted removable link connecting main bar outside the pit portion leading to the plates shall be accommodated in this manhole for testing.

Earthing shall be done complete as per NBC / TAC specifications.

15.8.3 CABLING:

All cables from switch board panel to the motors shall be PVC insulated and PVC sheathed armoured aluminum conductor power cables of 650/1100 V grade conforming to IS:1553. The cables of required size shall be suitable for laying on surface of wall or in flooring with suitable clamps. Necessary cable trays shall deemed to be included in this item as per site requirements.

The termination shall be with brass compression glands suitable for PVC sheathed armouredaluminium conductor cable of 1.1 KV "A' grade of the required size.

15.9 PRESSURE GAUGE & PRESSURE SWITCH:

Contractor shall provide 150 mm dia Pressure Gauge of range 0 - 15 Kg /cm^2 conforming to IS - 3624 having bourdon tube of stainless steel 310 in cast aluminium, stove enamelled, black, weather proof case with outer, screwed aluminium bezel and complete with necessary U-type stainless steel siphon tube and cock including providing suitably painted angle iron support to the tube.Pressure gauge shall be provided at each pump suction, delivery line & common delivery header.

Contractor shall provide Pressure Switches for automation of fire pumps. Pressure switches shall be double pole single throw type suitable for 3 phase supply with diaphragm. AluminumEnclosure with IP 66 protection as required.

15.10 'Y' WITH STRAINER:

Contractor shall provide C.I. 'Y' strainer at pump suction as specified in Bill of Quantity.

16.0 PUMP ON/OFF REMOTE SWITCHES:

Contractor shall supply, install, testing & commissioning of pump on/off remote switches to each hydrant/hose reel point with all necessary fittings, accessories & cable.

17.0 TESTING OF THE SYSTEM:

All piping shall be tested to hydrostatic test pressure of 12 Kg/Cm² for a period of not less than 2 hours. All leaks and defects in joints revealed during the testing shall be rectified to the satisfaction of the Client's Representative.

Piping required subsequent to the above pressure test shall be re-tested in the same manner.

System may be tested in sections and such sections shall be securely capped.

The Client's Representative shall be notified well in advance by the Contractor of his intention to test a section of piping and all testing shall be witnessed by the Client's Representative.

The Contractor shall make sure that proper noiseless circulation of fluid is achieved through the system concerned. If proper circulation is not achieved due to air bound connections, the Contractor shall rectify the defective connections. He shall bear all the expenses for carrying out the above rectification including the tarring-up and re-finishing of floors, walls etc. as required.

The Contractor shall provide all materials, tools, equipment, instruments, services and labor required to perform the test, and shall ensure that the plant room and other areas are cleaned up and spill over water is removed.

The Contractor shall give the pressure test of head for external yard hydrant at ground level and also for hydrant at terrace level.

All air shall be trapped from the pipeline through hydrants, Hose Reel& air valves. Each section of the pipeshall be slowly filled with the water & allow to stand the water for few hours with the ends closed.

Flushing of underground connections: Underground mains and lead-in connections to system risers Shallbe flushed before connections made to piping in order remove foreign materials which may have entered the underground during the course of installation. For hydrant system the flushing operation shall be continued until water is clear.

18.0 COMMISSIONING OF SYSTEM :

Before commissioning, the entire system shall be flushed to ensure that any earth /foreign matters which might have entered during installation are taken out. For this, pump may be operated and valves opened at different locations.

As soon as the work is complete, the system shall be commissioned and made available for use. Requirement of fire fighting installations is equally important during occupation of the building. If the building is to be occupied in part, fire fighting system of building completed shall Commissioned by isolating the system of under construction portion of the building.

The fire fighting system shall be maintained and manned from the very first day of its Commissioning.

Any defects noticed during the warranty period shall be promptly attended by the Contractor and availability of the system at all time is to be ensured.

19.0 ACCEPTANCE TEST:

At the time of taking over, the hydrant system shall fulfil the following acceptance tests:-
Starting up of the pressure suction (Jockey Pump): The pressure switch shall be set at 7.0 kg/cm^2 at the lower limit and 8.0 kg/cm^2 at the upper limit. The system drain shall be opened to cause a drop in the pressure. The Pump shall start as soon as the pressure gauge needle falls down to 7.0 kg/cm^2. The pump shall also stop automatically when the system has been pressurized again up to required pressure (8 kg/cm^2).

