Tender Document for
Selection of Developer-cum-Operator (DCO) for setting up & operation of ‘Rail Neer’ Packaged Drinking Water Plant at 07 locations i.e. Mandideep (near Bhopal), Dist. Raisen (MP), Sanand-II (near Ahmedabad), Bhusawal, Jagi Raod (near Guwahati), Mallavalli (near Vijayawada), Ranchi, Maneri - Dist. MANDLA (near Jabalpur)

(Containing Two Bids)
(Qualification & Financial Proposal)

Tender No. 2017/IRCTC/RNP/PDW/OT/02 Dated: 12-09-2017


Last Date of submission of bids : 27.10.2017 upto 1500 hrs.

Date of opening of Tenders : 27.10.2017 at 1515 hrs.

Address for communication : IRCTC Ltd., 11th Floor, A-Wing, Statesman House, 148, Barakhamba Road, Connaught Place, New Delhi-110 001

Cost of Tender Document : 5000/- (Rs. 50/- extra by post) per project
Disclaimer

The information contained in this Tender Document or subsequently provided to Bidder(s), whether verbally or in documentary or any other form, by or on behalf of the Indian Railway Catering and Tourism Corp Ltd. or any of its employees or advisors, is provided to Bidder(s) on the terms and conditions set out in this Tender Document and such other terms and conditions subject to which such information is provided.

This Tender Document is not an agreement and is neither an offer nor invitation by IRCTC to the prospective Bidders or any other person. The purpose of this Tender Document is to provide interested parties with information that may be useful to them in the formulation of their proposal pursuant to the Bidding Documents including this Tender Document (the “Bid”). This tender document includes statements, which reflect various assumptions and assessments arrived at by IRCTC in relation to the Project. Such assumptions, assessments and statements do not purport to contain all the information that each Bidder may require. This Tender Document may not be appropriate for all persons, and it is not possible for IRCTC, its employees or advisors to consider the investment objectives, financial situation and particular needs of each party who reads or uses this Tender Document. The assumptions, assessments, statements and information contained in this Tender Document may not be complete, accurate, adequate or correct. Each Bidder should therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this Tender Document and obtain independent advice from appropriate sources.

Information provided in this Tender Document to the Bidder(s) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. IRCTC accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

IRCTC, its employees and advisors make no representation or warranty and shall have no liability to any person, including any Bidder, under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this Tender Document or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the Tender Document and any assessment, assumption, statement or information contained therein or deemed to form part of this Tender Document or arising in any way with qualification of Bidders for participation in the Bidding Process.

IRCTC also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this Tender Document.

IRCTC may, in its absolute discretion but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this Tender Document.

The issue of this Tender Document does not imply that IRCTC is bound to select a bidder or to appoint the selected Bidder or DCO, as the case may be, for the Project and IRCTC reserves the right to reject all or any of the Bids without assigning any reasons whatsoever.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by IRCTC or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and IRCTC shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by an Bidder in preparation or submission of the Bid, regardless of the conduct or outcome of the Bidding Process.
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1. INTRODUCTION

1.1 Background

1.1.1 Indian Railway Catering and Tourism Corporation Limited (IRCTC) is a public sector company fully owned by the Ministry of Railways and incorporated under the Companies Act 1956. IRCTC was formed to manage catering and hospitality services at railway stations, trains, and other railway locations. IRCTC also promotes domestic and international tourism through development of budget hotels, special tour packages, publicity and global reservations systems. As part of its catering services, IRCTC supplies Packaged Drinking Water under its brand name “Rail Neer” at stations and trains of the Indian Railways.

1.1.2 IRCTC presently produces packaged drinking water under its “Rail Neer” brand at seven plants in Delhi, Patna, Chennai, Mumbai, Amethi, Parassala & Bilaspur with a total installed capacity of approximately 8.3 lakh bottles per day. Construction of three more plants at Nagpur (installed capacity of 0.72 lakh bottles/day), Sankrail & Hapur (installed capacity of 0.1 lakh bottles/day each) are under way for commissioning.

1.1.3 To cater to the large and increasing packaged drinking water demand, IRCTC intends to expand its packaged drinking water operations by setting up new packaged drinking water plants at few more locations.

1.1.4 As part of this endeavor, IRCTC has decided to set up seven company owned plants at Mandideep (near Bhopal), Dist. Raisen (MP), Sanand-II (near Ahmedabad), Bhusawal, Jagi Raod (near Guwahati), Mallavalli (near Vijayawada), Ranchi, Maneri - Dist. MANDLA (near Jabalpur) and decided to carry out the bidding process for selection of private entities as the bidders to whom the Projects may be awarded. A description of the project is given in the Chapter-Project Information Memorandum.

1.1.5 An amount of Rs. 8.00 (Eight) crores (Rs. 5.20 crore for plant & machinery including DG set + Rs. 2.80 crore for civil, electrical and allied works) will be funded by IRCTC. Rs. 8.00 crore is all inclusive and the contractor will issue tax invoice to IRCTC to claim this amount for enabling IRCTC to avail input tax credit (ITC). The same will be released as per clauses set out in part A and part B of chapter 5 i.e. Payment Schedule to set up the plant.

1.1.6 IRCTC has already procured land for 04 locations i.e. State Government/State Industrial Corporations at Industrial Area, Mandideep Phase-II, Dist. Raisen (MP), GIDC Sanand-II (near Ahmedabad), MIDC Bhusawal & Jagi Raod (near Guwahati) and the procurement of land is in process for 03 locations i.e. Mallavalli (near Vijayawada), Patratu (near Ranchi) & Maneri - Dist. MANDLA (near Jabalpur). Under normal circumstances, the plant will be set up at identified sites. However, in exceptional circumstances, IRCTC may be free to procure any other site of required size approximately within 250 km radius of the original site and license it to the DCO. Rail Neer Plant thus set up will be owned by IRCTC and all licenses/Clearances will be in the name of IRCTC. DCO will be operating &
maintaining the plant to manufacture Rail Neer and will be required to pay administrative/right to operate and maintain charges of Rs. 40 lakh plus applicable taxes to IRCTC for each plant for 1st year operation which will be payable at the time of commencement of the commercial production of the Rail Neer. In subsequent years, this will be payable at the beginning of each operational year with an increase of 7% annually. In case of late payment, an interest @12 % per annum will be charged.

1.1.7 IRCTC intends to qualify and select, for each project, suitable Bidder (the "Bidder") awarding the Projects through a two envelope open competitive bidding process in accordance with the procedure set out herein. RFP or Tender Document referred here are one and the same.

1.1.8 The selected Bidder for each Project, who undertakes to incorporate a company under the Companies Act, 1956 prior to execution of the agreement (the "Developer-cum-Operator" or “DCO”), shall be responsible for designing, engineering, procurement, construction, operation and maintenance of the Project under and in accordance with the provisions of a long term contract agreement (the "Agreement") to be entered into between the DCO and IRCTC in the form provided by IRCTC as part of the Bid Documents pursuant hereto.

1.1.9 The scope of work will broadly include:

(i) Construction of plant and installation of fully automatic packaged drinking water plant(s) based on Reverse Osmosis (RO) or superior technology.
(ii) Operation and maintenance thereof and supply of a predefined quantity of packaged drinking water (PDW) bottles to IRCTC or any agency appointed by IRCTC on its behalf on an exclusive basis under IRCTC’s brand name and
(iii) Clearing & forwarding and transportation services in accordance with terms and conditions to be stipulated in the Agreement

1.1.10 The DCO shall be required to supply packaged drinking water bottles as required by IRCTC. The detailed terms of pricing is indicated in the Agreement.

1.1.11 The statements and explanations contained in this Tender Document are intended to provide a proper understanding to the Bidders about the subject matter of this Tender Document and shall not be construed or interpreted as limiting in any way or manner the scope of services and obligations of the Operator set forth in the Contract Agreement or IRCTC’s rights to amend, alter, change, supplement or clarify the scope of work, the Contract to be awarded pursuant to this Tender Document or the terms thereof or herein contained. Consequently, any omissions, conflicts or contradictions in the Bidding Documents including this Tender Document are to be noted, interpreted and applied appropriately to give effect to this intent, and no claims on that account shall be entertained by IRCTC.

1.1.12 IRCTC shall receive bids pursuant to this Tender Document in accordance with the terms set forth herein as modified, altered, amended and clarified from time to time by IRCTC, and all bids shall be prepared and submitted in accordance with such terms on or before the date for submission of the bids (the "Bid Due Date").

1.1.13 The Jurisdiction of court will be New Delhi.
1.2 Description of the bidding process

1.2.1 IRCTC has adopted a single-stage process (referred to as the "Bidding Process") for selection of the Bidders for award of the Projects. This stage shall comprise of two envelopes, **Envelope 1: Qualification and Envelope 2: Financial Proposal** of interested parties/consortia who make a Bid in accordance with the provisions of this Tender Document (the "Bidder", which expression shall, unless repugnant to the context, include the Members of the Consortium). Prior to making a bid, the Bidder shall pay to IRCTC a sum of Rs 5,000 (Rupees five thousand) per project applied for as the cost of the Tender Document by payment in cash at IRCTC office or through Demand Draft. In the event the Bidder has downloaded the Tender Document from the website of IRCTC, a demand draft of Rs. 5,000 (Rupees five thousand only) in favor of “Indian Railway Catering and Tourism Corporation Limited” payable at New Delhi, shall be submitted along with the Bid. As part of the Bidding Process, the Bidders are being called upon to submit their Bid in accordance with the terms specified in the Bidding Documents. The Bid shall be valid for a period of not less than 120 (one hundred and twenty) days from the Bid Due Date.

1.2.2 Under Envelope 1 (the “Qualification”), the Bidders would be required to furnish all the information specified in this Tender Document and as per Appendix-VI of Annexure-I. Financial Proposals of only those Bidders who qualify in accordance with Clause 3.4 of this Tender Document will be evaluated, remaining Financial Proposals of Bidders will be returned unopened.

1.2.3 Under Envelope 2 (the “Financial Proposal”), the Bids will be evaluated as per the process detailed in Clause 3.5 of this Tender Document.

1.2.4 Bids are invited for each Project on the overall basis of the quoted price per 1 litre bottle and CFA & Transport services (the "Price bid") as quoted by the bidder as per format at APPENDIX V. The price bid would be linked to Price Variation Clause as detailed in the document. The price bids of qualified bidders as per evaluation of Envelope 1: Qualification Clause 3.4 and documents as per Annexure-VI will be opened. The price bid for each project by qualified bidders shall constitute the sole criterion for awarding of project. The Project shall be awarded to the Bidder quoting the Lowest Price bid for the respective location. In this Tender Document, the term “Lowest Bidder” shall mean the Bidder who is seeking the lowest overall price per one litre bottle as specified in Clause 3.5 of this Tender Document.

1.2.5 Generally, the Lowest Bidder (L1) shall be the selected Bidder. The second lowest (L2) and third lowest (L3) Bidders shall be kept in reserve and may, in accordance with the process specified in the Tender Document, be considered in case such Lowest Bidder withdraws or is not selected for any reason.

1.2.6 In terms of the Tender Document, a Bidder will be required to deposit, along with its Bid, a bid security/Earnest Money Deposit (EMD) equivalent to Rs 5,00,000/- (Rs. Five Lakhs only) (the "Bid Security") per project, refundable after the LOA has been issued to the successful bidder, except in the case of the selected Bidder whose Bid Security shall be retained till it has provided a Performance Security under the Agreement. The Bidders will have to provide Bid Security in the form of a demand
draft drawn in favour of “Indian Railway Catering and Tourism Corporation” payable at New Delhi. The Bid shall be summarily rejected if it is not accompanied by the Bid Security. Separate Bid Security is to be submitted for each Project by the Bidder.

Bid security deposited is liable to be forfeited if the bidder withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of his offer.

1.2.7 As part of the Bid Documents, a Draft Contract Agreement and Project Information Memorandum Prepared by IRCTC/ its consultants and other information pertaining/relevant to the Projects available with it.

1.2.8 Bidders are invited to examine the Projects in detail, and to carry out, at their cost, such studies as may be required for submitting their respective Bids for award of the contract including implementation of the Projects.

1.2.9 Any queries or request for additional information concerning this Tender Document shall be submitted in writing or by fax and e-mail to the officer designated in Clauses 2.5.2 and 2.5.3 below. The envelopes / communications shall clearly bear the following identification / title:

"Queries / Request for Additional Information required for Location _________ concerning Tender no. : Tender Document for Selection of Developer-cum-Operator (DCO) for setting up of ‘Rail Neer’ Packaged Drinking Water Plants."
2. INSTRUCTIONS TO BIDDERS

2A GENERAL

2.1 General terms of bidding

2.1.1 No Bidder shall submit more than one Bid for one Project. A Bidder bidding individually or as a member of a Consortium shall not be entitled to submit another bid either individually or as a member of any Consortium for the same project, as the case may be. A bidder can bid for more than one project in which case the bidder shall have to indicate the Projects in which it is interested in Appendix-I for Qualification, in order of preference, and for each Project submit separate Financial Proposal under Envelope-2 along with separate Bid Security and separate Cost of Tender. A Bidder may bid for all 7 (seven) Projects, but will not be awarded more than 3 (three) projects in any condition. Bidder is required to submit his preference order for locations as mentioned in Annexure 1. In case a bidder is declared the lowest bidder for more than 3 (three) projects, such bidder will be awarded only 3 (three) projects based on preference order of such bidder. In case of no other response for remaining any locations, IRCTC reserves right to allot more than three locations to such bidder.

2.1.2 The Project Information Memorandum (PIM) for the Project is being provided only as a preliminary reference document by way of assistance to the Bidders who are expected to carry out their own surveys, investigations and other detailed examination before submitting their Bids. Nothing contained in the PIM shall be binding on IRCTC nor confer any right on the Bidders, and IRCTC shall have no liability whatsoever in relation to or arising out of any or all contents of the PIM. It may be noted that the site specified is subject to change.

2.1.3 Notwithstanding anything to the contrary contained in this Tender Document, the detailed terms specified in the Contract Agreement shall have overriding effect; provided, however, that any conditions or obligations imposed on the Bidder hereunder shall continue to have effect in addition to its obligations under the Contract Agreement.

2.1.4 The Bidders are expected to carry out their own surveys, investigations and other detailed examination of the Project before submitting their Bids. Nothing contained in the Bidding Documents shall be binding on IRCTC nor confer any right on the Bidders, and IRCTC shall have no liability whatsoever in relation to or arising out of any or all contents of the Bidding Documents.

2.1.5 The Bid should be furnished in the format at Appendix – I (including Annexures) to Appendix-V. The bid amount for each Project should be clearly indicated in Appendix-V in both figures and words, in Indian Rupees, and signed by the Bidder’s authorized signatory. In the event of any difference between figures and words, the amount indicated in words shall be taken into account. The Successful Bidder shall be subsequently invited for award of the contract.

2.1.6 The Bidder, in case of Single Entity, should submit a Power of Attorney as per the format at Appendix-II, authorizing the signatory of the Bid to commit the Bidder.

2.1.7 In case the Bidder is a Consortium, the Members thereof should furnish a Power of
Attorney in favour of the lead Member in the format at Appendix-III along with a Joint Bid Agreement in the format at Appendix-IV.

2.1.8 Any condition or qualification or any other stipulation contained in the Bid which is inconsistent with the terms of the Bidding Documents shall render the Bid liable to rejection as a non-responsive Bid.

2.1.9 The Bid and all communications in relation to or concerning the Bidding Documents and the Bid shall be in English language. Supporting documents and printed literature furnished by the Bidder with the Bid may be in any other language provided that they are accompanied by appropriate translations of the pertinent passages in the English language, duly authenticated and certified by the Bidder. Supporting materials, which are not translated into English, may not be considered. For the purpose of interpretation and evaluation of the Bid, the English language translation shall prevail.

2.1.10 The Bidding Documents including this tender document, Draft Contract Agreement and other documents which may be issued at a later stage including replies to queries, addendum etc., provided by IRCTC are and shall remain or become the property of IRCTC and are transmitted to the Bidders solely for the purpose of preparation and the submission of a Bid in accordance with the Bidding documents. Bidders are to treat all information as strictly confidential and shall not use it for any purpose other than for preparation and submission of their Bid. The Provisions of this Clause 2.1.10 shall also apply mutatis mutandis to Bids and all other documents submitted by the Bidders, and IRCTC will not return to the Bidders any Bid, document or any information provided along therewith.

2.1.11 The Bidder shall satisfy the following conditions:

(a) The Bidder may be a single entity or a group of entities (the "Consortium") as per the definition clause of contract agreement, coming together to implement the Project(s). However, no Bidder applying individually or as a member of a Consortium, as the case may be, can be member of another Bidder for the same Project or any other Project under the same tender document. The term Bidder used herein would apply to both a single entity and a Consortium.

(b) A Bidder may be a sole proprietorship, a company registered under the Companies Act 1956 or a Partnership Firm registered under Indian Partnership Act 1932 or Limited Liability Partnership Act 2008, and in case of consortium any combination of them with an agreement to form a Consortium.

2.1.12 A Bidder shall not have a conflict of interest (the “Conflict of Interest”) that affects the Bidding Process. In the event of disqualification, IRCTC shall be entitled to forfeit and appropriate the Bid Security and/or Performance Security, as the case may be, as liquidated damages, without prejudice to any other right or remedy that may be available to IRCTC under the Bidding Documents and/or the Contract Agreement or otherwise. Without limiting the generality of the above, determining the Conflict of Interest shall be the prerogative of IRCTC. Without limiting the generality of the above, a Bidder shall be deemed to have a Conflict of Interest affecting the Bidding Process, if:

(a) The Bidder, its Member or Associate (or any constituent thereof) and any other Bidder, its Member or any Associate thereof (or any constituent thereof)
have common controlling shareholders or other ownership interest; provided that this disqualification shall not apply in cases where the direct or indirect shareholding of a Bidder, its Member or an Associate thereof (or any shareholder thereof having a shareholding of more than 5% (five per cent) of the paid up and subscribed share capital of such Bidder, Member or Associate, as the case may be) in the other Bidder, its Member or Associate, is less than 5% (five per cent) of the subscribed and paid up equity share capital thereof; provided further that this disqualification shall not apply to any ownership by a bank, insurance company, pension fund or a public financial institution referred to in section 4A of the Companies Act, 1956. For the purposes of this Clause 2.1.12, indirect shareholding held through one or more intermediate persons shall be computed as follows: (aa) where any intermediary is Controlled by a person through management control or otherwise, the entire shareholding held by such controlled intermediary in any other person (the “Subject Person”) shall be taken into account for computing the shareholding of such controlling person in the Subject Person; and (bb) subject always to sub-clause (aa) above, where a person does not exercise control over an intermediary, which has shareholding in the Subject Person, the computation of indirect shareholding of such person in the Subject Person shall be undertaken on a proportionate basis; provided, however, that no such shareholding shall be reckoned under this sub-clause (bb) if the shareholding of such person in the intermediary is less than 26% of the subscribed and paid up equity shareholding of such intermediary; or

(b) A constituent of such Bidder is also a constituent of another Bidder;

(c) Such Bidder, its Member or any Associate thereof receives or has received any direct or indirect subsidy, grant, contractual loan or subordinated debt from any other Bidder, its Member or Associate, or has provided any such subsidy, grant, contractual loan or subordinated debt to any other Bidder, its Member or any Associate thereof;

(d) Such Bidder has the same legal representative for purposes of this Bid as any other Bidder;

(e) Such Bidder, or any Associate thereof, has a relationship with another Bidder, or any Associate thereof, directly or through common third party/ parties, that puts either or both of them in a position to have access to each other’s information about, or to influence the Bid of either or each other; or

(f) Such Bidder or any Associate thereof has participated as a consultant to IRCTC in the preparation of any documents, design or technical specifications of the Project.

_Explanation:_ In case a Bidder is a Consortium, then the term Bidder as used in this Clause 2.1.12, shall include each Member of such consortium. For purposes of this Tender Document, Associate means, in relation to the Bidder/Member, a person who controls, is controlled by, or is under the common control with such Bidder/Member. As used in this definition, the expression “control” means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person,
or the power to appoint majority of the directors on the board of directors of such company or corporation and/or the power to direct the management and policies of such person by operation of law, agreement or otherwise and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person by operation of law, agreement or otherwise.

2.1.13 Where the Bidder is a single entity, it shall be required to form an appropriate Special Purpose Vehicle, incorporated under the Indian Companies Act, 1956 (the "SPV"), to execute the Agreement and implement the Project. Any bidder getting more than one location will be required to form only one SPV. In case bidder has already formed SPV for previously allotted locations there is no need for formation of new SPV.

a) Number of members in a consortium shall not exceed 4 (four), but information sought in the Bid may be restricted to 2 (two members in the order of their equity contribution;

b) Subject to the provisions of sub-clause (a) above, the Bid should contain the information required for each member of the Consortium;

c) Members of the Consortium shall nominate one member as the lead member (the "Lead Member"), who shall have an equity share holding of at least 51% (fifty one per cent) of the paid up and subscribed equity of the SPV. The nomination(s) shall be supported by a Power of Attorney, as per the format at Appendix-III, signed by all the other members of the Consortium;

d) The Bid should include a brief description of the roles and responsibilities of individual members, particularly with reference to financial, technical and O&M obligations;

e) An individual Bidder cannot at the same time be member of a Consortium applying for pre-qualification. Further, a member of a particular Bidder Consortium cannot be member of any other Bidder Consortium applying for pre-qualification;

f) Members of the Consortium shall enter into a binding Joint Bidding Agreement, substantially in the form specified at Appendix-IV (the "Joint Bidding Agreement"), for the purpose of making the Bid and submitting a Bid in the event of being short-listed. The Joint Bidding Agreement, to be submitted along with the Bid, shall, inter alia:

(i) Convey the intent to form an SPV with shareholding/ownership equity commitment(s) in accordance with this Tender Document, which would enter into the Agreement and subsequently perform all the obligations of the Contractaire in terms of the Agreement, in case the contract to undertake the Project is awarded to the Consortium;

(ii) Clearly outline the proposed roles and responsibilities, if any, of each member;

(iii) Commit the minimum equity stake to be held by each member;

(iv) Commit that each of the members, whose experience will be evaluated for the purposes of this Tender Document, shall subscribe to 26%
(twenty six per cent) or more of the paid up and subscribed equity of the SPV and shall further commit that each such member shall, for a period of 5 (five) years from the date of commercial operation of the Project, hold equity share capital not less than: (i) 26% (twenty six per cent) of the subscribed and paid up equity share capital of the SPV; and (ii) 5% (five per cent) of the Total Project Cost specified in the Agreement;

(v) Commit that the Lead Member shall, upon constitution of the SPV, subscribe to 51% (fifty one per cent) or more of the paid up and subscribed equity of the SPV for a period of 5 (five) years from the commercial operation date of the Project;

(vi) Members of the Consortium undertake that they shall collectively hold all the subscribed and paid up equity of the SPV at all times until the fifth anniversary of the commercial operation date of the Project; and

(vii) Include a statement to the effect that all members of the Consortium shall be liable jointly and severally for all obligations of the Contractaire in relation to the Project until the Financial Close of the Project is achieved in accordance with the Agreement; and

(g) Except as provided under this the Bid Documents, there shall not be any amendment to the Joint Bidding Agreement without the prior written consent of the IRCTC.

2.1.14 Any entity which has been barred by the Central/ State Government, or any entity controlled by it, from participating in any project, and the bar subsists as on the date of Bid, would not be eligible to submit a Bid, either individually or as member of a Consortium.

2.1.15 An Bidder including any Consortium Member or Associate should, in the last 3 (three) years, have neither failed to perform on any contract, as evidenced by imposition of a penalty by an arbitral or judicial authority or a judicial pronouncement or arbitration award against the Bidder, Consortium Member or Associate, as the case may be, nor has been expelled from any project or contract by any public entity nor have had any contract terminated any public entity for breach by such Bidder, Consortium Member or Associate.

2.1.16 A Bidder shall be liable for disqualification and forfeiture of Bid Security if any legal, financial or technical adviser of IRCTC in relation to the Project is engaged by the Bidder, its Members or any Associate thereof, as the case may be, in any manner for matters related to or incidental to such Project during the Bidding Process or subsequent to the (i) issue of the LOA or (ii) execution of the Contract Agreement. In the event any such adviser is engaged by the Selected Bidder or Operator, as the case may be, after issue of the LOA or execution of the Contract Agreement for matters related or incidental to the Project, then notwithstanding anything to the contrary contained herein or in the LOA or the Contract Agreement and without prejudice to any other right or remedy of IRCTC, including the forfeiture and appropriation of the Bid Security or Performance Security, as the case may be, which IRCTC may have there under or otherwise, the LOA or the Contract Agreement, as the case may be, shall be liable to be terminated without IRCTC being liable in any manner whatsoever to the Selected Bidder or DCO for the same.

2.1.17 This Tender Document is not transferable.
2.1.18 Any award of Contract pursuant to this Tender Document shall be subject to the terms of Bidding

2.2 Change in composition of the Consortium

2.2.1 Where the Bidder is a Consortium, no change in composition of the Consortium shall be permitted by IRCTC during the Bid Stage.

2.3 Changes in Ownership

2.3.1 By submitting the Bid, the Bidder shall be deemed to have acknowledged that it was selected on the basis of Technical Capacity and Financial Capacity of those of its Consortium Members who will own at least 26% each of the subscribed and paid up equity of the Special Purpose Vehicle (SPV) to be formed by the Selected Bidder. The Bidder further acknowledges and undertakes that each of such Consortium Members shall continue to hold:

   i. At least 26% of the subscribed and paid up the equity of the DCO until 5th year from the Commercial Operation Date of the Project is achieved under and in accordance with the provisions of the Contract Agreement and

   ii. Collectively continue to own 51% of the subscribed and paid up of the DCO for the rest of the contract period.

The Bidder further acknowledges and agrees that the aforesaid obligation shall be the minimum, and shall be in addition to such other obligations as may be contained in the Contract Agreement, and a breach thereof shall, notwithstanding anything to the contrary contained in the Contract Agreement, be deemed to be a breach of the Contract Agreement and dealt with as such there under.

2.3.2 By submitting the Bid, the Bidder shall also be deemed to have acknowledged and agreed that in the event of a change in control of a Member whose Financial or Technical Capacity was taken into consideration for the purposes of evaluation under and in accordance with the Tender Document, the Bidder shall be deemed to have knowledge of the same and shall be required to inform IRCTC forthwith along with all relevant particulars about the same and IRCTC may, in its sole discretion, disqualify the Bidder or withdraw the LOA from the Successful Bidder, as the case may be. In the event such change in control occurs after signing of the Contract Agreement but prior to financial close of the Project, it would, notwithstanding anything to the contrary contained in the Contract Agreement, be deemed to be a breach of the Contract Agreement, and the same shall be liable to be terminated without IRCTC being liable in any manner whatsoever to the bidder. In such an event, notwithstanding anything to the contrary contained in the Contract Agreement, IRCTC shall be entitled to forfeit and appropriate the Performance Security, as liquidated damages, without prejudice to any other right or remedy that may be available to IRCTC under the Bidding Documents or otherwise.

2.3.3 The Members of Consortium other than the Lead Member whose Financial Capacity
and Technical Capacity has been utilized for the purposes of evaluation as per Clause 3, should for a period of 5 (five) years from the date of commercial operation of the Project, hold equity share capital not less than 26% (twenty six percent) of the subscribed and paid up equity of the SPV. The total number of Members of the Consortium whose Financial Capacity and Technical Capacity has been utilized for qualification cannot exceed 2 (two) including the Lead Member. For the avoidance of doubt, there can be more than 2 (two) consortium members, but only 2 (two) members, including lead member, would be evaluated for qualification;

2.3.4 The Lead Member should throughout the Contract Period, hold equity share capital not less than 51% (Fifty one percent) for first five year and thereafter not less than 26% of the subscribed and paid up equity of the SPV;

2.4 Cost of Bidding

2.4.1 The Bidders shall be responsible for all of the costs associated with the preparation of their Bids and their participation in the Bidding Process. IRCTC will not be responsible or in any way liable for such costs, regardless of the conduct or outcome of the Bidding Process.

2.5 Site visit and verification of information

2.5.1 Bidders are encouraged to submit their respective Bids after visiting the Project site and ascertaining for themselves the site conditions, location, surroundings, climate, availability of power, applicable laws and regulations, and any other matter considered relevant by them.

2.5.2 For site inspections the Bidders may submit written requests to the following nodal officers who would facilitate such visits. Bidder may contact project coordinators in case of any difficulty.

<table>
<thead>
<tr>
<th>Location</th>
<th>Name &amp; Contact Address of IRCTC Nodal officer</th>
</tr>
</thead>
</table>
| Overall Project Coordinator | Mr. Siya Ram  
GGM/Rail Neer Projects,  
11th Floor, A-Wing, Statesman House, Barakhamba Road Connaught Place, New Delhi - 110 001  
Tele Fax No. -23701186  
Mob: 97176 40451  
Email : sivaram4724@irctc.com |
| Mandideep (near Bhopal)   | Mr. Naveen Arora  
DGM /Catering Services,  
Bhopal Regional Office,  
1Ind Floor, Bank of India Building, Arera Hills, Bhopal – 462004  
Mob: 9109181690  
Email : naveenarora@irctc.com |
<table>
<thead>
<tr>
<th>Location</th>
<th>Contact Person</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanand-II (near Ahmedabad)</td>
<td>Mr. Anil Goyal, Manager/CS</td>
<td>5th Floor, Pelican Building, Gujarat Chamber of Commerce &amp; Industry, Ashram Road, Ahmedabad – 380009 Mob: 7600099040 Email: <a href="mailto:anil.goyal@irctc.com">anil.goyal@irctc.com</a></td>
</tr>
<tr>
<td>Bhusawal, Jagi Road (near Guwahati)</td>
<td>Mr. N. K. Pipil, JGM (Rail Neer)/West Zone, Zonal office, New Administrative Building, IIInd floor, Central Railway, CST Mumbai – 400001 Mob: 9004082819 Email: <a href="mailto:nkpipil@irctc.com">nkpipil@irctc.com</a></td>
<td></td>
</tr>
<tr>
<td>Jagi Road (near Guwahati)</td>
<td>Mr. P.K.Dutta, RM/Guwahati</td>
<td>4-D, Mandovi Apartments, In front of Ravindra Bhawan, GNB Road, Ambari, Guwahati, Assam -781001 Mob: 9957644151</td>
</tr>
<tr>
<td>Mallavalli (near Vijayawada)</td>
<td>Mr. N.D. Bhujiang Rao, DGM/IRCTC</td>
<td>Area Manager’s Office, IRCTC, 2nd Floor, Railway Station Main Building, Opp. New Retiring Rooms, Platform No. 1, Vijayawada Railway Station, Vijayawada-520001 Mob: 9701360615 Email : <a href="mailto:ndbrao1998@irctc.com">ndbrao1998@irctc.com</a></td>
</tr>
<tr>
<td>Ranchi</td>
<td>Mr. Zubraj Minz, Area Manager/IRCTC, Tatanagar</td>
<td>94/2, Railway Colony Adityapur, Jamshedpur Mob : 9771440003 Email: <a href="mailto:zminz4774@irctc.com">zminz4774@irctc.com</a></td>
</tr>
<tr>
<td>Maneri - Dist. Mandla (near Jabalpur)</td>
<td>Mr Bahadur Singh Kaushal, AM/Catering</td>
<td>IRCTC Area Office, near general ticket counter, Platform no. 1, Railway Station, Jabalpur. Mob: 9630098908</td>
</tr>
</tbody>
</table>
2.5.3 It shall be deemed that by submitting a Bid, the Bidder has:

(a) made a complete and careful examination of the Bidding Documents;
(b) received all relevant information requested from IRCTC;
(c) accepted the risk of inadequacy, error or mistake in the information provided in the Bidding Documents or furnished by or on behalf of IRCTC relating to any of the matters referred to in Clause 2.5.1 above;
(d) satisfied itself about all matters, things and information including matters referred to in Clause 2.5.1 hereinabove necessary and required for submitting an informed Bid, execution of the Project in accordance with the Bidding Documents and performance of all of its obligations there under;
(e) acknowledged and agreed that inadequacy, lack of completeness or incorrectness of information provided in the Bidding Documents or ignorance of any of the matters referred to in Clause 2.5.1 hereinabove shall not be a basis for any claim for compensation, damages, extension of time for performance of its obligations, loss of profits etc. from IRCTC, or a ground for termination of the Contract Agreement by the Operator;
(f) acknowledged that it does not have a Conflict of Interest; and
(g) agreed to be bound by the undertakings provided by it under and in terms hereof.

2.5.4 IRCTC shall not be liable for any omission, mistake or error in respect of any of the above or on account of any matter or thing arising out of or concerning or relating to Tender Document, the Bidding Documents or the Bidding Process, including any error or mistake therein or in any information or data provided by IRCTC.

2.6 Verification and Disqualification of bids

2.6.1 IRCTC reserves the right to verify all statements, information and documents submitted by the Bidder in response to the TENDER DOCUMENT or the Bidding Documents and the Bidder shall, when so required by IRCTC, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification by IRCTC shall not relieve the Bidder of its obligations or liabilities hereunder nor will it affect any rights of IRCTC thereunder.

2.6.2 Without prejudice to Clause 2.20, IRCTC reserves the right to reject any Bid and appropriate the Bid Security if:

(a) At any time, a material misrepresentation is made or uncovered, or
(b) The Bidder does not provide, within the time specified by IRCTC, the supplemental information sought by them for evaluation of the Bid.
(c) Such misrepresentation/improper response shall lead to the disqualification of the Bidder. If the Bidder is a Consortium, then the entire Consortium and each Member may be disqualified/rejected. If such disqualification/rejection occurs after the Bids have been opened and the Successful Bidder gets disqualified/rejected, then IRCTC reserves the right to invite a Bidder as per process discussed in Clause 3.6.
2.6.3 In case it is found during the evaluation or at any time before signing of the Contract Agreement or after their execution and during the period of subsistence thereof, including the Contract thereby granted by IRCTC, that one or more of the qualification conditions have not been met by the Bidder, or the Bidder has made material misrepresentation or has given any materially incorrect or false information, the Bidder shall be disqualified forthwith if not yet appointed as the DCO either by issue of the LoA or entering into of the Contract Agreement, and if the Successful Bidder has already been issued the LoA or has entered into the Contract Agreement, as the case may be, the same shall, notwithstanding anything to the contrary contained therein or in this Tender Document, be liable to be terminated, by a communication in writing by IRCTC to the successful Bidder or the Operator, as the case may be, without IRCTC being liable in any manner whatsoever to the Successful Bidder. In such an event, IRCTC shall be entitled to forfeit and appropriate the Bid Security or Performance Security, as the case may be, as liquidated damages, without prejudice to any other right or remedy that may be available to it under the Bidding Documents and/or the Contract Agreement, or otherwise.

2.6.4 The Bidder acknowledges and agrees that provisions of this Tender Document which by their nature or subject matter are intended to survive the completion of the Bidding or to apply throughout the Contract Period shall continue to survive and bind the Bidders throughout the Contract Period.

2B DOCUMENTS

2.7 Contents of the Tender Document

2.7.1 This Tender Document comprises the disclaimer set forth hereinabove, the contents as listed below, and will additionally include any Addenda issued in accordance with Clause 2.9 and any clarifications and interpretations issued in accordance with Clause 2.8.

**Invitation for Bids**
Chapter 1: Introduction
Chapter 2: Instructions to Bidders
Chapter 3: Evaluation of Bids
Chapter 4: Pre Bid Conference
Chapter 5: Payment schedule to set up the plants
Chapter 6: Scope of work & technical specifications
Chapter 7: Estimated demand for Rail Neer Plant
Chapter 8: Performance Security
Chapter 9: Price Variation Clause Section
Chapter 10: Arbitration Clause
Chapter 11: Fraud & Corrupt Practices

**Appendices**
I. Qualification
II. Power of Attorney for signing of Bid
III. Power of Attorney for Lead Member of Consortium  
IV. Joint Bidding Agreement for Consortium  
V. Financial Proposal  
Chapter 12: Project Information Memorandum  
Chapter 13: Detailed Technical Specifications  
Chapter 14: Water supply, internal sanitary installation and drainage work  
Chapter 15: Technical Specifications & Standards of buildings  
Chapter 16: Electrical specifications  
Chapter 17: Technical specifications for 33 or 22 or 11 KV electrical sub-stations  
Chapter 18: Technical specifications for safe earthing arrangements  
Chapter 19: Approved brands and makes of material  
Chapter 20: Technical specifications for fire fighting system  
Chapter 21: Technical specifications of machines  
Chapter 22: Integrity Pact  
Chapter 23: Draft Contract Agreement  

2.8 Clarification  

2.8.1 Bidders requiring any clarification on the Tender Document may notify IRCTC in writing in accordance with Clause 1.2.9. Bidders should send in their queries on or before the date mentioned in the Schedule of Bidding Process specified in Clause  

2.8.2 IRCTC shall endeavour to respond to the questions raised or clarifications sought by the Bidders. The responses shall be uploaded in the website of IRCTC. However, IRCTC reserves the right not to respond to any question or provide any clarification, in its sole discretion, and nothing in this Clause shall be taken or read as compelling or requiring IRCTC to respond to any question or to provide any clarification including within any specified time limit. All the queries and its responses thereto, shall be hoisted on the website of IRCTC without identifying the source of queries.  

2.8.3 IRCTC may also on its own motion, if deemed necessary, issue interpretations and clarifications to all Bidders. All clarifications and interpretations issued shall be deemed to be part of the Bidding Documents.  

2.8.4 Save and except as provided in this Tender Document, IRCTC shall not entertain any correspondence with any Bidder in relation to acceptance or rejection of any Bid.  

2.9 Amendment of Tender Document  

2.9.1 At any time prior to the Bid Due Date, IRCTC may, for any reason, whether at its own initiative or in response to clarifications requested by a Bidder, modify the Tender Document by the issuance of an addendum to the Tender Document.  

2.9.2 Any addendum issued hereunder will be published in the websites of IRCTC & CPP only and in no news papers. Any claims for not having access to any addendum issued on website will not be entertained.  

2.9.3 In order to afford the Bidders a reasonable time for taking an addendum into account, or for any other reason, IRCTC may, in its sole discretion, extend the Bid Due Date.
2C PREPARATION AND SUBMISSION OF BIDS:

2.10 **Language of the Bid**

2.10.1 The Bid and all related correspondence and documents in relation to the Bidding Process shall be in English language. Supporting documents and printed literature furnished by the Bid with the Bidder may be in any other language provided that they are accompanied by translations of all the pertinent passages in the English language, duly authenticated and certified by the Bidder. Supporting materials, which are not translated into English, may not be considered. For the purpose of interpretation and evaluation of the Bidder, the English language translation shall prevail.

2.11 **Format and signing of Bid**

2.11.1 The Bidder shall provide all the information sought under this Tender Document. IRCTC will evaluate only those Bids that are received in the required formats and complete in all respects. Incomplete and/or conditional Bids shall be liable to rejection.

2.11.2 The Bid shall be typed or written in indelible ink and signed by the authorized signatory of the Bidder who shall also **initial each page, in blue ink and put its stamp.** All the alterations, omissions, additions or any other amendments made to the Bid shall be initialed by the person(s) signing the Bid.

2.11.3 For Envelope 1 Qualification: The Bidder shall prepare 1 (one) original set of the Qualification (together with originals/ copies of documents required to be submitted along therewith pursuant to this Tender Document and clearly marked "ORIGINAl". as per clause 2.12.1(i).

2.11.4 For Envelope 2 Financial Proposal: The bidder shall prepare 1 (one) **original** set in the format specified in this Tender Document as per clause 2.12.1(ii). **Separate sealed envelopes** are to be submitted for each Project for which the bidder is submitting its Bid.

2.11.5 The two envelopes (Envelope 1 & Envelope 2) shall be then put in a single larger outer envelope.

2.12 **Contents, Sealing and marking of bids**

2.12.1 The Bid shall be submitted in two parts consisting of the following:

i. **Envelope 1:** Qualification (This envelope should be marked:

   "ENVELOPE 1: QUALIFICATION FOR RAIL NEER PACKAGED DRINKING WATER PLANT AT [mention location]"

   (a) Bid in the prescribed format (Appendix-I) along with Annexure and supporting documents as per Annexure-VI;

   ii. **Envelope 2:** Financial Proposal (This envelope should be clearly marked as

      "ENVELOPE 2: FINANCIAL PROPOSAL FOR RAIL NEER PACKAGED DRINKING WATER PLANT AT [mention location]"

   19
Separate Envelope-2 has to be submitted for each location

2.12.2 Deleted.

2.12.3 The two envelopes (more if multiple Envelope-2 are being submitted) shall be put in a larger outer envelope and sealed properly. The outer envelope should be marked as follows:

"TENDER DOCUMENT Proposal: Selection of Developer-cum-Operator for setting up of ‘Rail Neer’ Packaged Drinking Water Plant concerning Tender No. ____________

and shall clearly indicate the name and address of the Bidder. In addition, the Bid Due Date should be indicated on the right hand corner of each of the envelopes.

2.12.4 Each of the envelopes shall be addressed to:

DESIGNATION: Group General Manager - Rail Neer Projects (IRCTC)
ADDRESS: 11th Floor, A-Wing, Statesman House,
148, Barakhamba Road, Connaught Place,
New Delhi-110 001

2.12.5 If the envelopes are not sealed and marked as instructed above, IRCTC assumes no responsibility for the misplacement or premature opening of the contents of the Bid and consequent losses, if any, suffered by the Bidder.

2.12.6 Bids submitted by fax, telex, telegram or e-mail shall not be entertained and shall be rejected.

2.13 Bid Due Date

2.13.1 Bids should be submitted upto 1500 hours IST on the Bid Due Date, at the address provided in Clause 2.12.4 in the manner and form as detailed in this Tender Document. A receipt thereof should be obtained from the person specified in Clause 2.12.4.

2.13.2 IRCTC may, in its sole discretion, extend the Bid Due Date by issuing an Addendum in accordance with this Tender Document uniformly for all Bidders.

2.14 Late Bids

2.14.1 Bids received by IRCTC after the specified time on the Bids Due Date shall not be eligible for consideration and shall be summarily rejected.

2.15 Modifications/substitution/ withdrawal of bids

2.15.1 No modification/substitution/withdrawal of bids is allowed after it has been submitted.

2.16 Rejection of Bids

2.16.1 Notwithstanding anything contained in this Tender Document, IRCTC reserves the
right to reject any Bid and to annul the Bidding Process and reject all Bids at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons therefore. In the event that IRCTC rejects or annuls all the Bids, it may, in its discretion, invite all eligible Bidders to submit fresh Bids hereunder.

2.16.2 IRCTC reserves the right not to proceed with the Bidding Process or to modify the Bidding Process at any time, without notice or liability, and to reject any Bid without assigning any reasons.

2.17 Validity of Bids

2.17.1 The Bids shall be valid for a period of not less than 120 (one hundred and twenty) days from the Bid Due Date. The validity of Bids may be extended by mutual consent of the respective Bidders and IRCTC.

2.18 Confidentiality

2.18.1 Information relating to the examination, clarification, evaluation, and recommendation for the bidders shall not be disclosed to any person who is not officially concerned with the process or is not a retained professional advisor advising IRCTC in relation to, or matters arising out of, or concerning the Bidding Process. IRCTC will treat all information, submitted as part of Bid, in confidence and will require all those who have access to such material to treat the same in confidence. IRCTC may not divulge any such information unless it is directed to do so by any statutory entity that has the power under law to require its disclosure or is to enforce or assert any right or privilege of the statutory entity and/or IRCTC or as may be required by law or in connection with any legal process.

2.19 Proprietary data

2.19.1 All documents and other information supplied by IRCTC or submitted by a Bidder to IRCTC shall remain or become the property of IRCTC. Bidders are to treat all information as strictly confidential and shall not use it for any purpose other than for preparation and submission of their Bid. IRCTC will not return any Bid or any information provided along therewith.

2D BID SECURITY

2.20 Bid Security

2.20.1 Bid Security as referred to in clause 1.2.6 here in above should be in the form of a demand draft issued by a Scheduled Bank in India, drawn in favour of the “Indian Railway Catering & Tourism Corporation” payable at New Delhi. IRCTC shall not be liable to pay any interest on the Bid Security deposit so made and the same shall be interest free. For the avoidance of doubt, Scheduled Bank shall mean a bank as
defined under Section 2(e) of the Reserve Bank of India Act, 1934, (the “Scheduled Bank”)

2.20.2 Any Bid not accompanied by the Bid Security shall be summarily rejected as non-responsive. There are no contracts or waivers in Bid Security for any type of bidder.

2.20.3 The Bid Security of unsuccessful Bidders will be returned, without any interest, as promptly as possible after execution of the Contract Agreement by the Successful Bidder or when the Bidding Process is cancelled.

2.20.4 The Successful Bidder’s Bid Security will be returned, without any interest, upon the bidder signing the Contract Agreement and furnishing the Performance Security. The Successful Bidder shall extend the validity period of its Bid Security so as for it to be available until the execution of the Contract Agreement.

2.20.5 IRCTC shall be entitled to forfeit and appropriate the Bid Security as liquidated damages inter alia in any of the events specified in Clause 2.20.7 herein below and pursuant to other provisions of this Tender Document providing for a forfeiture of Bid Security. The Bidder, by submitting its Bid pursuant to this Tender Document, shall be deemed to have acknowledged and confirmed that IRCTC will suffer loss and damage on account of withdrawal of its Bid or for any other default by the Bidder during the period of Bid validity as specified in this Tender Document. No relaxation of any kind on Bid Security shall be given to any Bidder.

2.20.6 The Bid Security shall be forfeited as liquidated damages without prejudice to any other right or remedy that may be available to IRCTC under the Bidding Documents and/ or under the Contract Agreement, or otherwise, under the following conditions:

(a) If a Bidder engages in a corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice as specified in Section 11 of this Tender Document;

(b) If a Bidder modifies or substitutes (without the prior written approval of IRCTC) or withdraws its Bid during the period of Bid validity as specified in this Tender Document and as extended in accordance with the terms of the Bidding Documents; or

(c) In the case of Successful Bidder, if within the specified time limit –

i. It fails to sign and return the duplicate copy of LOA;

ii. It fails to incorporate the SPV or such SPV fails or refuses to sign the Contract Agreement;

iii. The SPV fails to provide the Performance Security in accordance with the Bidding Document;

iv. It fails or refuses to extend the validity of the Bid or the Bid Security as required by the Bidding Documents; or

v. The successful Bidder fails or refuses to provide any documents required to be provided by it after its selection.
3. EVALUATION OF BIDS

3.1 Opening and Evaluation of Bids

3.1.1 IRCTC shall open the Envelope 1: Qualification at 1530 hours on the Bid Due Date, at the place specified in Clause 2.12.4, unless otherwise notified, and in the presence of the Bidders who choose to attend.

3.1.2 IRCTC will subsequently examine and evaluate the Bids in accordance with the provisions set out in this Section 3.

3.1.3 Bidders are advised that selection of Bidders will be strictly as provided herein. Bidders will be deemed to have understood and agreed that no explanation or justification on any aspect of the Bidding Process or disqualification or selection will be given.

3.1.4 Any information contained in the Bid shall not in any way be construed as binding on IRCTC, its agents, successors or assigns, but shall be binding against the Bidder if the Project is subsequently awarded to it on the basis of such information.

3.1.5 IRCTC reserves the right not to proceed with the Bidding Process at any time without notice or liability and to reject any or all Bid(s) without assigning any reasons.

3.1.6 If any information furnished by the Bidder is found to be incomplete, or contained in formats other than those specified herein, IRCTC may, in its sole discretion, exclude the relevant project from computation of the Eligible Experience of the Bidder.

3.1.7 In the event that a Bidder claims credit for an Eligible Project, and such claim is determined by IRCTC as incorrect or erroneous, IRCTC shall reject such claim and exclude the same from computation of the Eligible Experience. Where any information is found to be patently false or amounting to a material misrepresentation, IRCTC reserves the right to reject the Bid in accordance with the provisions of Clause 3.4.

3.2 Test of responsiveness

3.2.1 Prior to evaluation of bids, IRCTC shall determine whether each Bid is responsive to the requirements of the Tender Document. A Bid shall be considered responsive only if:

(a) It is received as per format at Appendix-I and Appendix-V along with all the Annexes and related documents;

(b) It is received by the Bid Due Date including any extension thereof pursuant to Clause 2.13.2;

(c) It contains all the documents (complete in all respect) as per the Annexure-VI of Appendix-I.