All these tests mentioned above shall be repeated after one hour interval. The result of all the tests shall be identical again. After the system has satisfactorily withstood the above tests, it can be taken over from the contractor.

20.0 START-UP / SYSTEM TESTING:

It will be the responsibility of the tendered to cause interim/stage inspection by the TAC/CFO during execution of the work as and when so called for by the Employer / Architect and shall carry out any rectification / modification as may be suggested by the Tariff Advisory Committee (TAC) / State Fire Officer (CFO).

Soon after the work is completed, the contractor shall inform the TAC/CFO in writing with a copy to the Architect / Employer for getting the complete system including all sub system and instrumentation, control etc. thoroughly inspected and tested for satisfactory performance. After satisfactory completion of tests of the systems by the TAC / CFO the contractor shall be required to submit in built drawings on tracing cloth to the Architect which have been so approved.

In addition to TAC, the contractor shall also be responsible for getting the system and equipment tested and approved by other Statutory Authorities like the Area Fire Officer or the State Fire Services as may be required.

21.0 HANDING OVER:

All commissioning and testing shall be done by the Contractor to the complete satisfaction of the Engineer-in-Charge / Consultants, and the job handed over to the Client.Contractor shall also hand over to the Client all maintenance and operation manuals and all items as per the terms of the contract.

C. CODES & STANDARDS

SR. NO.	IS NO.	TITLE
1	IS: 325	Motors
2	IS:458	Hume Pipe
3	IS:636	RRL Hose
4	IS:778	Gun Metal valves
5	IS:14846	Sluice valve
6	IS:884	Fire Hose Reel
7	IS:903	Fire Hose, couplings, branch pipe, nozzles
8	IS:1239 / 3589	G. I. Pipe / M.S. pipe
9	IS:5132	Rubber Hose Pipe
10	IS:13095 / API 609	Butterfly valves
11	IS:5290	Fire Hydrants
12	IS:5312 / API 594/598	Non Return Valves
13	IS:6595 / 12469	Pumps
14	IS:8423	C. P. Hose
15	IS:10001 / 10002	Diesel Engine
16	IS:10221	Coating / wrapping of underground M.S. pipe
17	IS:15683	Fire Extinguishers
18	IS:12349	Signages

D. MAKE LIST

SR. NO.	ITEM DESCRIPTION	MATERIAL
1	Air Release Valve	Swati / Sant / Newage
2	Butterfly Valves, Gate / Sluice Valve and Non return Valve	Sant / Leader / Zoloto
3	Branch pipe & Coupling	Swati / Winco / Newage
4	Centrifugal Pumps	Matter & Platt – Wilo / Grundfoss / Xylem / Kirloskar
5	Coating wrapping material for Underground pipe	IWL / STP / Tikidan
6	Fire Bridged Inlet Connection	Swati / Winco / Newage
7	Fire Extinguishers	Safex / Minimax / Kanex
8	Flow Switch	Honeywell / System Sensor / Potter / Newage / Viking
9	Globe Valve / Ball Valve	Sant / Leader / Zoloto
10	Hydrant Valve	Swati / Winco / Newage
11	Hose Pipe	Swati / Winco / Newage
12	Hose Reel	Swati / Winco / Newage
13	Hose Box	Swati / Winco / Newage
14	M.S. / G. I. pipes	TATA / Jindal (Hissar) / SAIL
15	Motor	ABB / CGL / Siemens / BHEL / Kirlosker / BBL
16	Pressure gauge	H. Guru / Fibig / General instrument
17	Pressure switch	Honeywell / Indfoss / Switzer
18	Power and Control cable	Polycab / Havell's / Finolex
19	Panels	CPRI approved
20	Strainer	Sant / Leader / Zoloto
21	Sprinklers & Flexible Hose / Fire Alarm valve	HD / Tyco / Newage / Viking
22	Signages	Prolite / Mr.Lite
23	Pump on/off switch	C & S / L&T / equivalent
24	Painting	Asian paint / Burger / Nerolac