(d) It is signed, sealed and marked as stipulated in Clause 2.12

(e) It does not contain any condition or qualification; and

(f) It is not non-responsive in terms hereof.

3.2.2 IRCTC reserves the right to reject any Bid which is non-responsive and no request for alteration, modification, substitution or withdrawal shall be entertained by IRCTC in respect of such Bid.
3.3 Evaluation of Bids

3.3.1 Subject to the provisions of Clause 2.1 and 2.16, the Bidder whose Bid is adjudged as responsive in terms of Clause 3.2; has qualified in terms of clause 3.4; and has quoted the lowest combined rate per bottle shall be declared as the successful Bidder (the Successful Bidder”). In the event that IRCTC rejects or annuls all the Bids, it may, in its discretion, invite fresh Bids.

3.3.2 The evaluation of Bids shall be undertaken in the following sequence:

1. Evaluation of Envelope 1: Qualification;
2. Evaluation of Envelope 2: Financial Proposal
3.4 Evaluation of Envelope 1: Qualification

3.4.1 In the event the Bidder is applying for more than one Project, the Bidder shall satisfy on the Financial Capacity criteria for each project individually. A Bidder who qualifies on the Threshold Technical Capacity may bid for one or more projects under this Tender Document. Overall, eligibility under provisions of Clause 3.4.2 shall be reckoned as requisite Technical Capacity to qualify as eligible experience (the “Eligible Experience”) in relation to eligible projects (the “Eligible Projects”).

3.4.2 Technical eligibility criteria for opening of financial bids:

A. **Technical Capacity:** For demonstrating technical capacity and experience (the "Threshold Technical Capacity"), the BIDDER shall, over the past 3 (three) financial years (2014-15, 2015-16 and 2016-17) preceding the Bid Due Date, have:

*Category 1:* Operated and maintained at least 1 (one) fully automatic packaged drinking water bottling plant based on Reverse Osmosis technology (or Superior technology); OR 1 (one) fully automatic Natural Mineral Water bottling plant either as owner of the plant or as franchisee or as O&M contractor;

OR

*Category 2:* Operated and maintained at least 1 (one) fully automatic Carbonated Soft Drink (CSD) bottling plant or fruit beverage packaging plant using Reverse Osmosis technology or superior technology either as owner of the plant or franchisee or as O&M operator;

OR

*Category 3:* Supplied, erected and commissioned at least 3 (three) numbers of fully automatic packaged drinking water plant / CSD plant / fruit beverage plant comprising of bottling plant and water treatment plant based on Reverse Osmosis technology as part of a turn-key construction contract /Engineering, Procurement and Construction (“EPC”) contract for a project in the last 3 (three) financial years preceding the Bid Due Date.

In case of consortium, maximum number of partners may be four (4). The lead partner shall have minimum 51% stake in this consortium. At least one of the partners should qualify eligibility criteria as mentioned above and should have minimum 26% stake.

In case of Category 1 as mentioned in clause 3.4.2, the average annual production must not have been less than **75 lakh litres per annum** in the last three financial years from one of the above mentioned plants. (Production of water in 5 litres and more than 5 litres containers will not be considered for calculation of average annual production)

In case of Category 2 as mentioned in clause 3.4.2, the average annual production must not have been less than **75 lakh litres per annum** in the last three financial years
from one of the above mentioned plants.

In case of Category 1, 2 & 3 as mentioned in clause 3.4.2, the capacity of the fully automatic bottling plant, should not be less than 60 Bottles Per Minute (BPM) in single line i.e. consisting of at least one blowing machine and one filling machine of capacity not less than 60 BPM.

In case of PDW or natural mineral water, the plant must have been operational under norms and procedures prescribed by Bureau of Indian Standards (IS 14543:2004/ IS 13428:2005) with a fully automatic bottling line for PET bottles.

In case of CSD, the plant must have been operational under norms and procedures prescribed by Fruit Product Order (FPO) Act of 1955 and Bureau of Indian Standards (IS 2346:1992) with fully automatic bottling/packing line for PET bottles.

The Automatic plant referred above shall consist of automatic blowing, filling and labeling machines and there is no human contact in blowing, transfer and filling operation.

**B. Financial Capacity:** For each project that the bidder wishes to qualify for, the bidder shall have

1. A minimum Networth of Rs. 5 crore (Rupees five Crore) as on 31.03.17
2. A minimum total turnover of Rs. 20 Crore (Rupees Thirty Crore) during last three financial years (2014-15, 2015-16, 2016-17)

(Note: In case of consortium, minimum networth and turnover of lead member and second highest shareholding consortium member should not be less than 51% & 26% respectively of the above minimum requirement)

**In case of a Consortium, the combined technical capacity and financial of those Members,** who have and shall continue to have an equity share of at least 26% (twenty six per cent) each in the SPV, should satisfy the above conditions of eligibility; provided that each such Member shall, for a period of 5 (five) years from the date of commercial operation of the Project, hold equity share capital not less than: (i) 26% (twenty six per cent) of the subscribed and paid up equity of the SPV; and (ii) 5% (five per cent) of the Total Project Cost specified in the Agreement.

3.4.3 A Bidder who qualifies on the Threshold Technical Capacity may bid for one or more Projects under this Tender Document. In the event the Bidder is applying for more than one Project, the Bidder shall satisfy on the Financial Capacity criteria for each project. **For the sake of clarity, for example:** If the bidder wishes to qualify for two projects the total financial capacity required by the bidder would be:

(a) A minimum Networth of Rs. 10 crore (Rupees Ten Crore) at the close of the
financial year preceding the Bid Due Date.
(b) A minimum total turnover of Rs. 40 Crore (Rupees Forty Crore) during last three financial years.

3.4.4 The Bidder shall enclose with its Bid, to be submitted as per the format at Appendix- I, complete with its Annexures, all the documents as per Annexure-VI of Appendix-I

(a) Deleted.
(b) Certificate(s) from its Chartered Accountant specifying the net worth of the Bidder, as at the close of the preceding financial year, and also specifying that the methodology adopted for calculating such net worth conforms to the provisions of this Clause. For the purposes of this Tender Document, net worth (the "Net Worth") shall mean the sum of subscribed and paid up equity and reserves from which shall be deducted the sum of revaluation reserves, miscellaneous expenditure not written off and reserves not available for distribution to equity share holders.

3.4.5 The Bidder should submit a Power of Attorney as per the format at Appendix- II, authorizing the signatory of the Bid to commit the Bidder. In the case of a Consortium, all the Members should submit a Power of Attorney in favour of the Lead Member as per format at Appendix-III.

3.4.6 Where the Bidder is a single entity, it may be required to form an appropriate Special Purpose Vehicle, incorporated under the Indian Companies Act, 2013 (the "SPV"), to execute the Agreement and implement the Project. In case the Bidder is a Consortium, it shall, in addition to forming an SPV, comply with the following additional requirements:

(a) Number of members in a consortium shall not exceed 4 (four), but information sought in the Bidder may be restricted to 2 (two) largest members in the order of their equity contribution;
(b) Subject to the provisions of sub-clause (a) above, the Bidder should contain the information required for each member of the Consortium;
(c) Members of the Consortium shall nominate one member as the lead member (the "Lead Member"), who shall have an equity share holding of at least 51% (fifty one per cent) of the paid up and subscribed equity of the SPV. The nomination(s) shall be supported by a Power of Attorney, as per the format at Appendix-III, signed by all the other members of the Consortium;
(d) The Bidder should include a brief description of the roles and responsibilities of individual members, particularly with reference to financial, technical and O&M obligations;
(e) An individual Bidder cannot at the same time be member of a Consortium applying for qualification. Further, a member of a particular Bidder Consortium cannot be member of any other Bidder Consortium applying for qualification;
(f) The members of a Consortium shall form an appropriate SPV to execute the Project, if awarded to the Consortium;
(g) Members of the Consortium shall enter into a binding Joint Bidding Agreement,
substantially in the form specified at Appendix-IV (the "Joint Bidding Agreement"), for
the purpose of making the Bid and submitting a Bid. The Joint Bidding Agreement, to
be submitted along with the Bid, shall, inter alia:

i. convey the intent to form an SPV with shareholding/ownership equity
commitment(s) in accordance with this Tender Document, which would enter
into the Agreement and subsequently perform all the obligations of the DCO in
terms of the Agreement, in case the contract to undertake the Project is awarded
to the Consortium;

ii. Clearly outline the proposed roles and responsibilities, if any, of each member;

iii. Commit the minimum equity stake to be held by each member;

iv. Commit that each of the members, whose experience will be evaluated
for the purposes of this Tender Document, shall subscribe to 26% (twenty
six per cent) or more of the paid up and subscribed equity of the SPV and
shall further commit that each such member shall, for a period of 5 (five) years
from the date of commercial operation of the Project, hold equity share capital
not less than: (i) 26% (twenty six per cent) of the subscribed and paid up
equity share capital of the SPV; and (ii) 5% (five per cent) of the Total Project
Cost specified in the Agreement;

v. Commit that the Lead Member shall, upon constitution of the SPV, subscribe to
51% (fifty one per cent) or more of the paid up and subscribed equity of the
SPV at all times of the commercial operation date of the Project;

vi. Members of the Consortium undertake that they shall collectively hold at least
51% (fifty one per cent) of the subscribed and paid up equity of the SPV at all
times until the fifth anniversary of the commercial operation date of the Project;
and

vii. Include a statement to the effect that all members of the Consortium shall be
liable jointly and severally for all obligations of the DCO in relation to the
Project until the Financial Close of the Project is achieved in accordance with the
Agreement; and

viii. Except as provided under this Tender Document and the Bid Documents, there
shall not be any amendment to the Joint Bidding Agreement without the prior
written consent of IRCTC.

3.4.7 Any entity which has been barred by the Central/ State Government, or any entity
controlled by it, from participating in any project, and the bar subsists as on the date of
Bid, would not be eligible to submit any Bid, either individually or as member of a
Consortium. The bidders will have to give a declaration to this effect.

3.4.8 A Bidder including any Consortium Member or Associate should, in the last 3
(three) years, have neither failed to perform on any contract, as evidenced by imposition
of a penalty by an arbitral or judicial authority or a judicial pronouncement or
arbitration award against the Bid, Consortium Member or Associate, as the case may
be, nor has been expelled from any project or contract by any public entity nor have
had any contract terminated any public entity for breach by such Bid, Consortium
Member or Associate. The bidders will have to give a declaration to this effect.

3.4.9 In computing the Technical Capacity and Financial Capacity of the Bidder/ Consortium
Members under Clause 3.4 the Technical Capacity and Financial Capacity of their respective Associates would also be eligible hereunder.

For purposes of this Tender Document, Associate means, in relation to the Bid/Consortium Member, a person who controls, is controlled by, or is under the common control with such Bidder/Consortium Member (the "Associate"). As used in this definition, the expression "control" means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person by operation of law.

3.4.10 The following conditions shall be adhered to while submitting a Bid:

(a) Bid should attach clearly marked and referenced continuation sheets in the event that the space provided in the prescribed forms in the Annexes is insufficient. Alternatively, Bidder may format the prescribed forms making due provision for incorporation of the requested information;

(b) In responding to the bid submissions, Bidders should demonstrate their capabilities in accordance with Clause 3.3; and

(c) In case the Bidder is a Consortium, each Member should substantially satisfy the qualification requirements to the extent specified herein.

3.4.11 While Qualification is open to persons from any country, the following provisions shall apply:

(a) Where, on the date of the bid, not less than 15% (fifteen per cent) of the aggregate issued, subscribed and paid up equity share capital in an bid or its Member is held by persons resident outside India or where an bid or its Member is controlled by persons resident outside India; or

(b) if at any subsequent stage after the date of the bid, there is an acquisition of not less than 15% (fifteen per cent) of the aggregate issued, subscribed and paid up equity share capital or control, by persons resident outside India, in or of the bidder or its Member;

Then the Qualification of such bidder or in the event described in sub clause (b) above, the continued Qualification of the bidder shall be subject to approval of IRCTC from national security and public interest perspective. The decision of IRCTC in this behalf shall be final and conclusive and binding on the bidder.

The holding or acquisition of equity or control, as above, shall include direct or indirect holding/ acquisition, including by transfer, of the direct or indirect legal or beneficial ownership or control, by persons acting for themselves or in concert and in determining such holding or acquisition, IRCTC shall be guided by the principles, precedents and definitions contained in the Securities and Exchange Board of India (Substantial Acquisition of Shares and Takeovers) Regulations, 1997, or any substitute thereof, as in force on the date of such acquisition.

The bidder shall promptly inform IRCTC of any change in the shareholding, as above, and failure to do so shall render the bidder liable for disqualification from the
Bidding Process.

3.4.12 **Details of Experience:**

(a) The Bidder should furnish the details of Eligible Experience for the last 3 (three) financial years.
(b) The Bidder must provide the necessary information relating to Technical Capacity as per format at Annex-II of Appendix-I.
(c) The Bidder should furnish the required project-specific information and evidence in support of its claim of Technical Capacity, as per format at Annex-IV of Appendix-I.
(d) In case the annual accounts for the latest financial year are not audited and therefore the Bidder cannot make it available, the Bidder shall give an undertaking to this effect and the statutory auditor shall certify the same. In such a case, the Bidder shall provide the Audited Annual Reports for 3 (three) years preceding the year for which the Audited Annual Report is not being provided.

3.4.13 Notwithstanding anything to the contrary contained herein, in the event that the Bid Due Date falls within three months of the closing of the latest financial year of an bidder, it shall ignore such financial year for the purposes of its bid and furnish all its information and certification with reference to the 3 (three) years, preceding its latest financial year. For the avoidance of doubt, financial year shall, for the purposes of this bid hereunder, mean the accounting year followed by the bidder in the course of its normal business.

3.4.14 Experience for any activity relating to an Eligible Project shall not be claimed by two or more Members of the Consortium. In other words, no double counting by a Consortium in respect of the same experience shall be permitted in any manner whatsoever.

3.4.15 All the conditions of GST will be applicable instead of erstwhile Taxation laws. The bidder should be registered under GST and also he should not opt for composite scheme under GST. **Documentary proof of GST registration is required to be submitted in this regard.**

“Moreover, any loss occurred to IRCTC on account of non-availing of input tax credit (ITC) due to the lapses/fault on the part of the contractor will be compensated by the contractor to IRCTC.”

3.5 **Evaluation of Envelope 2: Financial Proposal**

3.5.1 The Financial Proposal evaluation seeks to select the Bidder offering the best commercial terms. The information requirements and guidelines for submission of the Financial Proposal are detailed in Appendix V of this Tender Document. The Bidder is to submit the Envelope 2: Financial Proposal as per the format in Appendix V.

3.5.2 Financial Proposals of only those bidders who meet the Qualification criteria as per clause 3.4 shall be evaluated in this stage. Bids that do not meet these criteria shall be
rejected and their bid security would be returned and financial bid of unsuccessful bidders will be returned unopened.

3.5.3 The Financial Proposals of Bidders would be evaluated on the basis of the lowest total price per one litre bottle payable by IRCTC in the first year of Operation Period after Commercial Operations Date (COD).

3.5.4 Bidders are requested to note that the total price per bottle quoted in the financial proposal shall not have any conditionality attached or deviations from the contract Agreements or Tender Document. **Bids with conditions attached shall be treated as non-responsive.**

3.5.5 For the purposes of the financial proposal the bidders are required to quote (A) Rate per one litre bottle for manufacturing of Rail Neer packaged drinking water (B) Cost of distribution per one litre bottle.

3.5.6 The bidder quoting the least Total Price per bottle would be declared as the lowest bidder for each location.

3.6 **Selection of bidder**

3.6.1 The Bidder adjudged as responsive in terms of Clause 3.2 and quoting the lowest bid as per Clause 3.5 shall be declared as the selected Bidder (the “Selected Bidder”).

3.6.2 The Second and Third lowest Bidders in each location shall be kept in reserve and may, in accordance with the process specified in the Tender Document, be considered in case the Lowest Bidder withdraws or is not selected for any reason.

3.6.3 In the event that two or more Bidders quote the same amount as the case may be (the "Tie Bidders"), IRCTC shall identify the Selected Bidder by highest net worth in the last financial year as indicated in para3.4.2B which shall be conducted, with prior notice, in the presence of the Tie Bidders who choose to attend.

3.6.4 After acknowledgement of the LOA as aforesaid by the Selected Bidder, it shall execute the Contract Agreement within the period prescribed. The Selected Bidder shall not be entitled to seek any deviation in the Contract Agreement.

3.6.5 After the acceptance of the LOA, the Successful Bidder shall incorporate a special purpose company specifically formed and incorporated in India only for the purpose of undertaking the Project pursuant to the Contract Agreement (“SPC” or the "Special Purpose Company") as a limited liability company under the Companies Act 2013. In case bidder has already formed SPV for previously allotted locations there is no need for formation of new SPV. The Successful Bidder shall ensure that the Special Purpose Company is incorporated and capitalized within thirty (30) days from the date of issue of the LOA and promptly upon such incorporation and capitalization provide evidence thereof to IRCTC.

(In the event that the Successful Bidder is a Consortium, the shareholding of the Special Purpose Company shall be owned directly by the Members in accordance in same proportion as the submissions made as under the Joint Bidding Agreement submitted at the Bid stage.)
3.7 Contacts during Bid Evaluation

3.7.1 Bids shall be deemed to be under consideration immediately after they are opened and until such time IRCTC makes official intimation of award/ rejection to the Bidders.

3.7.2 While the Bids are under consideration, Bidders and/ or their representatives or other interested parties are advised to refrain from contacting by any means, IRCTC and/or their employees/ representatives on matters related to the Bids under consideration.
4. PRE BID CONFERENCE

4.1 A Pre-Bid conference for the interested parties shall be convened at IRCTC Ltd, 11th floor, Statesman House, Barakhamba Road, New Delhi – 110001 as updated on the website of IRCTC. A maximum of two representatives of each Bidder shall be allowed to participate on production of authority letter from the Bidder.

4.2 During the course of Pre Bid conference, the Bidders will be free to seek clarifications and make suggestions for consideration of IRCTC. IRCTC shall endeavour to provide clarifications and such further information as it may, in its sole discretion, consider appropriate for facilitating a fair, transparent and competitive Bidding Process.
5. Payment Schedule to set up the plant

IRCTC will be providing funds to the tune of Rs. 8 (Eight) crore (Rs. 5.2 crore for plant & machinery including DG set + Rs. 2.8 crore for civil, electrical and allied works) to set up plant. Rs. 8.00 crore is all inclusive and the contractor will issue tax invoice to IRCTC to claim this amount for enabling IRCTC to avail input tax credit (ITC). The payments will be released at various stages as given below:-

**PART-A (Rs. 5.2 (five point two) crore)**

Payment terms (for Plant & Machinery including DG set) shall be as follows:

(i) 20% of the project cost of plant & machinery against submission of P & ID, Plant plan & equipments layout. BG of equal amount valid for one year is required to be submitted before release of this payment.

(ii) 60% of the project cost of plant and machinery against delivery of major plant and equipments (i.e. blowing, RFC, Labeling, Shrink Packing, Air Compressor, transformer, Panel, DG Set, Chiller, Cooling Tower & DG set etc.).

(iii) 10% of the project cost of plant and machinery against installation of plant and machinery.

(iv) 10% of the project cost of plant and machinery against commissioning and trial run.

**Estimated Weightage for Payment of Plant & Machinery**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Machine/Equipment</th>
<th>% Weightage of Cost of Machine/Equipment etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water Treatment Plant</td>
<td>28</td>
</tr>
<tr>
<td>2</td>
<td>Bottle Blowing Machine, compressor &amp; auxiliaries</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>RFC Machines, conveyers &amp; coding equipments</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Labelling Machines &amp; Conveyers</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Packaging Machines</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Laboratory Equipments</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Electrical Works including DG Set</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>Racking, Pallets, Fork Lift etc.</td>
<td>8</td>
</tr>
</tbody>
</table>

60% payment of percentage weightage as per above table to agency will be made for individual items against proof of delivery duly certified by IRCTC official.
PART-B (Rs. 2.8 (Two point eight) Crore)

Payment terms (for civil, electrical & allied works) shall be as follows:

(i) 10% of the projected cost of civil, electrical & allied works against drawing submission. BG of equal amount valid for one year is required to be submitted before release of this payment.

(ii) 15% of the projected cost of civil, electrical & allied works against soil investigation and filling/leveling of site.

(iii) 15% of the projected cost of civil, electrical & allied works against casting of foundation & plinth.

(iv) 5% of the projected cost of civil, electrical & allied works against sand filling, PCC, RCC flooring works.

(v) 5% of the projected cost of civil, electrical & allied works against brick work upto desired level.

(vi) 10% of the projected cost of civil, electrical & allied works against construction of raw water tank, path ways around building.

(vii) 5% of the projected cost of civil, electrical & allied works against completion of boundary wall.

(viii) 10% of the projected cost of civil, electrical & allied works – electrification inside or outside main building including cabling and installation of electrical control panels

(ix) 10% of the projected cost of civil, electrical & allied works against inside partition, false ceiling, finishing of all plumbing and woodwork and fire protection equipments.

(x) 5% of the projected cost of civil, electrical & allied works against issue of completion certificate of building construction and any other regulatory clearances.

(xi) 10% of the projected cost of civil, electrical & allied works against PEB structure (80% against supply and 20 % against erection).
6. **Scope of Work & Technical Specifications:**

A. Each plant is designed for production of 72000 litre per day with single blowing machine & associated equipment.

B. **Infrastructure:**

1. All civil, electrical including HT substation and allied works
2. Building and infrastructure shall include the provision –

   (a) Laboratory (Chemical & Microbiological)
   (b) Raw material storage room
   (c) O&M store (chemical and spare parts)
   (d) Self life sample store
   (e) Compressor room
   (f) Temperature controlled RFC room
   (g) Blowing & Packaging room/hall
   (h) Office for DCO & IRCTC staff
   (i) Room for Security & CFA staff
   (j) Storage room for quality rejection & processed waste material
   (k) Finished good storage area
   (l) Electrical panel/DG room
   (m) Canteen/Pantry
   (n) Separate toilets/change room for workers and officials

3. The PEB covered area – min. 2000 sqm (finished floor level: +0.45 mtr above road level)
5. Rain Water harvesting pits as per requirement of CGWA
6. Fire fighting arrangement as per statutory requirement
7. HT substation - packaged substation of 400 KVA
8. Stacking racks, pallets and Fork Lifts Truck
9. Pump house and raw water storage tank
10. Development of bore wells and pipelines
11. Flooring – VDF, Kota stone, tiling and plain cement concrete flooring
12. False Ceiling, Window, doors, air curtains, ventilation, exhaust as per requirement.
13. White washing, polishing, painting as per requirement
14. Water supply, internal sanitary installation and drainage as per requirement,

Building & Infrastructure to be created as per requirement provided in the tender document.
# C. Plant & Machinery:

Capacity & Specifications of equipments as detailed below:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Description of Equipments</th>
<th>Capacity (Minimum)</th>
<th>Make</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pumps</td>
<td>As per requirement</td>
<td>Grundfos, KSB, Johnson, Kirloskar</td>
</tr>
<tr>
<td>2</td>
<td>Water Treatment Plant</td>
<td>5.0 m³/hr</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Water recycling system</td>
<td>2.5 m³/hr</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Packaged substation complete with Transformer, HT switch gear and LT panel</td>
<td>400 KVA</td>
<td>Transformer-Crompton/Kirloskar/ABB/BHEL</td>
</tr>
<tr>
<td>5</td>
<td>DG SET complete with AMF panel</td>
<td>400 KVA</td>
<td>CG, Cummins, Kirlosker/Catter Piller</td>
</tr>
<tr>
<td>6</td>
<td>Sodium Hypochlorite Dosing</td>
<td>As per requirement</td>
<td>Milton Roy/Johnson/Grundfos</td>
</tr>
<tr>
<td>7</td>
<td>UF membrane</td>
<td>As per requirement</td>
<td>Pentair/Koch</td>
</tr>
<tr>
<td>8</td>
<td>R O membrane</td>
<td>As per requirement</td>
<td>Dow/Hydranautics/Toray</td>
</tr>
<tr>
<td>9</td>
<td>U V System</td>
<td>As per requirement</td>
<td>Alfa/Triogen/Hanovia</td>
</tr>
<tr>
<td>10</td>
<td>Ozonator</td>
<td>30 mg/Hr</td>
<td>Ozonetek, Ozonia</td>
</tr>
<tr>
<td>11</td>
<td>Bottle Blowing Machine with air recovery system</td>
<td>Production output of 4200 BPH for one litre bottle</td>
<td>Sidel, Shyam Plastic, Krones KHS, Sacmi Techlong</td>
</tr>
<tr>
<td>12</td>
<td>Chiller</td>
<td>7 TR</td>
<td>Super, Reynold/Premier</td>
</tr>
<tr>
<td>13</td>
<td>Air Conveyor</td>
<td>as per requirement</td>
<td>Hymech/Hilden/Hiemens/Selvel/ITW/Sattelite/Sacmi/Techlong.</td>
</tr>
<tr>
<td>14</td>
<td>Bottle Filler with Rinser and Capper</td>
<td>90 BPM</td>
<td>Hilda/Hymech/Hilden/Hiemens/KHS/Krones/Sacmi/Techlong.</td>
</tr>
<tr>
<td>15</td>
<td>Pneumatic and Mechanical Conveyor</td>
<td>To meet 120 BPM production capacity</td>
<td>Hymech/Hilden/Hiemens/Selvel/ITW/Sacmi</td>
</tr>
<tr>
<td>16</td>
<td>Bottle Coding M/C (Inkjet Printer)</td>
<td>Min 30 character, 75 BPM</td>
<td>Image/Domino/Baksi Mark (Linx)</td>
</tr>
<tr>
<td>17</td>
<td>Bottle labelling Machine</td>
<td>120 bpm</td>
<td>Hilda/Hymech/Hilden/Hiemens/KHS/Krones/Sacmi/Techlong</td>
</tr>
<tr>
<td>18</td>
<td>Shrink Wrap Packaging M/C</td>
<td>8 CPM</td>
<td>Minipack/Krone/KHS/Sacmi/Techlong</td>
</tr>
<tr>
<td>19</td>
<td>HP Compressor</td>
<td>180 CFM</td>
<td>Ingersoll-Rand, Chicago Pneumatic, Air Francois</td>
</tr>
<tr>
<td>20</td>
<td>L P Compressor with VDF</td>
<td>130 CFM</td>
<td>Ingersoll-Rand, Chicago Pneumatic, Air Francois</td>
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<tr>
<td>21</td>
<td>Cooling Tower</td>
<td>As per matching</td>
<td>Paharpur/Armec.</td>
</tr>
<tr>
<td>No.</td>
<td>Requirement</td>
<td>Requirement</td>
<td>Supplier(s)</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>22</td>
<td>Storage (Racking) Facility</td>
<td>4-5 Days Storage</td>
<td>Godrej/Vinar/Indo Built</td>
</tr>
<tr>
<td>23</td>
<td>Fork Lift – 01 no.</td>
<td>1.5 TR</td>
<td>Godrej/Voltas/Ace</td>
</tr>
<tr>
<td>24</td>
<td>Carton Packing Machine (optional)</td>
<td>8 CPM</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Power Cable</td>
<td>as per drawing</td>
<td>As per chapter technical specification</td>
</tr>
<tr>
<td>26</td>
<td>Electrical Switch Gears</td>
<td>as per requirement</td>
<td>Siemens, ABB, GE, L&amp;T, Havell’s.</td>
</tr>
<tr>
<td>27</td>
<td>Fans &amp; Air circulators</td>
<td>As per requirement</td>
<td>Crompton Greaves, Bajaj, Havell’s, Almonard, Usha.</td>
</tr>
<tr>
<td>28</td>
<td>Air conditioners with inverter technology</td>
<td>As per requirement</td>
<td>Hitachi, Daikin, Panasonic, Carrier</td>
</tr>
<tr>
<td>29</td>
<td>Laboratory equipment</td>
<td>As per IS 14543:2004</td>
<td></td>
</tr>
</tbody>
</table>

D. Other Items:-

i. Office accommodation  
ii. EPBAX, Telephone, CCTV  
iii. Furniture  
iv. Office equipments-computers, printer, photocopier, etc  
v. Internal and External electrification including fixtures  
vi. Fire Protection system  
vii. Sewage treatment plant  
ixii. Bore wells (2 nos.) wherever required

E. Raw Materials:

The PET preform should be 20.0± 0.5 gms, neck size 27 mm Alaska, three start, made from Husky, Krauss Maffei or ASB machines.

The HDPE Cap should be 1.6 ± 0.2 gms suitable for above preform made from Husky, Sacmi and Nestal machines.

The BOPP label (Transparent) should be of 256 (± 5) × 73 (± 1) mm of 38 (± 5%) micron thickness.

The LDPE shrink roll should be of 90 ± 5 micron thickness with shrinkage ratio of 80:20 (± 5%). For packing one carton material required - 1050 ± 50 mm length, 600 ± 25 mm width.

The design of bottle and label will be specified by IRCTC. IRCTC reserves the right to change the specification of materials including design of the bottle and label from time to time giving the DCO adequate notice to implement the said change.
Note:

1. For detail technical specification of all above works, please refer chapter technical specification. In case any item is not covered in these specifications, CPWD specification will be followed. Any deviation in the specification should have prior approval of IRCTC. IRCTC’s prior approval is required for the installation of machines of other makes or machines for which makes are not specified.

2. Vendor may optimize the capacity of plant and machinery. The capacity of plant and machinery specified as above are minimum requirement. Vendor may opt for higher capacity also. No extra payment for higher capacity machine shall be made by IRCTC.

3. The DCO will also provide necessary change parts/modifications required for the manufacture of 500 ml bottle in the same bottling line.

4. Any items left in above list of Plant & Machinery, DCO will supply the same as per BIS requirement.
7. Estimated demand for Rail Neer Plant:

The Likely demand of Rail Neer at various stations to be supplied from the Rail Neer Plant is given in the table below. Bidder may note that these are only tentative figures and likely to change as per actual demand. IRCTC is free to add any new station and delete any existing station. The distance in Kilometers Ex. Plant to the stations for the calculation purpose will be the distance as mentioned on the feasible shortest route in Google maps/Mapmyindia.com

A. Industrial Area, Mandideep, Phase-II, Dist. Raisen (MP)

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<th>Sl. No.</th>
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<th>Demand per day (carton)</th>
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Total 6000
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D. Jagi Road (Near Guwahati)

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**Sub Total** | **5350**
### E. Kotha Mallavalli (near Vijayawada)

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### G. Ranchi

#### Rail Neer Plant, Patratu (near Ranchi)

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</table>
8. PERFORMANCE SECURITY

(Extract from Draft Contract Agreement, References refer to the articles in the contract agreement)

8.1 The DCO shall, for the performance of its obligations hereunder during the Contract Period, no later than 30 (Thirty) days from the date of the Contract Agreement, provide to IRCTC an irrevocable and unconditional guarantee from Scheduled Bank (the “Performance Security”). Until such time the Performance Security is provided by the DCO pursuant hereto and the same comes into effect, the Bid Security shall remain in force and effect, and upon such provision of the Performance Security pursuant hereto, IRCTC shall release the Bid Security to the DCO. The bank guarantee towards Performance Security provided shall have a validity of not less than 16 (sixteen) months. On receipt of the Performance Security as stipulated herein, IRCTC shall forthwith return the Bid Security, if not returned, to the DCO. The amount of the Performance Security shall be as follows:

a. During the Construction Phase, for a sum equivalent to Rs 50 Lakh (Rupees Fifty Lakh) only. This BG can also be submitted by lead bidder; and
b. During the Operation Period, for a sum equivalent to 4.5% of the value arrived at by multiplying maximum retail price (MRP) of 1 litre bottle of Rail Neer brand PDW, as prevailing at the start of the financial year, with the annual Capacity of the PDW Plant in litres. In the event Rail Neer is replaced, fully or partially, with other any other brand of IRCTC, such other brands shall be considered herein to the extent it replaces the Rail Neer brand.

8.2 Notwithstanding anything to the contrary contained in this Agreement, in the event Performance Security for the Construction Period is not provided by the DCO within the stipulated period from the date of the Agreement, IRCTC may encash the Bid Security and appropriate the proceeds thereof as Damages, and thereupon all rights, privileges, claims and entitlements of the DCO under or arising out of this Agreement shall be deemed to have been waived by, and to have ceased with the concurrence of the DCO, and this Agreement shall be deemed to have been terminated by mutual agreement of the Parties.

8.3 On or before the COD, the DCO shall provide fresh bank guarantee towards Performance Security to meet the criteria specified the contract agreement for operation period. Upon receipt of a fresh bank guarantee, under this clause, IRCTC shall within a period of 21 days return the first performance guarantee. The DCO shall, 45 (forty five) days prior to the expiry of validity of bank guarantee provided towards the Performance Security, replace the bank guarantee with a fresh bank guarantee in similar form or extend the validity period of the bank guarantee for a period not less than 24 (twenty four) months. In the event the DCO fails to extend the validity or provide fresh Performance Security or maintain the Performance Security as per
stipulations herein anytime during the Contract Period, the same shall constitute a DCO Default and without prejudice to its other rights under this Agreement, IRCTC may at its discretion invoke the bank guarantee submitted with IRCTC provided towards Performance Security.

8.4 Appropriation of Performance Security

Upon the occurrence of a DCO Default or failure to meet any Condition Precedent, IRCTC shall, without prejudice to its other rights and remedies hereunder is entitled to encash and appropriate the relevant amounts from the Performance Security as Damages for such DCO Default or failure to meet any Condition Precedent. Upon such encashment and appropriation of the Performance Security, IRCTC shall grant a period of 30 (thirty) days to the DCO to provide either a fresh Performance Security or replenish, through another guarantee, the part amount so encashed failing which IRCTC shall, notwithstanding anything contained in this Agreement relating to Termination, be entitled to Terminate this Agreement in accordance with Article.

8.5 Release of Performance Security

The Performance Security shall remain in force and effect from the date of the Agreement till 60 (sixty) days after the Termination Date except in the event of Termination of the Agreement due to DCO Default, wherein IRCTC shall forfeit the Performance Security. In the event of Termination upon IRCTC Default or Termination under Force Majeure, subject to deduction of dues payable to IRCTC including Damages and compensation, the Performance Security shall be returned within a period of 60 (sixty) days from the Termination Date.
9. PRICE VARIATION CLAUSE

The accepted rates will vary in accordance with the price variation formula given below:

**PRICE VARIATION FORMULA:**

1. **PART-(A) Manufacturing Cost per 1 litre bottle (Ex plant) will remain unchanged for the first year of operation. From the second year of operation it shall be revised on quarterly basis (i.e. on 1st of January, April, July & October) as per following formula:**

\[ R_1 = \left( \frac{R_0}{100} \right) \times \left[ 40 + 34 \times \left( \frac{P_1}{P_0} \right) \times \left( \frac{W_1}{W_0} \right) + 4 \times \left( \frac{C_1}{C_0} \right) + 2 \times \left( \frac{B_1}{B_0} \right) + 6 \times \left( \frac{S_1}{S_0} \right) + 7 \times \left( \frac{L_1}{L_0} \right) + 7 \times \left( \frac{F_1}{F_0} \right) \right] \]

- **R_1** = Updated price
- **R_0** = Accepted price as mentioned in LOA (Manufacturing cost Ex plant)
- **P_1** = Average of price of RELPET grade G5801 as on 15th of each month in the preceding quarter
- **P_0** = Price of RELPET Grade-G5801 as on 15th of proceeding tender opening month
- **W_1** = Revised weight of Preform in grams as specified by IRCTC from time to time
- **W_0** = Weight of Preform in grams as specified in the Schedule E of the Contract Agreement
- **C_1** = Average of price of HDPE Resin Grade-E52009 as on 15th of each month in the preceding quarter
- **C_0** = Base price of HDPE Resin Grade-E52009 as on 15th of proceeding tender opening month
- **B_1** = Average of price of BOPP Resin as on 15th of each month in the preceding quarter
- **B_0** = Base price of BOPP Resin as on 15th of proceeding tender opening month
- **S_1** = Average of price of LDPE Resin as on 15th of each month in the preceding quarter
- **S_0** = Base price of LDPE Resin as on 15th of proceeding tender opening month
- **L_1** = Average of All India Consumer Price Index for Industrial Labour during each month in the preceding quarter as per Labour Bureau, Ministry of Labour Website http://labourbureau.nic.in
- **L_0** = All India Consumer price index for Industrial Labour for tender opening month as per Labour Bureau Ministry of Labour website http://labourbureau.nic.in
- **F_1** = Average of WPI for Electricity for each month during the preceding quarter as per Economic Advisor Ministry of Industry website http://eaindustry.nic.in
- **F_0** = WPI for Electricity for tender opening month as per Economic Advisor Ministry of Industry website http://eaindustry.nic.in

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2. **PART (B) (i) Cost of CFA per 1 litre bottle (To be revised on quarterly basis):** The updated price for Cost of CFA per bottle will remain unchanged for the first two years of operation. From the third year of operation the CFA price would be revised on quarterly basis. The updated price would be calculated on the 1st working day of each quarter (i.e. 1st of January, April, July & October) by the following formula.

   \[\text{For two years from COD: Updated price} = \text{Accepted price}\]

   \[\text{From the third year onwards: Updated price} = \frac{\text{Accepted price}}{100} \times (30 + 50 \times \frac{L_1}{L_0} + 20 \times \frac{D_1}{D_0})\]

   \[\text{Accepted price} = \text{Price as mentioned in LOA (Cost of CFA per bottle)}\]

   \[L_1 = \text{Quarterly Average of minimum wages for unskilled labour applicable in that State where the plant is located for the preceding Quarter}\]

   \[L_0 = \text{Minimum wages for unskilled labour applicable in that State during the tender opening month}\]

   \[D_1 = \text{Average of price of HSD on the 15th of each month of the preceding quarter (PSU-Basic)}\]

   \[D_0 = \text{Price of HSD on the date of tender opening (PSU-Basic)}\]

   **PART (B) (ii) Cost of Transportation (To be revised on quarterly basis):**

   Transportation cost per 1 litre bottle will remain unchanged for the first year of operation. From the second year of operation it shall be revised, on quarterly basis (i.e. on 1st of January, April, July & October) as per following formula:

   \[\text{Updated price} = \frac{\text{Accepted price}}{100} \times (30 + 30 \times \frac{WPI_1}{WPI_0} + 40 \times \frac{D_1}{D_0})\]

   \[\text{Accepted price} = \text{Price as mentioned in LOA (Cost of transportation per bottle)}\]

   \[D_1 = \text{Average of price of HSD on the 15th of each month of the preceding quarter (PSU-Basic)}\]

   \[D_0 = \text{Price of HSD on the date of tender opening (PSU-Basic)}\]

   \[WPI_1 = \text{Three monthly average of overall Wholesale Price Index of quarter}\]

   \[WPI_0 = \text{Overall Wholesale Price Index for tender opening month}\]

   *Note: The price of HSD (High Speed Diesel) at Petrol pump in the state where plant is located to be considered.*

3. **Mid Term Price Review:** IRCTC reserves the right to review the base price and the price variation clause in the mid-term of the contract applicable from the 5th year of commercial operations. The base price and the price variation clause would be reset on mutually agreeable basis to the DCO and IRCTC in order to reflect any major changes in usage of raw materials, cost structure, regulations, and other changes in the operational environment. IRCTC and the DCO may jointly commission a price review study by an independent agency in order to determine the applicable pricing structure.
10. ARBITRATION CLAUSE

(Extract from Draft Contract Agreement, References refer to the articles in the contract agreement)

10.1 Any dispute, difference or controversy of whatever nature regarding the validity, interpretation or the rights and obligations arising out of, or in relation to, or howsoever arising under or in relation to this Contract between the Parties, and so notified by either Party to the other Party (the “Dispute”) shall be subject to the dispute resolution procedure set out hereinafter.

10.2 Direct discussion between Parties: The Parties agree that any Dispute that may arise between them shall be first submitted for direct discussion between the Parties. For this purpose, the notice of Dispute (the “Notice of Dispute”) sent by one Party to the other Party shall be considered an invitation for direct discussion, and it should specify a reasonable time and venue for conduct of the negotiation proceedings. In addition, the Notice of Dispute shall specify the basis of the Dispute. In the direct discussion proceedings, both the Parties shall be represented by any of its officials or employees with sufficient knowledge and authority over the subject matter of the Dispute in order for the discussion to be meaningful. At the discussion proceedings, the Party that has given the Notice of Dispute shall present an offer of a settlement, which may form the starting point of discussions between the two Parties during the discussion proceedings.

10.3 Reconciliation: In the event that the parties are unable to resolve the Dispute through Direct Discussion under the Article 22.2 of the draft contract agreement, any party may make a reference to the Chairman cum Managing Director IRCTC to reconcile the differences and determine the rights and obligations of both the parties. The CMD may further appoint a committee of 2/3 members, one of whom will be nominee of the bidder.

10.4 Arbitration or Adjudication: In the event that the parties are unable to resolve the Dispute through the process of reconciliation under the Article 22.2 and 22.3 of the draft contract agreement, the Parties shall submit the Dispute for arbitration in accordance with the Arbitration and Conciliation Act, 1996.

10.5 The Arbitration shall be conducted by a three member Arbitration tribunal. One member each shall be appointed by both the Parties. Such arbitrators shall be either serving Government Officers or a retired judicial officer or an officer on the panel of Indian Council of Arbitrator or IRCTC. They shall, within 30 days of their appointment, mutually decide on the name of the third arbitrator. Arbitrator proceedings shall be deemed to commence only on the first date of meeting of all the three arbitrators. The place of Arbitration shall be New Delhi.

10.6 Any decision or award resulting from Arbitration shall be final and binding upon the Parties. The fees and expenses of the Arbitration tribunal and all other expenses of the Arbitration shall be initially borne and jointly paid by the Parties in equal proportion subject to determination by the Arbitration tribunal in accordance with instructions

10.7 Pending the submission of and/or decision on a dispute, difference or claim or until the arbitral award is made; the parties shall continue to perform all of their obligations under this Agreement without prejudice to a final adjustment in accordance with such award.

10.8 **Performance during Dispute:** Save in such cases where the dispute has arisen due to premature termination, performance of this Contract shall continue during the settlement of any Dispute under this Article 22 of the draft contract agreement. The provisions for dispute settlement shall be binding upon the successors, assigns and any trustee or receiver of either the parties. In case of premature termination, the Project Premises shall revert back to the IRCTC.
11. FRAUD AND CORRUPT PRACTICES

11.1 The Bidders and their respective officers, employees, agents and advisers shall observe the highest standard of ethics during the Bidding Process and subsequent to the issue of the LOA and during the subsistence of the Contract Agreement. Notwithstanding anything to the contrary contained herein, or in the LOA or the Contract Agreement, IRCTC shall reject a Bid, withdraw the LOA, or terminate the Contract Agreement, as the case may be, without being liable in any manner whatsoever to the Bidder or DCO, as the case may be, if it determines that the Bidder or DCO, as the case may be, has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice in the Bidding Process. In such an event, IRCTC shall forfeit and appropriate the Bid Security or Performance Security, as the case may be, as mutually agreed genuine pre-estimated compensation and damages payable to IRCTC towards, inter alia, time, cost and effort of IRCTC, without prejudice to any other right or remedy that may be available to IRCTC hereunder or otherwise.

11.2 Without prejudice to the rights of IRCTC under Clause 11.1 hereinabove and the rights and remedies which IRCTC may have under the LOA or the Contract Agreement, if an Bidder is found by IRCTC to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice during the Bidding Process or after the issue of the LOA or the execution of the Contract Agreement, such Bidder or DCO shall not be eligible to participate, in any tender or Tender Document issued by IRCTC during a period of 2 (two) years from the date such Bidder or DCO, as the case may be, is found by IRCTC to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practices, as the case may be.

11.3 For the purposes of this Section 11, the following terms shall have the meaning hereinafter respectively assigned to them:

(a) "corrupt practice" means (i) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the actions of any person connected with the Bidding Process (for avoidance of doubt, offering of employment to, or employing, or engaging in any manner whatsoever, directly or indirectly, any official of IRCTC who is or has been associated in any manner, directly or indirectly, with the Bidding Process or the LOA or has dealt with matters concerning the Agreement or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of IRCTC, shall be deemed to constitute influencing the actions of a person connected with the Bidding Process); or (ii) save and except as permitted under sub clause (d) of Clause 2.1.13, engaging in any manner whatsoever, whether during the Bidding Process or after the issue of the LOA or after the execution of the Agreement, as the case may be, any person in respect of any matter relating to the Project or the LOA or the Agreement, who at any time has been
or is a legal, financial or technical adviser of IRCTC in relation to any matter concerning the Project;

(b) "fraudulent practice" means a misrepresentation or omission of facts or suppression of facts or disclosure of incomplete facts, in order to influence the Bidding Process;

(c) "coercive practice" means impairing or harming or threatening to impair or harm, directly or indirectly, any person or property to influence any person's participation or action in the Bidding Process;

(d) "undesirable practice" means (i) establishing contact with any person connected with or employed or engaged by IRCTC with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Bidding Process; or

(ii) having a Conflict of Interest; and

(e) "restrictive practice" means forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the Bidding Process.

(f) The IRCTC may at any time, by notice in writing summarily determine the contract without compensation to the Contractor in any of the following events, that is to say:-

i. If the Contractor being an individual or if a firm, any partner thereof, shall at any time, be adjudged insolvent or shall have a receiving order or order for administration of his estate made against him or shall take any proceeding for composition under any Insolvency Act for the time being in force or made any conveyance or assignment of his effects or enter into any assignment or composition with his creditors or suspend payment or if the firm be dissolved under the Partnership Act, or

ii. If the Contractor being a company is wound up voluntarily or by the order of a Court or a Receiver, Liquidator or Manager on behalf of the Debenture-holders is appointed or circumstances shall have arisen which entitle the Court or Debenture-holders to appoint a Receiver, liquidator or Manager or

iii. If the Contractor commits any breach of the contract not herein specifically provided for. Provided always that such determination shall not prejudice any right of action or remedy which shall have accrued or shall accrue thereafter to the IRCTC and provided also the Contractor shall be liable to pay to the IRCTC for any extra expenditure he is thereby put to and the Contractor shall, under no circumstances, be entitled to any gain on re-purchase.

11.4 The Bidding Process shall be governed by, and construed in accordance with, the laws of India and the Courts at New Delhi shall have exclusive jurisdiction over all disputes arising under, pursuant to and /d or in connection with the Bidding Process.

11.5 IRCTC, in its sole discretion and without incurring any obligation or liability, reserves the right, at any time, to;

a. Suspend and / or cancel the Bidding Process for any or all of the four Projects and / or amend and / or supplement the Bidding Process or modify the dates or other terms and conditions relating thereto;

b. Consult with any Bidder in order to receive clarification or further information;
c. Retain any information and/ or evidence submitted to IRCTC by, on behalf of, and/ or in relation to any Bidder; and/ or

d. Independently verify, disqualify, reject and/ or accept any and all submissions or other information and/ or evidence submitted by or on behalf of any Bidder.

11.6 It shall be deemed that by submitting the Bid, the Bidder agrees and releases IRCTC, its employees, agents and advisers, irrevocably, unconditionally, fully and finally from any and all liability for claims, losses, damages, costs, expenses or liabilities in any way related to or arising from the exercise of any rights and/ or performance of any obligations hereunder and the Bid Documents, pursuant hereto, and/ or in connection with the Bidding Process, to the fullest extent permitted by applicable law, and waives any and all rights and/ or claims it may have in this respect, whether actual or contingent, whether present or in future.
APPENDIX I

Letter Comprising the Bid for Envelope 1: Qualification

(Refer Clause 2.12.1)

Dated: ____________

To,

Group General Manager/ Rail Neer Projects,
IRCTC Ltd.,
11th Floor, A-Wing, Statesman House,
148, Barakhamba Road, Connaught Place,
New Delhi-110 001

Sub: Bid for Selection of Developer-cum-Operator for setting up of ‘Rail Neer’ Packaged Drinking Water Plants at locations ________________

Ref: Tender No.: _____________________ titled: “Selection of Developer-cum-Operator for setting up of ‘Rail Neer’ Packaged Drinking Water Plants”

Dear Sir,

1. With reference to your Tender Document dated __________, I/we, having examined the tender document and understood its contents, hereby submit my/our Bid for the aforesaid project. Bid is unconditional and unqualified.
2. I/We submit bid security amount of Rs. 5 lakh (Rs. Five Lakh) in Demand Draft in favour of Indian Railway Catering and Tourism Corporation.
3. I/ We acknowledge that IRCTC will be relying on the information provided in the Bid and the documents accompanying such Bid for qualification of the Bidders for the aforesaid project, and we certify that all information provided in the Bid and in Annexes I to IV is true and correct; nothing has been omitted which renders such information misleading; and all documents accompanying such Bid are true copies of their respective originals.
4. This statement is made for the express purpose of qualifying as a Bidder for the development, construction, operation, and maintenance of the aforesaid Project and supply of packaged bottled drinking water therefrom to designated sale outlets for Rail Neer brand of IRCTC as per terms of Agreement.

__________________________

3 All Blanks to be filled by the Bidder as appropriate. All pages to be initialled in blue ink & stamped

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5. I/ We shall make available to IRCTC any additional information it may find necessary or required to supplement or authenticate the Bid Statement.
6. I/ We acknowledge the right of IRCTC to reject our Bid without assigning any reason or otherwise and hereby waive, to the fullest extent permitted by applicable law, our right to challenge the same on any account whatsoever.
7. I/ We certify that in the last three years, we/ any of the Consortium Members or our/ their Associates have neither failed to perform on any contract, as evidenced by imposition of a penalty by an arbitral or judicial authority or a judicial pronouncement or arbitration award, nor been expelled from any project or contract by any public authority nor have had any contract terminated by any public authority for breach on our part.
8. I/ We declare that:

   a. I/ We have examined and have no reservations to the Tender Document, including any Addendum issued by IRCTC;
   b. I/ We do not have any conflict of interest in accordance with Clause 2.1.13 of the Tender Document;
   c. I/We have not directly or indirectly or through an agent engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice, as defined in Clause 11.3 of the Tender Document, in respect of any tender or request for proposal issued by or any agreement entered into with IRCTC or any other public sector enterprise or any government, Central or State; and
   d. I/ We hereby certify that we have taken steps to ensure that in conformity with the provisions of Section 11 of the Tender Document, no person acting for us or on our behalf has engaged or will engage in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice.

9. I/ We understand that you may cancel the Bidding Process at any time and that you are neither bound to accept any Bid that you may receive nor to invite the Bidders to Bid for the Project, without incurring any liability to the Bidders, in accordance with Clause 11.5 of the Tender Document.
10. I/ We believe that we/ our Consortium/ proposed Consortium satisfy(s) the Net Worth criteria and meet(s) all the requirements as specified in the Tender Document and are/ is qualified to submit a Bid.
11. I/ We declare that we/ any Member of the Consortium, or our/ its Associates are not a Member of a/ any other Consortium applying for pre-qualification.
12. I/ We certify that in regard to matters other than security and integrity of the country, we/ any Member of the Consortium or any of our/their Associates have not been convicted by a Court of Law or indicted or adverse orders passed by a regulatory authority which could cast a doubt on our ability to undertake the Project or which relates to a grave offence that outrages the moral sense of the community.
13. I/ We further certify that in regard to matters relating to security and integrity of the country, we/ any Member of the Consortium or any of our/ their Associates have not been charge-sheeted by any agency of the Government or convicted by a Court of Law.
14. I/ We further certify that no investigation by a regulatory authority is pending either against us/ any Member of the Consortium or against our/ their Associates or against our CEO or any of our directors/ managers/ employees.

15. I/ We undertake that in case due to any change in facts or circumstances during the Bidding Process, we are attracted by the provisions of disqualification in terms of the provisions of this Tender Document, we shall intimate IRCTC of the same immediately.

16. The Statement of Legal Capacity as per format provided at Annex-V in Appendix-I of the Tender Document, and duly signed, is enclosed. The power of attorney for signing of Bid and the power of attorney for Lead Member of consortium, as per format provided at Appendix II and III respectively of the Tender Document, are also enclosed.

17. I/ We understand that the selected Bidder shall either be an existing Company, incorporated under the Indian Companies Act, 2013, or shall incorporate as such prior to execution of the Agreement.

18. I/ We hereby irrevocably waive any right or remedy which we may have at any stage at law or howsoever otherwise arising to challenge or question any decision taken by IRCTC in connection with the selection of Bidders, selection of the Bidder, or in connection with the selection/ Bidding Process itself, in respect of the above mentioned Project and the terms and implementation thereof.

19. I/ We agree and undertake to abide by all the terms and conditions of the Tender Document.

20. I/ We certify that in terms of the tender document, my/our Networth is Rs.___________ (Rs. in words) and we meet the Threshold Technical Capacity and Financial Capacity prescribed in Clauses of the Tender Document.

21. We agree and undertake to be jointly and severally liable for all the obligations of the DCO under the Agreement till occurrence of Financial Close in accordance with the Agreement.⁴

22. I/We agree to keep this offer valid for 120 (one hundred and twenty) days from the Bid Due Date specified in the Tender Document.

In witness thereof, I/ we submit this Bid under and in accordance with the terms of the Tender Document.

Date:
Place:

Yours faithfully

(Signature, name & Designation of the Authorized Signatory)
(NAME AND SEAL OF THE SOLE BIDDER/ LEAD MEMBER OF CONSORTIUM)

⁴ Omit if Bidder is not a consortium
Details of Bidder

Preference:

<table>
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<tr>
<th>In order of Preference</th>
<th>Project (Location)</th>
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<tbody>
<tr>
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<td>Preference 4</td>
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<td>Preference 5</td>
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<td>Preference 6</td>
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<td>Preference 7</td>
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</tbody>
</table>

1. Details of the company
   (a) Name
   (b) Type of Entity: Sole Proprietorship/ Company under Companies Act/ Partnership Firm under Indian Partnership Act 1932 or Limited Liability Partnership Act 2008
   (c) Country of incorporation:
   (d) Address of the corporate headquarters and its branch office(s), if any, in India:
   (e) Registration number & date of incorporation:

2. Brief description of the Company including details of its main lines of business and proposed role and responsibilities in this Project:

3. Details of individual(s) who will serve as the point of contact/ communication for IRCTC:
   a. Name:
   b. Designation:
   c. Company:
   d. Address:
e. Telephone Number:

f. E-Mail Address:

g. Fax Number:

4. Particulars of the Authorized Signatory of the Bidder:

   a. Name:

   b. Designation:

   c. Company:

   d. Address:

   e. Telephone Number:

   f. Fax Number:

5. In case of a Consortium:

   a. The information above (3-4) should be provided for all the Members of the Consortium.

   b. A copy of the Joint Bidding Agreement, as envisaged in clause 2.1.13 should be attached to the Bid.

   c. Information regarding the role of each Member should be provided as per table below:

<table>
<thead>
<tr>
<th>SI No:</th>
<th>Name of Member</th>
<th>Role*</th>
<th>Percentage of Equity in the consortium {Refer clause 2.1.13}</th>
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</tbody>
</table>

*The role of each Member, as may be determined by the Bidder, should be indicated in accordance with instruction 4 at Annex IV*
6. The following information shall also be provided for each Member of the Consortium:

Name of Bidder / member of Consortium:________________

<table>
<thead>
<tr>
<th>S no.</th>
<th>Criteria</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Has the Bidder/ constituent of the Consortium been barred by the [Central/ State] Government, or any entity controlled by it, from participating in any project?</td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>If the answer to 1 is yes, does the bar subsist as on the date of Bid?</td>
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<tr>
<td>3</td>
<td>Has the Bidder/ constituent of the Consortium paid liquidated damages of more than 5% of the contract value in a contract due to delay or has been penalised due to any other reason in relation to execution of a contract, in the last three years?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. A statement by the Bidder and each of the Members of its Consortium (where applicable) or any of their Associates disclosing material non-performance or contractual non-compliance in past projects, contractual disputes and litigation/ arbitration in the recent past is given below (Attach extra sheets, if necessary)
### ANNEXURE- II

Experience of the Bidder

<table>
<thead>
<tr>
<th>Bidder Type</th>
<th>Member Code *</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single entity Bidder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consortium Member 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consortium Member 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Provide details of only those projects that have been undertaken by the Bidder under its own name and/ or by an Associate specified in Clause 3.4.9 In case the Bid Due Date falls within 3 (three) months of the close of the latest financial year, refer to Clause 3.4.13.

# An Bidder consisting of a single entity should fill in details as per the row titled Single entity Bidder and ignore the rows titled Consortium Member. In case of a Consortium, the row titled Single entity Bidder may be filled for Consortium Member 1. In case credit is claimed for an Associate, necessary evidence to establish the relationship of the Bidder with such Associate, in terms of Clause 3.4.9, shall be provided.
### ANNEXURE - III

**Financial Capacity of the Bidder**

*(Figures in Rs. crore)*

<table>
<thead>
<tr>
<th>Bidder Type</th>
<th>Net Worth *As on 31.03.17</th>
<th>Annual turn over</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2014-15</td>
<td>2015-16</td>
<td>2016-17</td>
<td>Total</td>
</tr>
<tr>
<td>Single Entity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consortium Member 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consortium Member 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Name & address of Bidder's Bankers:**

*A Bidder consisting of a single entity should fill in details as per the row titled Single entity Bidder and ignore the rows titled Consortium Members. In case of a Consortium, row titled Single entity Bidder may be ignored.*

# For Member Code, see instruction 4 at Annex-IV of this Appendix-I.

* The Bidder should provide details of its own Financial Capacity or of an Associate specified in Clause 3.4.9.

**Instructions:**

1. The Bidder/ its constituent Consortium Members shall attach copies of the balance sheets, financial statements and Annual Reports for 3 (three) years preceding the Bid Due Date. The financial statements shall:
   a. Reflect the financial situation of the Bidder or Consortium Members and its/ their Associates where the Bidder is relying on its Associate's financials;
   b. Be audited by a Chartered Accountant;
   c. Be complete, including all notes to the financial statements; and
   d. Correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

2. Net Worth shall mean (Subscribed and Paid-up Equity + Reserves) less (Revaluation reserves + miscellaneous expenditure not written off + reserves not available for...
distribution to equity shareholders). In case of entities other than companies, this shall mean “assets less liabilities” the valuation in all cases is to be done on historical cost basis”.

3. Year 1 will be the latest completed financial year, preceding the bidding. Year 2 shall be the year immediately preceding Year 1 and so on. In case the Bid Due Date falls within 3 (three) months of the close of the latest financial year, refer to Clause 3.4.13.

4. In the case of a Consortium, a copy of the Joint Bidding Agreement shall be submitted in accordance with Clause 3.4.6 of the Tender Document.

5. The Bidder shall also provide the name and address of the Bankers to the Bidder.

6. The Bidder shall provide an Auditor's Certificate specifying the net worth of the Bidder and also specifying the methodology adopted for calculating such net worth in accordance with the Tender Document.
# ANNEXURE IV
Details of bidder for technical capacity

<table>
<thead>
<tr>
<th>Item</th>
<th>Particular</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Operational and maintenance related details [clause no. 3.4.2, A (i), (ii)]</td>
<td></td>
</tr>
<tr>
<td>1. Name of the plant, location</td>
<td></td>
</tr>
<tr>
<td>2. Type of finished product</td>
<td></td>
</tr>
<tr>
<td>3. Capacity of plant</td>
<td></td>
</tr>
<tr>
<td>4. Annual production</td>
<td>2014-15</td>
</tr>
<tr>
<td></td>
<td>2015-16</td>
</tr>
<tr>
<td></td>
<td>2016-17</td>
</tr>
<tr>
<td>5. Details of plant and machinery</td>
<td>Capacity</td>
</tr>
<tr>
<td></td>
<td>Make</td>
</tr>
<tr>
<td></td>
<td>Remarks</td>
</tr>
<tr>
<td>(i) Water Treatment Plant</td>
<td></td>
</tr>
<tr>
<td>(ii) Bottle Blowing</td>
<td></td>
</tr>
<tr>
<td>(iii) Bottle Filling</td>
<td></td>
</tr>
<tr>
<td>Date of commissioning of plant</td>
<td></td>
</tr>
<tr>
<td>(B) Engineering Procurement and Construction (EPC) contract related details [clause no. 3.4.2, A (iii)]</td>
<td></td>
</tr>
<tr>
<td>(a) Details of first plant</td>
<td></td>
</tr>
<tr>
<td>1. Name of the plant, location</td>
<td></td>
</tr>
<tr>
<td>2. Type of finished product</td>
<td></td>
</tr>
<tr>
<td>3. Capacity of plant</td>
<td></td>
</tr>
<tr>
<td>4. Details of plant and machinery</td>
<td>Capacity</td>
</tr>
<tr>
<td></td>
<td>Make</td>
</tr>
<tr>
<td></td>
<td>Remarks</td>
</tr>
<tr>
<td>(i) Water Treatment Plant</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>---</td>
</tr>
<tr>
<td>(ii) Bottle Blowing</td>
<td></td>
</tr>
<tr>
<td>(iii) Bottle Filling</td>
<td></td>
</tr>
</tbody>
</table>

(b) Details of second plant

1. Name of the plant, location
2. Type of finished product
3. Capacity of plant
4. Details of plant and machinery  | Capacity | Make | Remarks |
(i) Water Treatment Plant |    |     |      |
(ii) Bottle Blowing        |    |     |      |
(iii) Bottle Filling       |    |     |      |

**Note:** The bidder shall submit:

a) **Operational & maintenance related details:**

i) Annual Excise Return and its summary for all the three years (2014-15, 2015-16, 2016-17) in support of annual production duly verified by CA.

ii) Valid BIS & FSSAI licenses as applicable during period mentioned above at (i).

iii) Proof of automatic Blowing, Filling Machines and Water Treatment Plant i.e. copy of POs & its completion certificates.

(In case bidder is not the owner of the plant and operating the plant as an O&M contractor, then the bidder will submit copy of contract agreement with owner of the plant along with above documents (i), (ii) & (iii) of the owner. For bidders who are operating IRCTC owned plants, a certificate from Plant Manager regarding production will be acceptable and no need to submit above documents at i, ii & iii.)

b) **EPC contract related details {clause 3.4.2.A (iii)}:**

(i) PO copies & completion certificates of each eligible plant during last three financial years (2014-15, 2015-16, 2016-17) showing details of equipments with their minimum capacity.

(ii) Name of customer with designation & contact no of each eligible plant
Instructions:

1. Bidders are expected to provide information in respect of each Eligible Projects in this Annex. The projects cited must comply with the eligibility criteria specified in Clause 3.4 of the Tender Document, as the case may be. Information provided in this section is intended to serve as a backup for information provided in the Bid. Bidders should also refer to the Instructions below.

2. Member Code shall indicate NA for Not Applicable in case of a single entity Bidder. For other Members, the following abbreviations are suggested viz. LM means Lead Member, TM means Technical Member, FM means Financial Member, OMM means Operation & Maintenance Member; and OM means Other Member. In case the Eligible Project relates to an Associate of the Bidder or its Member, write "Associate" along with Member Code.

3. In the event that credit is being taken for the Eligible Experience of an Associate, as defined in Clause 3.4.9, the Bidder should also provide a certificate in the format below:

<table>
<thead>
<tr>
<th>Certificate from Statutory Auditor/ Company Secretary regarding Associate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on the authenticated record of the Company, this is to certify that more than 50% (fifty per cent) of the subscribed and paid up voting equity of _______________ (name of the Bidder/ Consortium Member/ Associate) is held, directly or indirectly, by _______________ (name of Associate/ Bidder/ Consortium Member). By virtue of the aforesaid shareholding, the latter exercises control over the former, who is an Associate in terms of Clause 3.4.9 of the TENDER DOCUMENT. A brief description of the said equity held, directly or indirectly, is given below: [Describe the share-holding of the Bidder/Consortium Member and the Associate. In the event the Associate is under common control with the Bidder/ Consortium Member, the relationship may be suitably described and similarly certified herein ] (Signature, Name &amp; Designation of the Authorized Signatory)</td>
</tr>
<tr>
<td>Name of the audit firm:</td>
</tr>
<tr>
<td>Seal of the audit firm:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
</tbody>
</table>
* In the event that the Bidder/ Consortium Member exercises control over an Associate by operation of law, this certificate may be suitably modified and

# In the case of indirect share-holding, the intervening companies in the chain of ownership should also be Associates i.e., the share-holding in each such company should be more than 50% in order to establish that the chain of "control" is not broken.

1. It may be noted that in the absence of any detail in the above certificates, the information would be considered inadequate and could lead to exclusion of the relevant project in computation of Eligibility. Copies of the relevant law may be enclosed and referred to.
ANNEXURE -V

Authorization for submission of Tender Document

(To be forwarded on the letterhead of the Sole Bidder/ Lead Member of Consortium)

Date: ________

To,

Group General Manager/ Rail Neer Projects,
IRCTC Ltd.,
11th Floor, A-Wing, Statesman House,
148, Barakhamba Road,
Connaught Place, New Delhi-110 001

Dear Sir,

We hereby confirm that we/ our members in the Consortium (constitution of which has been described in the Bid) satisfy the terms and conditions laid out in the Tender Document.

We have agreed that ______________________(insert member's name) will act as the Lead Member of our consortium.*

We have agreed that ______________________(insert individual's name) will act as our representative/ will act as the representative of the consortium on its behalf* and has been duly authorized to submit the Tender Document. *

Further, the authorised signatory is vested with requisite powers to furnish such letter and authenticate the same.

Thanking you,

Yours faithfully,

(Signature, name and designation of the authorised signatory)

For and on behalf of____________________________________

*Please strike out whichever is not applicable
**ANNEXURE -VI**

Checklist of documents to be submitted by the bidder in Envelope – I

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description of Documents</th>
<th>Status (Enclosed/not Enclosed)</th>
<th>Page nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>a) Tender document cost of Rs. 5000/- (Five thousand) through Demand Draft per project.&lt;br&gt;b) Earnest money deposit (EMD) of Rs. 5,00,000/- (Five lakh) per project.&lt;br&gt;(Demand Drafts should be in favour of Indian Railway Catering and Tourism Corporation Ltd., payable at New Delhi)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td><strong>Status of the bidder:</strong>&lt;br&gt;Company/Partnership firm/ Individual (In case of consortium, please specify for all the consortium members)&lt;br&gt;a) <strong>In case of Company:</strong>&lt;br&gt;Enclose a certified Memorandum and Articles of Association along with certificates of incorporation and commencement of business etc and list of present Directors with addresses.&lt;br&gt;b) <strong>In case of partnership firm:</strong>&lt;br&gt;Enclose Name of the partners with complete address, certificate of registration (if any), and partnership deed duly attested by Notary.&lt;br&gt;c) <strong>In case of proprietorship firm:</strong>&lt;br&gt;Name of the proprietor with complete address and copy of PAN&lt;br&gt;(In case of Consortium, above documents will be submitted by all the consortium members)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td><strong>Financial Capacity:</strong>&lt;br&gt;a) Balance sheet and Profit and Loss A/c of the last completed each three financial years, duly audited by a Chartered Accountant/ Published Annual Report. (for all members if consortium)&lt;br&gt;b) Certificate(s) from its Chartered Accountant specifying the Net worth as at the close of the preceding year specifying the methodology adopted for calculating such net worth.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td><strong>Technical Capacity:</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
a. **Operational & maintenance related details:**

   i) Annual Excise Return and its summary for all the three years (2014-15, 2015-16, 2016-17) in support of annual production duly verified by CA.

   ii) Valid BIS & FSSAI licenses as applicable during period mentioned above at (i).

   iii) Proof of automatic blowing and filling machines i.e. copy of POs & its completion certificates.

   **Note:** In case bidder is not the owner of the plant and operating the plant as an O&M contractor, then the bidder will submit copy of contract agreement with owner of the plant alongwith above documents (i), (ii) & (iii) of the owner. For bidders who are operating IRCTC owned plants, a certificate from Plant Manager regarding production will be acceptable and no need to submit above documents at i, ii & iii.

b) **EPC contract related details (clause 3.4.2.A (iii)):**

   i) PO copies & completion certificates of each eligible plant during last three financial years (2014-15, 2015-16, 2016-17) showing details of equipments with their minimum capacity.

   ii) Name of customer with designation & contact no of each eligible plant

---

6. a) **Appendix - II:** Power of Attorney for signing of Bid

   b) **Appendix – III:** Power of Attorney for lead member of consortium (in the case of Consortium)

   c) **Appendix – IV:** Joint Bidding Agreement (in the case of Consortium)

   **Note:**

   i) All the above three documents should be executed on Non Judicial stamp paper of Rs. 100 & to be attested by Exe. Mag/Notary Public with Notarial stamp).

   ii) Each consortium member/Bidder should submit the board resolution/power of attorney in favour of Authorized Signatory for signing the bid document.

---

7. All the conditions of GST will be applicable instead of erstwhile Taxation laws. The bidder should be registered under GST and also he should not opt for composite scheme under GST. **Documentary proof of GST registration is required to be submitted in this regard.**

   “Moreover, any loss occurred to IRCTC on account of non-availing of input tax credit (ITC) due to the lapses/fault on the part of the contractor will be compensated by the contractor to IRCTC.”

---

8. Copy of Tender document, true copy of Integrity pact and draft contract agreement duly signed and sealed on all pages by Authorised signatory
APPENDIX II

Power of Attorney for signing of Bid

(Refer Clause 3.4.5)

(On Non Judicial stamp paper of Rs. 100 & to be attested by Exe. Mag./Notary Public with Notorial stamp)

Know all men by these presents, We ________________ (name of the firm and address of the registered office) do hereby irrevocably constitute, nominate, appoint and authorise Mr/ Ms (name), ________ son/daughter/wife of _____________ and presently residing at __________, who is presently employed with us/ the Lead Member of our Consortium and holding the position of ____________, as our true and lawful attorney (hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our Bid for pre-qualification and submission of our bid for the “Selection of developer for setting up of ‘Rail Neer’ Packaged Drinking Water Plants” (the “Project”) proposed or being developed by the “Indian Railways Catering and Tourism Corporation Ltd.” (IRCTC) including but not limited to signing and submission of all Bids, bids and other documents and writings, participate in Pre Bids and other conferences and providing information/ responses to IRCTC, representing us in all matters before IRCTC, signing and execution of all contracts including the Agreement and undertakings consequent to acceptance of our bid, and generally dealing with IRCTC in all matters in connection with or relating to or arising out of our bid for the said Project and/or upon award thereof to us and/or till the entering into of the Agreement with IRCTC.

AND we hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE, __________., THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS ___ DAY OF ______2___.

For

__________________________

(Signature, name, designation and address)

Witnesses:

1. (Notarized)

2.
(Signature, Name, Title and Address of the Attorney)

Notes:

The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants (s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

Wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a board or shareholders’ resolution/ power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

For a Power of Attorney executed and issued overseas, the document will also have to be legalised by the Indian Embassy and notarised in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalised by the Indian Embassy if it carries a conforming Appostille certificate
APPENDIX III

Power of Attorney for Lead Member of Consortium

(Refer Clause 3.4.5)
(On Non Judicial stamp paper of Rs. 100 & to be attested by Exe. Mag./Notary Public with Notorial stamp)

Whereas the “Indian Railways Catering and Tourism Corporation Ltd.” ("IRCTC") has invited Bids from interested parties for the “Selection of Developer-cum-Operator for setting up of Rail Neer Packaged Drinking Water Plants " (the "Project").

Whereas, _____________, _____________, _____________ and _____________ (collectively the "Consortium") being Members of the Consortium are interested in bidding for the Project in accordance with the terms and conditions of the Request for Proposal document (TENDER DOCUMENT ), Request for Proposal (TENDER DOCUMENT ) and other connected documents in respect of the Project, and

Whereas, it is necessary for the Members of the Consortium to designate one of them as the Lead Member with all necessary power and authority to do for and on behalf of the Consortium, all acts, deeds and things as may be necessary in connection with the Consortium's bid for the Project and its execution.

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS

We, _____________having our registered office at _____________, M/s. _____________ having our registered office at _____________, M/s. _____________ having our registered office at _____________, and _____________ having our registered office at _____________, (hereinafter collectively referred to as the "Principals") do hereby irrevocably designate, nominate, constitute, appoint and authorise M/S _____________ having its registered office at _____________, being one of the Members of the Consortium, as the Lead Member and true and lawful attorney of the Consortium (hereinafter referred to as the "Attorney"). We hereby irrevocably authorise the Attorney (with power to sub-delegate) to conduct all business for and on behalf of the Consortium and any one of us during the bidding process and, in the event the Consortium is awarded the contract/contract, during the execution of the Project and in this regard, to do on our behalf and on behalf of the Consortium, all or any of such acts, deeds or things as are necessary or required or incidental to the pre-qualification of the Consortium and submission of its bid for the Project, including but not limited to signing and
submission of all Bids, bids and other documents and writings, participate in bidders and other conferences, respond to queries, submit information/documents, sign and execute contracts and undertakings consequent to acceptance of the bid of the Consortium and generally to represent the Consortium in all its dealings with IRCTC, and/or any other Government Agency or any person, in all matters in connection with or relating to or arising out of the Consortium’s bid for the Project and/or upon award thereof till the Agreement is entered into with IRCTC.

AND hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us/Consortium.

IN WITNESS WHEREOF WE THE PRINCIPALS ABOVE NAMED HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS _______ DAY OF ________ 20__

For __________________________
(Signature)

_______________________________
(Name & Title)

For __________________________
(Signature)

_______________________________
(Name & Title)

For __________________________
(Signature)

_______________________________
(Name & Title)

Witnesses:
1.
2.

_______________________________
(Executants)

(To be executed by all the Members of the Consortium)

notes:
The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

Also, wherever required, the Bidder should submit for verification the extract of the charter documents and documents such as a board or shareholders' resolution/ power of attorney in favour of the person executing this Power of Attorney for the delegation of power hereunder on behalf of the Bidder.

For a Power of Attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by Bidders from countries that have signed the Hague Legislation Convention 1961 are not required to be legalized by the Indian Embassy if it carries a conforming Apostille certificate.
APPENDIX IV

Joint Bidding Agreement
(Refer Clause 3.4.6)

(On Non Judicial stamp paper of Rs. 100 & to be attested by Exe. Mag./Notary Public with Notorial stamp.)

THIS JOINT BIDDING AGREEMENT is entered into on this the ____ day of ____ 20_

AMONGST

1. {______, a sole proprietorship / partnership / company registered under the _______ Act, of ____} and having its registered office at _______ (hereinafter referred to as the "First Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

   AND

2. {______, a sole proprietorship / partnership / company registered under the _______ Act, of ____} and having its registered office at _______ (hereinafter referred to as the "Second Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

   AND

3. {______, a sole proprietorship / partnership / company registered under the _______ Act, of ____} and having its registered office at _______ (hereinafter referred to as the "Third Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

   AND

4. {______, a sole proprietorship / partnership / company registered under the _______ Act, of ____} and having its registered office at _______ (hereinafter referred to as the "Fourth Part" which expression shall, unless repugnant to the context include its successors and permitted assigns)

5. The above mentioned parties of the FIRST, SECOND, {THIRD and FOURTH} PART are collectively referred to as the "Parties" and each is individually referred to as a "Party"
(A) Indian Railways Catering and Tourism Corporation Ltd. (hereinafter referred to as the "IRCTC" which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns) has invited Bids (the Bids") by its Request for Proposal No. ______ dated ______ (the "Tender Document ") for “Selection of Developer-cum-Operator for setting up Rail Neer Packaged Drinking Water Plants” Project (the "Project").

(B) The Parties are interested in jointly bidding for the Project as members of a Consortium and in accordance with the terms and conditions of the Tender Document and other bid documents in respect of the Project, and

(C) It is a necessary condition under the Tender Document that the members of the Consortium shall enter into a Joint Bidding Agreement and furnish a copy thereof with the Bid.

NOW IT IS HEREBY AGREED as follows:

1. **Definitions and Interpretations**

   In this Agreement, the capitalized terms shall, unless the context otherwise requires, have the meaning ascribed thereto under the Tender Document.

2. **Consortium**

   a) The Parties do hereby irrevocably constitute a consortium (the "Consortium") for the purposes of jointly participating in the Bidding Process for the Project.

   b) The Parties hereby undertake to participate in the Bidding Process only through this Consortium and not individually and/or through any other consortium constituted for this Project, either directly or indirectly or through any of their Associates.

3. **Covenants**

   The Parties hereby undertake that in the event the Consortium is declared the selected Bidder and awarded the Project, it shall incorporate a special purpose vehicle (the "SPV") under the Indian Companies Act, 1956 for entering into an Agreement with IRCTC and for performing all its obligations as the DCO in terms of the Agreement for the Project.

4. **Role of the Parties**

   The Parties hereby undertake to perform the roles and responsibilities as described below:

   (a) Party of the First Part shall be the Lead member of the Consortium and shall have the power of attorney from all Parties for conducting all business for and on behalf of the Consortium during the Bidding Process and until the Appointed Date under the Agreement when all the obligations of the SPV shall become effective;

   (b) Party of the Second Part shall be the _________ Member of the Consortium;

   (c) Party of the Third Part shall be the _________ Member of the Consortium; and

   (d) Party of the Fourth part shall be the ___________________ Member/other Member of the Consortium.
5. **Joint and Several Liability**

The Parties do hereby undertake to be jointly and severally responsible for all obligations and liabilities relating to the Project and in accordance with the terms of the Tender Document and the Agreement, till such time as the Financial Close for the Project is achieved under and in accordance with the Agreement.

6. **Shareholding in the SPV**

a) The Parties agree that the proportion of shareholding among the Parties in the SPV shall be as follows:

**First Party:**

**Second Party:**

**Third Party:**

**Fourth Party:**

b) The Party of the First Part undertakes that it shall, during the Construction Period, hold a minimum of 26% (twenty six per cent) of the subscribed and paid up equity share capital of the SPV. The Parties undertake that the subscribed and paid up equity share capital of the SPV shall, at all times till the Fifth anniversary of the date of commercial operation of the Project, be held by the Parties of the First, Second (and Third Part\(^6\)) whose experience and net worth have been reckoned for the purposes of qualification and short-listing of Bidders for the Project in terms of the Tender Document.

c) The Parties undertake that each of the Parties specified in Clause 6(b) above shall, at all times between the commercial operation date of the Project and the second anniversary thereof, hold subscribed and paid up equity share capital of SPV equivalent to at least

d) 5% (five per cent) of the Total Project Cost. The Parties undertake that they shall collectively hold at least 51% (fifty one per cent) of the subscribed and paid up equity share capital of the SPV at all times after the fifth anniversary of the commercial operation date till the end of the Contract Period.

e) The Parties undertake that they shall comply with all equity lock-in requirements set forth in the Agreement.

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\(^5\) Members other than Lead Members may be designated as Finance / Technical or as Other member

\(^6\) Modify as required
7. Representation of the Parties

Each Party represents to the other Parties as of the date of this Agreement that:

a) Such Party is duly organised, validly existing and in good standing under the laws of its incorporation and has all requisite power and authority to enter into this Agreement;
b) The execution, delivery and performance by such Party of this Agreement has been authorised by all necessary and appropriate corporate or governmental action and a copy of the extract of the charter documents and board resolution/ power of attorney in favour of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the Consortium Member is annexed to this Agreement, and will not, to the best of its knowledge:

   I. require any consent or approval not already obtained;
   II. violate any Applicable Law presently in effect and having applicability to it;
   III. violate the memorandum and articles of association, by-laws or other applicable organisational documents thereof;
   IV. violate any clearance, permit, contract, grant, license or other governmental authorisation, approval, judgement, order or decree or any mortgage agreement, indenture or any other instrument to which such Party is a party or by which such Party or any of its properties or assets are bound or that is otherwise applicable to such Party; or
   V. create or impose any liens, mortgages, pledges, claims, security interests, charges or Encumbrances or obligations to create a lien, charge, pledge, security interest, encumbrances or mortgage in or on the property of such Party, except for encumbrances that would not, individually or in the aggregate, have a material adverse effect on the financial condition or prospects or business of such Party so as to prevent such Party from fulfilling its obligations under this Agreement;

c) this Agreement is the legal and binding obligation of such Party, enforceable in accordance with its terms against it; and
d) there is no litigation pending or, to the best of such Party's knowledge, threatened to which it or any of its Affiliates is a party that presently affects or which would have a material adverse effect on the financial condition or prospects or business of such Party in the fulfillment of its obligations under this Agreement.

8. Termination

This Agreement shall be effective from the date hereof and shall continue in full force effect until the Financial Close of the Project is achieved under and in accordance with the Agreement, in case the Project is awarded to the Consortium. However, in case the Consortium is either not pre-qualified for the Project or does not get selected for award of the Project, the Agreement will stand terminated in case the Bidder is not qualified or upon return of the Bid Security by IRCTC to the Bidder, as the case may be.

9. Miscellaneous

a) This Joint Bidding Agreement shall be governed by laws of India.

b) The Parties acknowledge and accept that this Agreement shall not be amended by the Parties without the prior written consent of IRCTC.
IN WITNESS WHEREOF THE PARTIES ABOVE NAMED HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED

For and on behalf of

LEAD MEMBER by:

(Signature)
(Name)
(Designation)
(Address)

SIGNED, SEALED AND DELIVERED

For and on behalf of

SECOND PART by:

(Signature)
(Name)
(Designation)
(Address)

SIGNED, SEALED AND DELIVERED

Four and on behalf of

THIRD PART by:

(Signature)
(Name)
(Designation)
(Address)

SIGNED, SEALED AND DELIVERED

For and on behalf of

FOURTH PART by:

(Signature)
(Name)
(Designation)
(Address)
Notes:

1. The mode of the execution of the Joint Bidding Agreement should be in accordance with the procedure, if any, laid down by the Applicable Law and the charter documents of the executants (s) and when it is so required, the same should be under common seal affixed in accordance with the required procedure.

2. Each Joint Bidding Agreement should attach a copy of the extract of the charter documents and documents such as resolution / power of attorney in favour of the person executing this Agreement for the delegation of power and authority to execute this Agreement on behalf of the Consortium Member.

3. For a Joint Bidding Agreement executed and issued overseas, the document shall be legalized by the Indian Embassy and notarized in the jurisdiction where the Power of Attorney has been executed.
APPENDIX V

ENVELOPE 2: FINANCIAL PROPOSAL

Dated: ____________

To,

Group General Manager/ Rail Neer Projects,
IRCTC Ltd.,
11th Floor, A-Wing, Statesman House,
148, Barakhamba Road, Connaught Place,
New Delhi-110 001

Sub: Financial Proposal for Selection of developer for setting up of ‘Rail Neer’
Packaged Drinking Water Plant at location - ________________  
Ref: Tender No: ____________”

Dear Sir,

1. With reference to your Tender Document dated ____________, I/we, having examined the
   Tender Document and understood its contents; hereby submit my/our bid for the aforesaid
   project. The Bid is unconditional and unqualified.
2. I/We acknowledge the right of IRCTC to reject our Bid without assigning any reason or
   other and hereby waive our right to challenge the same on any account whatsoever.
3. I/We declare that :

   (a) I/We have examined and have no reservation to the Bidding Documents, 
       including any Addendum issued by IRCTC;
   (b) I/We do not have any conflict of interest in accordance with the terms of this Tender 
       Document;
   (c) I/We have not directly or indirectly or through an agent engaged or indulged in any 
       corrupt practices, fraudulent practice, coercive practice, undesirable practice of 
       restrictive practice, defined in this Tender Document, in respect of any tender or 
       request for proposal by or any agreement entered into with IRCTC or any other 
       public sector enterprise or any government, Central or State; and

8 Mention one location as per the Tender Document . Separate sealed Bid under Envelope 2 to be submitted for each location.
9 All Blanks to be filled by the Bidder as appropriate. EACH PAGE SHOULD BE SIGNED AND STAMPED
(d) I/We herby certify that we have taken steps to ensure that in conformity with the provisions of Clause 4 of the Tender Document, no person acting for us or on our behalf has engaged or will engage in any corrupt practices, fraudulent practice, coercive practice, undesirable practice or restrictive practice.

4. I/We understand that IRCTC may cancel the Bidding Process at any time and that you are neither bound to accept any Bid that you may receive or to invite the Bidders to Bid for the Project, without incurring any liability to the Bidders, in accordance with terms of this Tender Document.

5. I/We believe that we/our Consortium satisfies the Net Worth criteria and meets the requirement as specified in the Tender Document and are/is qualified to submit a Bid.

6. In the event of my/our being declared as the Selected Bidder, I/We agree to enter into a Contract Agreement in accordance with the draft that has been provided to me/us prior to the Bid Due Date. We agree not to seek any changes in the aforesaid draft and agree to abide by the same.

7. The price has been quoted by me/us after taking into consideration all the terms and conditions stated in the tender document, draft Contract Agreement, our own estimates of costs and after a careful assessment of the site and all the conditions that may affect the Bid.

8. I/We offer a Bid Security of Rs____________(Rupees________________________only) to IRCTC in accordance with the Tender Document.

9. I/We agree to keep this offer valid for 120 (one hundred and twenty) days from the Bid Due Date specified in the Tender Document.

10. I/We hereby submit our Bid as mentioned below:
**Price Schedule**

**Location- ________________**

The Bidder shall quote the rates in the format given below.

**PART-(A) Manufacturing Cost per 1 litre bottle (Ex plant):**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Basic Rate (exclusive of Taxes) (Rs.) $^1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In figure</td>
</tr>
<tr>
<td></td>
<td>In words</td>
</tr>
</tbody>
</table>

**PART-(B) Cost of Distribution per 1 litre bottle:**

- **Cost of CFA (inclusive of transportation cost upto 35 km) per bottle (Exclusive of Taxes) $^2$**
  
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Rate (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In figure</td>
</tr>
<tr>
<td></td>
<td>In words</td>
</tr>
</tbody>
</table>

- **Cost of transportation for every additional km beyond 35 km: Rs. 0.003 per bottle per km (Exclusive of Taxes) $^2$**

**Note:**

1. Tenderers will ensure that full benefit of input tax credit (ITC) likely to be availed by them is duly considered while quoting rates.
2. Taxes as applicable on manufacturing cost (Part A) and cost of distribution (Part B) under GST will be paid extra.
3. The DCO will bear all other taxes like municipality, State, National except those explicitly mentioned above.

We have reviewed all the terms and conditions of the Tender Document including the Draft Contract Agreement and undertake to abide by all the terms and conditions contained therein. We hereby declare that there are, and shall be, no deviations from the stated terms in the Tender Document.

Yours faithfully,

For and on behalf of *(Name of Bidder)*

*Duly signed by the Authorised Signatory of the Bidder*  
*(Name, Designation and Address of the Authorised Signatory)*

**Note 1:** Total price (i.e. price quoted for part A + Part B) will be considered for the purpose of evaluation of bid  
**Note 2:** All pages of financial proposal to be signed by Authorised Signatory
12. PROJECT INFORMATION MEMORANDUM

12.1 Background

The Indian Railway Catering and Tourism Corporation (IRCTC), a subsidiary of the Indian Railways, has been mandated by Indian Railways to cater to the demand for packaged drinking water at railway stations and trains of Indian Railways. Currently IRCTC produces packaged drinking water under its “Rail Neer” brand at six locations Delhi, Patna, Chennai, Mumbai, Amethi, Parassala & Bilaspur with a total installed capacity of approximately 8.3 lakh bottles (1 liter) per day. The construction of three more plants at Nagpur (installed capacity of 0.72 lakh bottles/day), Sankrail & Hapur (installed capacity of 01 lakh bottles/day each) is currently underway. IRCTC presently caters to ~25% of the demand from Indian Railway and meets the remaining demand by procurement from other brands.

Given the large and growing market potential for packaged drinking water at Indian Railways, IRCTC has planned expansion of bottling operations of its packaged drinking water brand - Rail Neer by addition of few more green field plants at identified sites i.e. Ambala, Farakka, Nasik, Jagi Road, Jaipur, Ahmedabad, Nagpur, and Vijayawada. IRCTC intends to appoint Developer cum Operator for two packaged drinking water plants under PPP model.

12.2 Project Details

IRCTC has already procured land for 04 locations i.e. from State Industrial Corporations at Industrial Area, Mandideep Phase-II, Dist. Raisen (MP), from GIDC Sanand-II (near Ahmedabad), from MIDC Dhule at Bhusawal & from State Government at Jagi Raod (near Guwahati) and the procurement of land is in process for 03 locations i.e. Mallavalli (near Vijayawada), Patratu (near Ranchi) & Maneri - Dist. MANDLA (near Jabalpur). In case plot is of larger area, the required size will be earmarked for setting up plant activities. The built-up area in the location should be sufficient to house the plant, office and storage space to accommodate at least 6 days of stock.

12.3 Typical process flow

A typical process flow in a packaged water plant is made of 4 major subunits: the water purification process, the bottling plant, the packaging unit and the storage & distribution unit. The plants are proposed to be fully automatic implying that there is to be no human contact from the stage of loading preforms to the stage of capping of the water bottles.

The following figure showcases the suggested process for the plant. The process is only a suggested option, with the approval of IRCTC, the selected operator can make modifications in the same as long the final outputs comply with BIS and IRCTC standards.
In the water treatment unit, an eight stage filtration process is suggested using reverse osmosis technology or higher technology. However, the process may be modified depending on the quality of water available at the sites, if quality standards of final product are assured. Technical design of process and plant must be approved by IRCTC.

12.3.1 Recommended technology-

The contract would be expected to install a fully-automated drinking water bottling plant based on Reverse Osmosis (RO) or superior technology. Fully automatic plant would mean that there would no human touch from the stage of loading preforms in bottle blowing machine to the stage of filling and capping of the water bottles.

12.4 Project Implementation framework

The arrangement is envisaged for a period of 10 years and 8 months wherein 8 months is envisaged for completion of construction activity (including obtaining BIS certification and all approvals) and 10 years towards operations.

12.5 Scope of work of the Contractor: The scope of work envisaged for the contractor is discussed in brief below.
12.5.1 Investment activities of the Contractor

The DCO will be responsible of the designing of the PDW plant followed by the building activity involving procurement of material, engineering, civil construction and installation of equipments. The plant would have to be designed and built to suit the specifications mandated by IRCTC. The DCO will be responsible for obtaining all required approvals for the plant.

12.5.2 Operations of the plant and distribution of finished product

The procurement of all raw materials required for production of packaged drinking water shall be the responsibility of the DCO. The final product would be bottled in 1 liter PET bottles normally and distributed to catering units is station premises. The plant should have capability to package in different bottle sizes. The plant is expected to meet the following requirements for the purpose of Quality Control:

1. The plant shall have a fully-staffed house lab to test water quality during each of the stages of water treatment. This is to ensure that the final product meets Quality norms given in BIS specification IS 14543: 2004.
2. IRCTC shall have right to check quality of product/Raw material by regular/periodic inspection by deputing authorized representative in plant or by picking samples from market/sale point.
3. The plant may also be subject to periodic inspection by senior officers from IRCTC or other authorized representatives.
4. Inspections must be undertaken periodically to check for the proper functioning of the various monitoring and measuring instruments in the plant.
5. Basic housekeeping is a requirement to maintain hygienic conditions in the shop floor area, storage area, and utility facility area.
6. Log sheets, performance reports, equipment history, power consumption register, inventory registers, laboratory test reports and other necessary documentation must be maintained.

12.5.3 Technical specifications

Broad technical specifications and operational parameters of the fully automatic plant shall be advised in Tender Document. The contractor would have to take the approval of IRCTC on the final design and layout of building and machinery/plant along with make (of the machinery and plant) before starting the process of setting up of plant.

12.5.4 Other obligations of the contractor

The contractor shall ensure proper storage and stacking of finished goods. For all equipments of the plant, the contractor shall ensure compliance of manufacturers recommended preventive maintenances schedules/overhaul practices, which includes replacement of spares where ever recommended. The contractor shall maintain adequate documentation of the same to know about general health of the plant and also for information of IRCTC.
The contractor shall ensure upkeep of all necessary documentation and records such as log sheets charts, performance registers, inventory registers, equipment history, power consumption, laboratory test reports, daily, weekly, monthly, performance reports, chemicals and reagents consumption reports and all such other related documentation as advised by IRCTC.

The contractor shall comply with all the labour laws and other statutory laws.

IRCTC will post a minimum set of own staff at such plant (around 8-10 persons), who shall ensure proper dispatch of PDW to various destinations and also have quality monitoring system. Required office accommodation shall be provided by DCO.

12.6 Obligations of IRCTC

12.6.1 Land acquisition

IRCTC would be responsible to acquire the land for the project from Indian Railways or any other sources.

12.6.2 Assured Demand

IRCTC will take assured demand of packaged drinking water (PDW). The final terms are communicated in the Tender Document.

12.6.3 Seasonality variations

The highest demand for bottled water by IRCTC is expected to be in peak summer and holiday seasons. For this purpose, the DCO must ensure stocking of Rail Neer in sufficient quantity in advance.

12.6.4 Pricing

The pricing would be the basis of the bid, the terms and condition related to pricing are communicated in the Tender Document.

12.6.5 Supply of raw material

In case IRCTC wishes to produce/source the preform or any other raw material at a future date, IRCTC reserves the right to supply the preforms or any such raw material to the DCO at prevailing market rates.
12.7 Details of sites and Maps

1. Mandideep, Dist. Raisen (MP)

The required land from M.P. Audyogik Kendra Vikas Nigam (Bhopal) at industrial Area, Mandideep, Phase-II, Dist. Raisen (MP) admeasuring 5189.60 sq. mt. for purpose of setting up Rail Neer Plant has already been purchased. The site is at a distance of 27 kms from Bhopal. The required quantity of raw water will be supplied by MPAKVN on chargeable basis @ Rs. 24.50 per kilo ltr. (2014-15 rates) subject to revision by concerned authority.
2. Sanand-II, Ahmedabad

The land identified for setting up of Rail Neer Plant is at Sanand – II, Industrial area Ahmedabad in Gujarat. The area of the land is approximately 5000 sqm. The site is at a distance of 44 kms from Ahmedabad. Source of water will be Canal Water/water from State Government on chargeable basis @ Rs. 50/- per kilo ltr. (2017 rates) subject to revision by concerned authority.
3. Bhusawal

The land identified for setting up of Rail Neer Plant is at Bhusawal Industrial Area. The area of the land is approximately 8000 sqm. The site is at a distance of 08 kms from Bhusawal Railway Station. Source of water will be ground water. The required quantity of raw water will be supplied by MIDC on chargeable basis presently @ Rs. 49.75 per kilo ltr. subject to revision by concerned authority.
4. **Jagi Road (near Guwahati)**

The land identified for setting up of Rail Neer Plant is at Jagi Road (village Borkhal under Uttar Khola Mouza, Dist. Morigaon) near Guwahati in Assam. The area of the land is approximately 5 Bigha 1 Katha 15 Lessa (approximately 7000 sq. mtr). The site is at a distance of 55 kms approx. from Guwahati. Source of water will be Ground Water.
5. **Mallavalli (near Vijayawada)**

The land identified for setting up of Rail Neer Plant is at Kotha Mallavalli Dist. Krishna near Vijayawada in Andhra Pradesh. IRCTC is in process of procurement of land. The site is at a distance of 46 kms from Vijayawada. Source of water will be from State Government on chargeable basis or ground water.

![Map of Mallavalli](image)

6. **Patratu (near Ranchi)**

The land identified for setting up of Rail Neer Plant is at Patratu Industrial State near Ranchi in Jharkhand. IRCTC is in process of procurement of land. The site is at a distance of 43 kms from Rachi. Source of water will be from State Government on chargeable basis.

![Map of Patratu](image)
7. IGC Maneri Dist. Mandla (near Jabalpur)

The land identified for setting up of Rail Neer Plant is at Mendhi (Aydyogik Vikas Kendra Maneri Dist. Mandla) near Jabalpur in Madhya Pradesh. IRCTC is in process of procurement of land. The site is at a distance of 33 kms from Jabalpur. Source of water will be from State Government on chargeable basis.
TECHNICAL SPECIFICATIONS FOR CIVIL WORK

13.1 Name of work:- Civil Work for the Construction of Rail Neer Plants at Mandideep (near Bhopal), Dist. Raisen (MP), Sanand-II (near Ahmedabad), Bhusawal, Jagi Road (near Guwahati), Mallavalli (near Vijayawada), Ranchi, Maneri - Dist. Mandla (near Jabalpur)

13.2 Material & Specifications:

While executing the work, CPWD Standard Specifications for material and works shall be followed. In addition to this, relevant ISI Code mentioned in item description, Special Data & Specifications issued from time to time shall also be applicable.

13.3 Brick Work
13.3.1 Bricks:

(a) The bricks shall be table moulded first quality of regular and uniform size, shape and colour, uniformly well burnt throughout but not over burnt. They shall have plane rectangular faces with parallel sides and sharp straight and right angled edges. They shall be free from cracks or other flaws. They shall have a frog of 10mm depth on one of their flat faces.

(b) They shall give a clear metallic ringing sound when struck.

(c) They shall show a fine grained, uniform, homogeneous and dense texture on fracture and be free from lumps of lime, lamination, cracks, air holes, soluble salts causing efflorescence or other defects which may in any way impair their strength, durability, appearance or usefulness for the purpose intended. They shall not have any part under burnt. They shall not break when thrown on the ground on their flat face in a saturated condition from a height of 60 cm.

(d) The size of brick shall be 23 x 11.5 x 7.5cm. Only bricks of one standard size shall be used on one work unless specially permitted by the architects / clients engineer. The following tolerances are permitted in the standard conventional size adopted on a particular work.

<table>
<thead>
<tr>
<th>Length</th>
<th>3mm (about 1/8”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breadth</td>
<td>1.5mm (about 1/16”)</td>
</tr>
<tr>
<td>Depth</td>
<td>1.5mm (about 1/16”)</td>
</tr>
</tbody>
</table>

(e) After immersion in water, absorption by weight shall not exceed 20% of the dry weight of the brick when tested according to ISS No. 1077 - 1986.

(f) Unless otherwise specified the lead to crush the brick when tested according to ISS No. 1077 - 1986 shall not be less than 35 Kg/Sqm.

13.3.2 Mortar:

Unless otherwise specified, mortar for brick work shall be composed of 1 part of cement to 5 parts of coarse approved sand for walls of one brick thick (i.e., 23 cms) and over and one part of cement to 4 parts of coarse approved sand for half brick thick wall. Other specifications for mortar in brick work shall be as per ISS No. 2116 - 1965.

13.3.3 Construction Details:
(a) **Soaking:** All bricks shall be immersed in water minimum for two hours before being put into work so that they will be saturated and will not absorb water from the mortar.

(b) **Bats:** No bats or cut bricks shall be used in the work unless absolutely necessary around irregular openings or for adjusting the dimensions of different course and for closers, in which case, full bricks shall be laid at corners, the bats being placed in the middle of the courses.

(c) **Laying:** The bricks shall be laid in mortar to line level and shapes shown on the plans, slightly pressed and thoroughly bedded in mortar all joints shall be properly flushed and packed with mortar so that they will be completely filled with mortar and no hollows left anywhere. Bricks shall be handled carefully so as not to damage their edges. They should not also be thrown from any height to the ground but should be put down gently. All courses shall be laid truly horizontal and all vertical joints made truly vertical. Vertical joints in one course and the next below shall not come over one another and shall not normally be nearer than quarter of a brick length. For battered faces bedding shall be at right angles to the face. Fixtures, plugs, frames etc. if any, shall be built in at places shown in the plans while laying the courses only and not later by removal of brick already laid.

Care shall be taken during construction to see that edges of bricks at quoins, sills, heads, etc. are not damaged.

The vertically of the walls and horizontally of the courses shall be checked very often with plumb - bob and spirit level respectively.

(d) **Bond:** Unless otherwise specified, brick work shall be done in English bond.

(e) **Joints:** Joints shall not exceed 10mm (about 3/8”) in thickness and this thickness shall be uniform throughout. The joints shall be raked out not less than 10mm (about 3/8”) deep when the mortar is green where pointing is to be done. When the brick surfaces are to be plastered, the joints shall be raked to a depth of 5mm when the mortar is green, so as to provide good key to plaster.

(f) **Uniform Raising:** Brick work shall be carried out regularly in all cases where the nature of work will admit, not leaving any part 60cm, lower than another. But where building at different levels is necessary, the breaks shall be stepped so as to give later a uniform and effectual bond. Horizontal courses should be to line and level and even and face plumb or to batter as shown on the plan.

13.3.4 **Scaffolding:** Scaffolding will be double or single as is warranted for the particular work.

Putlog holes shall be made good by bricks to match the face work when putlogs are removed after ensuring that the holes behind are solidly filled in with 1:4:8 cement concrete.

13.3.5 **Curing:** All brick work shall be kept well warranted for 14 days after laying. Where pozzolana cement is allowed to be used for mortar the curing shall be extended by one week at the contractor’s expenses.

13.3.6 **Exposed Work:** Where exposed brick is specified, the usual specifications for the ‘Brick work’ as mentioned above will be applicable for ‘Exposed Brick Work’ but in
addition specially selected bricks shall be used for facing, ensuring regular and clean faces of uniform colour. No bricks which are broken, chipped, wrinkled or which have irregular edges or corners shall be used. Depending on the quality of bricks and if instructed by the architects/clients engineer the exposed face of every brick shall be rubbed before laying without extra charge. Wooden fillets 10mm thick and 10mm wide shall be placed at the edge of joints so that no mortar comes on the surface of the bricks and a regular thickness of joints is maintained. The surface shall be rubbed down with brushes on bricks if necessary, and thoroughly washed. No mortar shall be allowed to stick to the surface, which shall be left clean to the architects / clients engineers’ satisfaction with all joints even and true to a straight line. Double scaffolding shall be used in exposed brick work.

13.3.7 Reinforcement In Half Brick Thick Walls: Half brick thick and brick on edge walls shall be provided with reinforcement consisting of 2 Nos. of 6mm dia. M.S. round bars of 500mm long (each) as dowels, embedded mortar 15mm thick at every fourth course and securely anchored at their ends, where the partition bonds with the cross walls. The cost of reinforcement in half brick wall and brick on edge wall shall be paid separately unless otherwise stated in the Schedule of Quantities.

13.4 Wood Work and Joinery

13.4.1 Timber:

I. TW shall mean Teak Wood of good quality, well seasoned, uniform colour, reasonably straight grains, free from cracks and shakes. Wood shall be generally free from sapwood. Maximum moisture content shall not exceed 10 per cent with tolerance limit for Average moisture content of all the samples in a given lot + 2 percent of moisture content of individual sample +3 per cent of the maximum permissible moisture content.

Generally wood shall be free from knots, however, wood with knots may be permitted provided individual hard and sound knot shall not be more than 40mm in diameter and aggregate area of all the knots shall not exceed one and half percent of the area of the place.

Teak wood shall be approved before incorporating in the work. Contractor should ensure that wood work does not warp or show other defects due to lack of proper seasoning.

II. All timber for carpentry and joinery in touch with masonry or concrete shall be coal tarred or creosoted before fixing. All rough frame work in partitions, suspended ceilings and veneering to walls etc. shall be treated with approved wood preservative ‘Bison or other equivalent and approved as per manufacturer’s instructions and specifications.

III. All fully fabricated timber shall be air seasoned for a period of not less than two months to allow for any shrinkage that may take place. The preparations of timber for joinery is to commence simultaneously with the beginning of the project work generally and should proceed continuously until all the wood work is prepared and fixed / stacked on or near the site as the case may be.
13.4.2 **HOLDFASTS:** Three holdfasts shall be fixed to each post of the door frame and two to each post of the window frame. Unless otherwise mentioned in the item, the MS holdfasts shall be of the size 300mm x 35mm and 6mm and shall be fixed to the frames by means of screws and not nails. The other end of the holdfast shall be fixed into jambs within 1:2:4 PCC of dimensions as directed.

Whenever asked for rawl plugs or bolts as directed shall be used for rough grounds framing, hangers etc.

13.4.3 **WORKMANSHIP AND CONSTRUCTION :**

(I) The workmanship shall be first class and to the approval of the architects / clients engineer scantlings and boardings shall be accurately sawn and shall be of required width and thickness. All carpenter’s work shall be wrought except where otherwise described. The workmanship and joinery shall be accurately set out in strict accordance with the drawings and shall be framed together and securely fixed in approved manner and with properly made joints. All work is to be properly tenoned, shouldered, wedged, pinned, bradded etc. and properly glued with approved quality glue to the satisfaction of the architects / clients engineer.

(II) **SCREWS:** All screws to be used in wood work and joinery shall be of brass and not iron.

(III) **TOLERANCES:** 1.5mm (1/6") will be allowed for each wrought face of the sizes specified except where described as “finished” in which case they shall hold to the full dimensions.

(IV) **PROTECTION:** All wood work and joinery edges of timber frames etc. shall be protected from being damaged during construction by the contractor.

(V) If it is decided by the employer to provide antitermite treatment, the building contractor shall co-ordinate his work suitably as directed by the architects/ clients engineer.

(VI) Door / window frames shall have cut rebates. Planted rebates shall not be permitted.

13.4.4 **WOODEN FLUSH DOOR SHUTTERS (SOLID CORE TYPE):** Solid core flush shutters shall be as specified in the item and approved quality. An approved sample shall be deposited in the office of the architects/clients engineers on site for reference. The shutters will be provided with lipping, finished thickness of the shutter shall be as mentioned in the item.

13.4.5 **TEAK WOOD PANELLED SHUTTERS:** Solid wood panels for shutter shall be of pattern and size specified. Wherever possible each panel shall be in a single width piece. But where two pieces are used, width of each piece should not be less than 12.5cm. In order to avoid wrapping, splitting and cracking, normally pieces not exceeding 20cm in width should be used.

When made from more than one piece, the pieces shall be jointed with a continuous tongued and grooved joint and glued together and reinforcement with metal dowels. The grains of solid panel shall run along the longer dimension of the panel. Panels shall be framed into grooves to the full depth of the groove leaving an air space of
1.6mm and the faces shall be closely fitted to the sides of the groove. Mouldings to the edge of panel openings shall be scribed at the joints.

13.4.6 FIXTURES AND FASTENINGS: Unless otherwise specified in the Schedule of Quantities each shutter shall be hung with three brass butt hinges of approved quality size and make with brass screws. Unless otherwise specified in the Schedule of Quantities other fittings, if ordered shall be paid separately as prime cost items.

13.4.7 FINISHING: The wood work shall be finished by 3 coats of painting. French polishing or wax polishing as specified in the item.

13.5 BRICK ON EDGE SOLING

13.5.1 BRICKS: The bricks unless otherwise specified shall be locally available overburnt bricks and shall be approved, sound, hard, tough, durable, dense, clean, free from soft spots, cracks, decay and other defects. Brick bats shall not be used.

13.5.2 PREPARATION OF SUB - GRADE: All the fittings shall be watered and compacted to get maximum consolidation. All necessary trimming or filling for the laying of the soling in line and required grade shall be done. The subgrade shall be marked by stakes and strings for the required depth for laying of the soling.

13.5.3 LAYING SOLING: The bricks shall be laid on edge (unless otherwise specified) touching each other. Bricks shall be laid in parallel rows breaking bond or in Herringbone bond pattern as directed. All bricks shall be laid closely in position and firmly embedded, true to line and gradient as required the joints shall be filled by sand as directed.

13.5.4 CONSOLIDATION: The soling shall be watered and rammed with wooden rammers of approved weight. The brick soling shall not be rammed with heavy iron rammers as the bricks are likely to be crushed. Ramming shall continue till closely knit compacted surface conforming to the required levels is obtained. Earth on no account shall be used for making good or blinding purposes and if approved by architects / clients engineer, sand shall be used for blinding purposes. Water shall be lightly sprinkled if required and directed.

13.6 CEMENT CONCRETE FLOORING AND CEMENT SKIRTING OR DADO PLAIN CEMENT CONCRETE FLOORING IN SINGLE LAYER

13.6.1 CEMENT CONCRETE: Unless otherwise specified, the proportion of cement concrete shall M 15 (cement fine aggregate: coarse stone aggregate of size 12mm and below by volume. Cement however, shall not measured in volume but by weight. One bag of cement of 50 Kgs shall be assumed to contain 35 litres of cement i.e., 1.20 Cft). The coarse aggregate shall be from approved source, carefully selected, sufficiently tough and hard stone pieces broken in a manner that will provide particles of approximate cubical shapes affording good interlocking. Elongated or thin flake like fragments should be avoided. The maximum size of coarse aggregate shall be 12mm.
The fine aggregates shall be sand from approved source and consist of properly graded particles. The coarse and fine aggregates shall be conforming to relevant IS 383 - 1970 and shall be washed clean if necessary.

Unless otherwise mentioned in the item concrete in flooring shall be 40mm thick. The least amount of mixing water that will produce a workable mix and will allow finishing without excessive trowelling shall be used. Generally a water cement ratio of 0.5 should suffice.

13.6.2 PREPARATION OF SUB - GRADE: Before placing the concrete flooring the sub grade shall be got approved by the architects / clients engineer. The top surface of the sub - grade, shall be thoroughly cleaned of the dirt, loose particles, cake mortar droppings and laitance, if any by scrubbing with coir or steel wire brush or by hacking if necessary. The top surface of sub grade shall be slightly rough and shall have the required slope. The sub grade shall be moistened before laying the concrete flooring without forming any pools of water.

13.6.3 LAYING: The concrete flooring shall be laid in alternate bays not exceeding 2 x 2m each. The edge of each panel into which the floor is divided should be supported by flat iron or wood duly oiled to prevent sticking. Their depth shall be same as that proposed for the concrete flooring as mentioned in the item. The flat iron should be removed before filling in the adjoining panels. At least 48 hours shall elapse before the concreting in the adjoining bays is commenced. AC./glass strips or approved separators shall be provided if specified in the item. The concrete shall be laid immediately after mixing. While being placed the concrete shall be vigorously sliced and spaded with suitable tools to prevent formation of voids or honeycomb pockets. The concrete shall be brought to the specified levels by means of a heavy straight edge resting on the side forms and drawn ahead with a sawing motion in combination with a series of lifts and drops alternating with small lateral shifts. While concreting the adjacent bays, care shall be taken to ensure that the edges of previously laid bays are not broken by careless or hard tamping. Immediately after laying the concrete, the surface shall be inspected for high or low spots and any needed correction shall be done by adding or removing the concrete. After striking of the surface to the required grade, it shall be compacted with wooden float. The blows shall be fairly heavy in the beginning but as consolidation takes place, light rapid strokes shall be given to complete the ramming. The floating shall be followed by steel trowelling after the surface has hardened sufficiently to prevent excess of fine material from working to the surfaces. The finish shall be brought to a smooth and even surface, free from defects and blemishes and tested with straight edges and mason’s spirit - level to detect any inequalities in the surface which, if any, shall be made good immediately. No dry cement or mixture of dry cement and sand shall be sprinkled on the surface of concrete to absorb moisture or to stiffen the mix. The junctions of floor and walls shall be rounded off if so directed without extra payment. No extra mortar shall be laid over the concrete to make the floor in level. If broom finish is specifically mentioned in the item, the surface shall be obtained rough with parallel broom marks before the concrete sets.

After the concrete in the bays has set, the joints of the panels shall be filled with cement paste as directed. The joints shall be straight both ways i.e., along the length and width.
The vertical edge of the bays shall be neatly marked on the surface with a pointed trowel after filling the joints.

13.6.4 CURING: The surface shall be protected from direct sun when it is green. As soon as the surface has hardened sufficiently to prevent damage to it, it shall be kept continuously moist for at least 14 days by means of wet gunny bags, 50mm thick layer of damp sand spread over the surface or pooling water on the surface.

13.6.5 CEMENT DADO AND SKIRTING:

(a) PREPARATION OF SURFACE: The walls to which skirting or dado is to be done shall have all the joints raked out to a depth of 10mm, if not already done RCC surface shall be properly hacked to get good key to the mortar. All dust and oily matter, if any, shall be brushed and cleaned and the surface shall be kept wet for 6 hours before the dado or skirting work commences. The dado or skirting work shall not be commenced unless the preparatory work is passed by architects / clients engineer.

(b) CEMENT MORTAR: Unless otherwise mentioned the proportion of mortar shall be 1:3 (1 cement: 3 sand). Sand in mortar shall be as per IS: 1542 - 1977 as applicable to internal wall plastering and washed clean if necessary. The thickness of dado or skirting shall be 20mm thick unless otherwise specified.

(c) APPLICATION: The mortar shall be firmly applied with somewhat more than the required thickness and well pressed, rubbed and leveled with a flat wooden rule to give required thickness. Long straight edges shall be freely used to ensure perfectly plane and even surface. No dry cement or mixture of dry cement and sand shall be sprinkled directly on the surface to absorb moisture or to stiffen the mix. The mortar shall adhere to the surface intimately when set and there should be no hollow sound when struck. All corners, angles and junctions shall be truly vertical and horizontal as the case may be, carefully and neatly finished. Care shall be taken to see that the top edge of the skirting or dado shall be straight in line and square and joined with plaster above as mentioned.

When neat cement finish is specified over the plaster surface, a coat of pure Portland cement slurry, 1.5mm thick shall be applied and well rubbed to the plaster surface while the plaster surface is still fresh. When the finish is specified, the plastered surface shall be rubbed well to an even plane with a wooden float for external surface and finished smooth with a steel trowel for internal surface.

If coloured dado or skirting is required, approved coloured cement or cement mixed with the required shade of approved pigment shall be used.

(d) CURING: The dado or skirting shall be kept wet for 14 days.

13.7 CERAMIC/GLAZED TILES IN FLOORING AND DADO

13.7.0 FLOORING:

13.7.1 TILES: Tiles including specials shall be of approved make and quality and shall conform to IS 777 - 1970 in all respects. Samples of tiles shall be got approved by the architects/clients engineer, who will keep them in his office for verification as to whether the materials brought for use conform to the approved samples.
13.7.2 MORTAR BEDDING: The amount of water added shall be minimum necessary to give just sufficient plasticity for laying and satisfactory bedding. Care shall be taken in preparing the mortar to ensure that there are no hard lumps that would interfere with the even bedding of the tiles. Before spreading mortar, sub-floor or base shall be cleaned of all dirt, scum, loose materials and laitance if any, by scrubbing with coir or steel wire brush or by hacking if necessary and then well wetted without forming any pools of water on the surface. Before laying the mortar, the sub grade shall be got approved by the architects / clients engineer. In case of RCC floors, the top shall be left a little rough. All points of level for the finished paving surface shall be marked out. The mortar shall then be evenly and smoothly spread over the base by the use of screed battens only over so much area as will be covered with tiles before the setting of the mortar. The thickness of the mortar bed shall not be less than 15mm and not more than 25mm. Unless otherwise specified, the proportion of mortar bedding shall be as specified in the item. Sand for mortar bedding shall be from approved source, and shall conform to IS No. 2116 - 1965 as applicable to unreinforced masonry work.

13.7.3 LAYING, FINISHING, CURING AND CLEANING: The tiles before laying shall be soaked in water for at least two hours. Tiles which are fixed in the floor adjoining the wall shall be so arranged that the surface of the round edge tiles shall correspond to the skirting or dado. Neat cement grout of honey like consistency shall be spread over the bedding mortar just to cover so much area as can be tiled within half an hour. The edges of the tiles shall be smeared with neat white cement slurry and fixed in this grout one after the other, each tile being well pressed and gently tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. There shall be no hollows in bed or joints. The joints shall be kept as close as possible and in straight lines. The joints between the tiles shall not exceed 1.5mm wide. After fixing the tiles finally in an even plane, the flooring shall be covered with wet saw dust. The tile flooring shall be cured for 14 days.

After the tiles have been laid in a room or the day’s fixing work is completed the surplus cement grout that may have come out of the joints shall be cleaned off before it sets. Once the floor has set the floor shall be carefully washed clean and dried. When dry, the floor shall be covered with oil free dry saw dust which shall be removed only after completion of the construction work and just before the floor is occupied.

13.7.4 GLAZED TILES DADO:

(a) TILES: Glazed tiles shall be same as described under white glazed tiles flooring.

(b) MORTAR BACKING: All joints in the face work shall be raked out to a depth equal to not less than the width of the joints or as directed by the architects/clients engineer. Concrete surfaces shall be properly hacked. All dirt, soot oil, or any other material that might interfere with satisfactory bond shall be removed. The surface shall be cleaned and scrubbed with fresh water and kept wet for six hours prior to applying backing mortar. The dado work shall not be commenced unless the preparatory work is passed by the architects/clients engineer. The proportion of mortar for backing shall be 1:3 cement mortar. Sand in mortar bedding shall be from approved source, and shall conform to IS: 1542: 1977 as applicable to internal wall and ceiling plastering and external wall plastering. The thickness of mortar backing shall not be less than 12mm and not more than 20mm.
(c) **FIXING DADO TILES:** Dado work shall be done only after fixing tiles on the floor. The white glazed tiles shall be soaked in water for at least two hours before being used for dado work. Tiles shall be fixed when the cushioning mortar is still plastic and before it gets very stiff. The back of tiles shall be covered with a thin layer of neat cement paste and the tile shall then be pressed in the mortar and gently tapped against the wall with a wooden mallet. The fixing shall be done from bottom of wall upwards without any hollows in the bed or joints. Each tile shall be fixed as close as possible to the one adjoining. The tiles shall be jointed with white cement slurry. Any difference in the thickness of tiles shall be evened out in cushioning mortar so that all tiles faces are in one vertical plane. The joints between the tiles shall not exceed 1.5mm in width and they shall be uniform. While fixing tiles in dado work, care shall be taken to break joint vertically. After fixing the dado, they shall be kept continuously wet for 14 days. If doors, windows or other openings are located within the dado area, the sills, jambs, angles etc. shall be provided with white glazed tiles and appropriate specials according to the foregoing specification and such tiled area shall be measured net along with the dado.

(d) **CLEANING:** After the tiles have been fixed the surplus cement grout that may have come out of the joints shall be cleaned off before it sets. After the complete curing, the dado or skirting work shall be washed thoroughly clean.

### 13.8 POLISHED KOTAH / SHAHABAD / TANDUR STONE FLOORING, DADO / LINING AND SKIRTING FLOORING

**13.8.1 STONE SLABS:** The stone slabs shall be hard, sound, durable, resistant to wear. Unless otherwise specified, stone slabs shall be square in shape 30 x 30cm size and 25mm thick. The stone slabs shall be without any soft veins, cracks of law and shall have a uniform colour. A tolerance of 3mm in thickness at any point shall be permitted. The exposed surface of stone slabs shall be machine polished to a smooth even and true plan and the edges to be chiselled to half its depth, true and square to ensure uniform width of joint. The edges of stone slabs shall be machine cut square to the required shape, if necessary. The stone slabs be of approved colours and shades. A few approved samples of stone slabs to be used shall be deposited by the contractor in the office of the architects / clients engineer.

**13.8.2 MORTAR BEDDING:** The amount of water added shall be the minimum necessary to give just sufficient plasticity for laying and satisfactory bedding. Care shall be taken in preparing the mortar to ensure that there are no hard lumps that would interfere with the even bedding of the stone slab.

Before spreading the mortar the sub floor or base shall be cleaned of all dirt, scum, loose materials, and laitance if any by scrubbing with coir or steel wire brush or by hacking if necessary, and then well wetted without forming any pools of water on the surface. Before laying the mortar, the sub grade shall be got approved by the architects / clients engineer. In case of PCC floors the top shall be left a little rough. All points of level for the finished paving surface shall be marked out. The mortar shall then be evenly and smoothly spread over the base by the use of screed battens, only over so much area as will be covered with slabs within half an hour. The thickness of the mortar bedding shall be given to the bed. The proportion of mortar bedding shall be as specified and 20mm thick average. Sand for mortar bedding shall be from approved source, and shall conform to IS No. 2116 - 1965 as applicable to unreinforced masonry work.
13.8.3 LAYING, CURING, POLISHING, FINISHING AND CLEANING: Before laying, the stone slabs shall be thoroughly wetted with clean water. Neat cement grout of honey like consistency shall be spread on the mortar bed over as much area as could be covered with the slabs within half an hour. The stone slabs shall be laid on the neat cement float and shall be evenly and firmly bedded to the required level and slope in the mortar bed. The stone slabs shall be laid in the approved pattern in single or two tone colour. Each stone shall be gently tapped with a wooden mallet till it is firmly and properly bedded. There shall be no hallows left. If there is a hollow sound on gentle tapping of the stone slabs, such stone slabs shall be removed and reset properly. The mason shall make the joint of uniform thickness and straight lines. The thickness of joints shall not exceed 1.5mm. The joints shall be grouted with neat cement slurry. No border stone slabs shall be less than 100mm in width, unless otherwise approved by the architects / clients engineer.

When the bedding and joints of the flooring have been completely set, the surface shall be machine polished to give a smooth, even and true plane to the floor and thoroughly cleaned.

13.8.4 DADO / LINING AND SKIRTING :

(a) The stone slabs shall be as specified above for flooring unless otherwise mentioned. The stone slabs shall be in approved lengths to match the flooring. The exposed edges of stone slabs such as in dado / lining and skirting, jambs, soffits, sills etc. shall be machine cut and polished smooth.

(b) MORTAR BACKING: All joints in the face work shall be raked out to a depth equal to not less than the width of the joints or as directed by the architects / clients engineer. Concrete surface shall be properly hacked. All dirt, oil, or any other material that might interfere with satisfactory bond shall be removed. The surface shall be cleaned and scrubbed with fresh water and kept wet for six hours prior to applying backing mortar. The dado/lining or skirting work shall not be commenced unless the preparatory work is passed by the architects/clients engineer. The proportion of mortar for backing shall be 1:3 CM. Sand in mortar bedding shall be from approved sources and shall conform to IS: 1542 - 1977, as applicable to internal wall and ceiling plastering and external wall plastering. The thickness of mortar backing shall not be less than 12mm and not more than 20mm.

(c) FIXING, DADO/LINING OR SKIRTING STONE SLABS: Dado/lining or skirting shall be done only after fixing stone on the floor. The stone slabs shall be thoroughly wetted in water before being used for dado/lining or skirting work. The stone slabs shall be fixed when the backing mortar is still, plastic and before it gets stiff.

All the stone slabs shall be covered with an additional layer of neat cement paste and stone shall then be pressed in mortar and gently tapped against the wall with wooden mallet. The fixing shall be done from the bottom of wall upwards without any hallows in the beds or joints. Each stone slab shall be fixed as close as possible to the adjoining stone slab. The stone slab shall be jointed in neat cement slurry to match the colour of the stones. The joints shall not exceed 1.5mm in width and they shall be uniform. While fixing the stone slabs in dado / lining or in skirting work, care shall be taken to see that the joints in the adjoining flooring below, matches with the joints in the dado / lining or in skirting, as the case may be, or shall be staggered as directed. When
specified brass clamps and pins etc. of approved size shall also be used for fixing dado/lining.

(d) **POLISHING:** When stone slabs are completely set, polishing shall be done by hand with approved type of polishing stone. A smooth and even polished surface shall be obtained to match the finished surface of the flooring.

(e) **CURING:** The dado / lining or skirting shall be kept wet for 14 days.

### 13.9 CAST IN SITU MARBLE MOSAIC FLOORING, DADO AND SKIRTING

#### 13.9.1 CAST IN SITU MARBLE MOSAIC FLOORING:

(I) **PREPARATION COMPOSITION:** The sub-grade shall be prepared as for in cement concrete flooring.

(II) **FLOORING COMPOSITION:** This will compose of two layers, the bottom one called the “under coat” and the top one called the “top coat”. The bottom coat shall be 28mm thick and the top coat shall be 8 to 10mm thick. The total thickness shall be regulated to 36 to 38mm unless otherwise stated.

(a) **UNDER COAT:** The under coat will have the same proportion and consistency as for cement concrete flooring and shall be mixed and placed in the same manner, except that no finishing shall be done to make the surface smooth, the top surface of concrete in the under coat shall be kept sufficiently rough to form a key to the top coat.

(b) **ALUMINIUM STRIPS:** While laying the under coat, aluminium strips of 10 gauge and 36mm wide as separators shall be provided to form approved panels. The area of each panel in the flooring shall not exceed 1.5sqm, the longest side of any panel not exceeding 2 metres.

(c) **TOP COAT:** The grading proportion and colour of the marble chips shall be got approved from the architects / clients engineer after preparing a few samples of cast in situ mosaic flooring. The proportion of white cement, grey cement, coloured cement, pigments and marble chips in the top coat shall be got approved from the architects / clients engineer to get light shades, medium shades and dark shades, as required. The proportion of cement to marble chips shall be 1:2. The top coat shall be laid as per IS: 2114 - 1962.

(III) **POLISHING AND FINISHING:** After the top coat has hardened enough to prevent dislodgement of aggregate particles, the surface shall be machine polished and finally washed with ‘Tatri’ and then wax polished to give a smooth and shining surface.

(IV) **CURING:** The floor shall be kept covered and damp till it is properly set and given final finish.

#### 13.9.2 DADO AND SKIRTING:

(a) Dado and skirting shall be laid in two layers, the under coat being laid as plaster and the top coat with marble chips in white / grey / colour cement as required.

(b) **UNDER COAT:** The under coat shall be in 1:3 cement mortar and shall be applied to the wall surface as for plaster. The thickness of the plaster shall be 12mm for brick and concrete faces, and 20mm for stone faces. The surfaces of the under coat shall be kept
rough to form a key for the top coat of the marble chips in white / grey / coloured cement as required in difference proportions.

(c) ALUMINIUM STRIPS: Aluminium strips shall be provided minimum 10 gauge and width to suit the thickness of the dado (inclusive of top coat). The aluminium strips shall be fixed in plaster when it is green. Spacing of aluminium strips shall not exceed two metres.

(d) TOP COAT: This shall be similar to the top coat in cast in situ mosaic flooring.

(e) POLISHING: The finished surface shall be rubbed with Carborandum stone and finally washed with “Tatri” and then wax polished to get a smooth and shining surface. The surface shall be kept damp till it is properly set.

13.10 PLAIN OR COLOURED CEMENT TILES OR TERRAZZO TILE FLOORING DADO AND SKIRTING

13.10.1 FLOORING:

13.10.2 TILES: Plain or coloured cement tiles and terrazzo tiles shall be manufactured as per IS 1237 - 1959 using grey or white cement and pigments and marble chips of sizes as required. Tiles shall be of the size 250 x 250 x 20mm (10” x 10” x 7/8”) or any other approved size. Tiles shall be of approved colour, shade and make. A few approved samples of tiles to be used shall be deposited by the contractors in the office of architects / clients engineer.

13.10.3 CONCRETE BASE AND MORTAR BEDDING: The base of cement or lime concrete shall be laid and compacted to a reasonably true plain surface and to the required slopes and below the levels of the finished floor to the extent of the thickness of the tiles and mortar bedding. Cement concrete or lime concrete base shall be paid under a separate item. Lime surkhi mortar for bedding shall be prepared in a mortar mill. The amount of water added shall be minimum necessary to give, just sufficient plasticity for laying and satisfactory bedding. Care shall be taken in preparing the mortar to ensure that there are no hard lumps that would interfere with the even bedding of the tiles. Before spreading mortar, sub floor or base shall be cleaned of all dirt scum, laitance and all loose material and then well wetted without forming any pools of water on the surface. In case of RCC floors, the top shall be left a little rough. All points of level for the finished paving surface shall be marked out. The mortar shall then be evenly and smoothly spread over the base by the use of screed battens only over so much area as will be covered with tiles before the setting of the mortar. The thickness of the mortar bed shall not be less than 15mm and not more than 25mm. Sand for mortar bedding shall be as per ISS No. 2116 - 1965 as applicable to unreinforced masonry work.

13.10.4 LAYING, CURING, POLISHING, FINISHING & CLEANING: Before laying, the tiles shall be thoroughly wetted with clean water. Tiles shall be used as per approved pattern on the mortar bed and floated in neat cement slurry. The joints of the tiles shall not be more than 1.5mm wide and shall be filled with neat cement slurry of required colour to match the colour of tiles. If required, the border tiles shall be cut to proper sizes. No border tile shall be less than 100mm in width, unless otherwise approved by the architects / clients engineer.

Flooring shall be kept wet for 14 days.

Polishing and cleaning of the whole floor shall be done according to IS : 1443 - 1959.
13.10.5 DADO AND SKIRTING:

(a) Tiles shall be as specified above for flooring, except that in the case of skirting the height of tiles may be less than the height of 1 full tile.

(b) MORTAR BACKING: The proportion of mortar for backing shall be 1:3 cement mortar. Sand in mortar bedding shall be as per IS 1546 - 1960 as applicable for under coat of internal plastering.

(c) FIXING DADO OR SKIRTING TILES: Dado or skirting shall be done only after fixing tiles on the floor. The tiles shall be soaked in water before being used for dado or skirting work. The tiles shall be fixed when the backing mortar is still plastic and before it gets stiff. All the tiles shall be covered with an additional layer of neat cement paste and tiles shall then be pressed in mortar and gently tapped against the wall with wooden mallet.

The fixing shall be done from the bottom of wall upwards without any hollows in the beds or joints. Each tile shall be fixed as close as possible to the adjoining tile. The tile shall be jointed in neat cement slurry to match the colour of the tiles. The joints shall not exceed 1.5mm in width and they shall be uniform. While fixing the tiles in skirting or in dado work care should be taken to see that the joints in the adjoining flooring tile below matches with the joints in the skirting or the dado tiles, as the case may be, or shall be staggered as directed.

(d) POLISHING: Polishing may be done by hand machine with approved type of polishing stone. A smooth and even polished surface shall be obtained to match the finished surface of the flooring.

(e) CURING: The dado or skirting shall be kept wet for 14 days.

13.11 MARBLE FLOORING

13.11.1 MARBLE SLABS: The marble shall be of approved shade and sources as mentioned in the Schedule of quantities and their size and the thickness shall be as shown on the drawings and as approved by the architects / clients engineer. They shall be of selected quality, dense, uniform and homogeneous in texture and free from cracks or other structural defects. It shall have even and crystalline grains. The surface shall be machine polished to an even and perfectly plain surface and edges machine cut true and square. The rear face shall be rough enough to provide a key for the mortar. No slab shall be thinner than the specified thickness at its thinnest part. The dimensions of the slabs shall be as specified. A few approved samples of finished slabs to be used shall be deposited by the contractor in the office of the architects/client. Unless otherwise mentioned, the thickness of the marble shall be minimum 20mm.

13.11.2 CONCRETE BASE & MORTAR BEDDING: The base of cement concrete shall be laid and compacted to a reasonably true plain surface and to the required slopes and allow the level of the finished floor to the extent of the thickness of the slabs and mortar bedding. Cement concrete base shall be paid under a separate item. Cement mortar for bedding may be mixed manually or by a mechanical mixer as directed. The amount of water added shall be the minimum necessary to give just sufficient plasticity for laying and satisfactory bedding. Care shall be taken in preparing the mortar to ensure that there are no hard lumps that would interfere with the even bedding of the stones. Before spreading the mortar, sub floor or base shall be cleaned of all dirt, scum or laitance and
of loose material and then well wetted without forming any pools of water on the surface. In case of RCC floors, the top shall be left a little rough. All points of level for the finished paving surface shall be marked out. The mortar shall then be evenly and smoothly spread over the base by the use of screed battens only over so much areas as will be covered with slabs within half an hour. The thickness of the mortar bedding shall not be less than 12mm (about 1/2") not more than 25mm (about 1"). Unless otherwise specified the proportion of mortar bedding shall be as per ISS 2116 - 1965 as applicable to unreinforced masonry work.

13.11.3 **LAYING MARBLE SLABS:** Before laying, the marble shall be thoroughly wetted with clean water neat cement grout of honey like consistency shall be spread on the mortar bed over as much area as could be covered with the slabs within 1/2 an hour. The specified type of marble slabs shall be laid to pattern as directed on the neat cement float and shall be evenly and firmly bedded to the required level and slope in the mortar bed. Each slab shall be gently tapped with a wooden mallet till it is firmly and properly bedded. There shall be no hollows left. If there is a hollow sound on gentle tapping on the slabs, such slabs shall be removed and reset properly.

The joints shall be hair fine in width and in straight line grouted with neat coloured cement slurry to match the colour of the marble. The joints shall be struck smooth but there shall be no smearing over the mortar of the slabs. The edges of the adjoining slabs shall in one place.

13.11.4 The flooring shall be kept undisturbed at least seven days and wet for fourteen days. Marble flooring shall be given a final coat of wax polish of approved make

13.12 **EXTERNAL CEMENT PLASTER WITH SAND FACED / COMBED / ROUGH CAST FINISHES/SAND FACED FINISH:**

13.12.1 **PREPARATION OF SURFACE:** The walls to be plastered to have all joints raked out to a depth of 10mm, if not already done. RCC surface shall be properly hacked to get good key to the plaster. Any unevenness shall be levelled before the plastering is applied. All dust and oil matter, if any, shall be brushed and cleaned with a stiff bristle or wire brush, and the surface to be plastered shall be kept wet for six hours before plastering is commenced. If the surface becomes dry in spots such areas shall be moistened again to restore uniform suction.

13.12.2 **PROPORTION OF MORTAR:** Unless otherwise mentioned, the proportion of external cement plaster for brick or concrete surfaces shall be 1:4 (1cement: 4 sand). Sand shall be from approved source free from foreign matter, washed clean if necessary and shall be as per 1542 - 1977. No more cement mortar shall be prepared than that can be used within half an hour.

The mortar may be hand mixed or machine mixed. In hand mixed mortar, cement and sand in the specified proportion shall be thoroughly mixed on a clean impervious form by turning over at least three times or more till a homogeneous and mixture of uniform colour is obtained. Fresh and clean water shall be added gradually through a rose and thoroughly mixed so that mix becomes homogeneous and each particle of sand shall be completely covered with a film of wet cement. Mixing platform shall be so arranged
that no deleterious, extraneous material shall get mixed with mortar nor the mixing water of the mortar shall flow out.

13.12.3 APPLICATION OF PLASTER: The plastering shall be done in two coats namely under coat and finishing coat.

- **UNDER COAT:** The under coat shall be cement mortar 1:4. Water proofing compound of approved make shall be added according to manufacturer’s specifications to make the mortar waterproof. Patches of plaster 15cm x 15cm shall be put on about 3m, apart as gauges to ensure even plastering in one plane. The thickness of the under coat in any part shall not be less than 8mm and more than 12mm. The mortar shall be firmly applied with somewhat more than the required thickness and well pressed into the joints and on the surface and rubbed and levelled with a flat wooden rule to give required thickness. Long straight edges shall be freely used to ensure perfectly plane and even surface. All corners must be finished to their true angles or rounded as directed. Plastering shall be done from top downward. Keys shall be formed on the surface by thoroughly combing it with wavy horizontal lines about 12mm apart and 3mm deep when the mortar is still plastic. Under coat shall be cured for not less than 2 days before finishing coat is applied.

- **FINISHING COAT:** Cement mortar for finishing coat shall have washed approved sand with slightly larger proportion of coarse material. The proportion of cement to sand shall be 1:4. The finishing coat shall be of such thickness as to make total average finish to thickness equal to the required plaster thickness as to make total average finish equal to the required plaster thickness as described. The finishing coat shall be not less than 4mm or more than 8mm thick. The finished surface shall be true and even and shall present uniform texture throughout and all joining mark shall be eliminated. After application the surface should be finished with a wooden float lying with cork and tapped gently to retain coarse surface texture. A steel trowel shall not be used and overworking shall be avoided.

Water shall not be applied to the surface of the finishing coat while working up, but patches showing signs of premature drying may be patted with a damp float. When the finishing coat has hardened, the surface shall be kept moist continuously for 14 days. In any continuous face of wall, finishing coat should be carried out continuously and day to day breaks made to coincide with architectural breaks in order to avoid unsightly junctions.

All mouldings shall be worked true to template and drawn neat clean and level. All exposed angles and junctions with door frames etc. shall be carefully finished as directed.

13.12.4 CURING: All plaster work shall be kept damp continuously for a period of 14 days. To prevent excessive evaporation on the sunny or windward side of the buildings in hot dry weather, matting or gunny bags may be hung over on the outside of the plaster in the beginning and kept moist.

13.12.5 COMBED FINISH: All the specifications given above for sand finish shall apply to this as well except that in the case of combed finish, the finishing coat will be treated to have combed texture of approved pattern.
13.12.6 ROUGH CAST FINISH:

(a) All the specifications given above for sand faced finish shall apply to this as well except for the application of plaster which is described below.

(b) APPLICATION OF PLASTER: The plastering shall be done in two coats namely undercoat and finishing coat. The undercoat shall be done same as in case of sand faced finish. The finishing coat shall contain a fairly coarse aggregate and shall be thrown on as a wet mix and shall be left in rough condition. The mortar of the finishing coat shall consist of coarse aggregate of crushed stone or fine gravel of size generally 6 to 12mm as approved by architects / clients engineer and specially graded mixture, mixed with approved sand and cement.

The proportion of cement to sand and aggregate/gravel shall be generally 1:1-1/2:3. The mortar shall be flung upon the undercoat with large trowels to form an even protection coat. The finishing coat must be applied while the undercoat is still soffit and plastic. The thickness of the finishing coat shall be about 12mm unless otherwise specified.

13.13 WHITE WASHING, COLOUR WASHING AND DISTEMPERING

13.13.1 WHITE WASHING:

(a) MATERIAL: White wash shall be prepared from fresh burnt fat lime. The lime shall be dissolved in a tub with sufficient quantity of water (about 4/5 litres / Kg. of lime) and the whole thoroughly mixed and stirred until it attains the consistency of the cream.

The wash shall be taken out in small quantities and strained through a clean coarse cloth. Clean gum dissolved in hot water shall then be added in suitable proportion of two grams of gum arabic to a litre of lime to prevent the whole wash coming off easily when rubbed. Rice size may also be used instead of gum. Required neel colour be added for whiteness.

(b) SCAFFOLDING: This shall be double or single according to requirement and as directed. If ladders are used pieces of old gunny bags or cloth bags shall be tied on their tops and bottoms to avoid damage or scratches to the plastered surfaces and floorings etc. Proper stage scaffolding shall be erected when white washing the ceiling.

(c) PREPARATION OF SURFACE: The surface shall be prepared by removing all mortar droppings and foreign matter and thoroughly cleaned with hair or fibre brush or other means as may be ordered by the architects/clients engineer to produce an approved clean and an even surface. All loose pieces and scales shall be scrapped of and holes, cracks etc. stopped with mortar to match with the surrounding finish. In case where the surfaces have been previously white washed or colour washed, the old white or colour wash shall be entirely removed and surfaces broomed down before the new white wash is applied.

In case the old white wash cannot be removed by brooming, the surfaces shall be cleaned by scraping.

(d) APPLICATION OF WHITE WASH: On the surface so prepared, the white wash shall be laid on with a brush. The first stroke of the brush shall be from top downwards, another from bottom upwards over the first stroke and similarly one stroke from the
right and another from the left over the first brush before it dries. This will form one coat. Each coat must be allowed to dry and shall be subject to inspection and approval before the next coat is applied. When dry, the surface shall show no signs of cracking. It shall present a smooth and uniform finish free from brush marks and it should not come off easily when rubbed with a finger. Minimum three coats of white wash shall be applied.

No portions in the surface shall be left out initially to be patched up later on. For new work, the white washed surface shall present a smooth and uniform finish.

For old work, patches and repairs shall be white washed first. Thereafter, the whole surface shall be white washed with the required number of coats. Doors, windows, floors and other articles of furniture etc. shall be protected from being splashed upon. Splashings, droppings, if any shall be removed and the surface cleaned.

13.13.2 COLOUR WASH:

MATERIAL: This shall be prepared by adding approved colouring matter to the white wash (prepared as for white washing) according to tint required. In all other respects the same conditions and specifications as applicable to white wash shall also be applicable to colour wash.

13.13.3 DISTEMPERING:

POWDERED /DRY DISTEMPER:

(a) MATERIAL: The powdered/dry distemper shall be of approved colour and shade manufactured by M/s. Garware Paints or other equivalent and approved.

(b) SCAFFOLDING: This shall be double or single as required and directed.

(c) PREPARING THE SURFACE: The surface to be distempered shall be cleaned and all cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared must be completely dry and free from dust before distempering is commenced. In the case of walls newly plastered, special care shall be taken to see that it is completely dry before any treatment is attempted. For the old surface which had earlier been distempered, the surface shall be cleaned of grease, dust etc. The flakings of previous coatings, if any, shall be taken off. All cracks, holes and surface defects shall be repaired with gypsum and allowed to set hard and then sand papered smooth and wiped clean. But in case the surfaces are coloured or white washed, the wash must be removed thoroughly first.

(d) PRIMING COAT: The priming coat shall be applied over the completely dry surface in the manner recommended by the makers in the case of patent distempers. When no priming coat is specified by the manufacturer a finely powdered chalk mixed with a thin solution of glue shall be applied to prepare a good, hard background the coating the coating when dry being sand papered as clean and smooth as possible.

(e) APPLICATION OF DISTEMPER: The instructions of the makers shall be followed regarding the preparation of the surface and application of priming and finishing coats. Distemper shall not be mixed in a larger quantity than is actually required for a day’s work. Hot water should be used to prepare the mixture.
Distempers shall be applied in dry weather with a broad stiff brush in long parallel strokes. The treated surface shall be allowed to dry and harden. Second or succeeding coats shall not be applied until the preceding coat has been passed by the architects or clients engineer. Two more coats of distemper shall be given in exactly the same manner as the first one but only after the earlier cost laid has thoroughly dried.

13.13.4 OIL BOUND DISTEMPERS: The specification and conditions for this shall be the same as that applicable for dry distemper above except that oil bound distemper of approved make, shade and colour shall be used after applying priming coat of petrifying liquid or other primer as may be recommended by the manufacturers of distemper or as directed.

13.14 PLASTIC EMULSION PAINT

13.14.1 MATERIAL: The emulsion paint and primers in general shall be of approved quality, colour and shade as approved.

13.14.2 SCAFFOLDING: This shall be double or single as required and directed. If ladders are used, pieces of old gunny bags or cloth rags shall be tied on their tops and bottoms to avoid damage of scratches to the plastered surfaces and flooring etc. Proper stage scaffolding shall be erected when painting the ceiling.

13.14.3 PREPARATION OF THE SURFACE:

(a) NEW SURFACES: The surface to be painted shall be cleaned and all cracks, holes and surface defects shall be repaired with plaster of Paris for spot filling, and with filler prepared with whiting, water and a little quantity of paint for filling and levelling the wider areas.

(b) OLD SURFACES:

(I) The surfaces, which had been previously painted with emulsion paint, shall be lightly rubbed down and washed with clean water.

(II) The surface which had been painted with oil bound distemper or oil paint, shall be cleaned, washed and sand papered.

(III) The surface, finished with lime/colour wash, powder distemper shall be completely scraped off to the bare surface.

(IV) In case, after scrapping the surface any cracks, holes or other surface defects are noted, the same shall be repaired before applying priming coat, with plaster of Paris for spot filling, and with filler prepared with whiting, water and a little quantity of paint for filling and levelling the wider areas.

13.14.4 PRIMING COAT: The priming coat of the approved shade shall be applied over the completely dry surface in the manner as recommended by the paint manufacturers. The emulsion paint, the priming coat, may be thinned down with 20% water or as recommended by the paint manufacturer. Turpentine or any other solvent shall not be used for thinning the paint.

13.14.5 APPLICATION OF EMULSION PAINT: The recommendation of approved paint manufacturers, whose product is used shall be followed regarding the preparation of the surface and the application of the priming and finishing coats. The contractor shall
arrange for technical assistance and supervision from the paint manufacturer, during the execution of the painting work.

After the priming coat has been applied and is perfectly dried, all holes, scratches if any, shall be repaired as mentioned in “preparation of surface”, and then the second coat of approved shade and manufacture shall be evenly applied and allowed to dry.

The third coat shall be carefully applied to achieve smooth and even surface after the previous coat has dried up. Minimum three coats of paint shall be applied inclusive of primer coat. If a proper and even surface is not obtained to the satisfaction of the architects/clients engineer in three coats, contractor shall carry out additional coats of painting to approval, at contractors expense. Care shall be taken that dust or other foreign material do not settle or disfigure the various coats.

13.15 PAINTING, FRENCH POLISHING, WAX POLISHING

13.15.1 PAINTING:

MATERIAL: Ready mixed oil paints and primers, in general, shall be approved quality, colour and of approved manufacture. These materials shall be in sealed tins and shall be opened in the presence of the architects / clients engineer on site.

13.15.2 REPARATION OF SURFACE:

(a) IRON AND STEEL WORK: Surface to be painted shall be thoroughly cleaned, sand papered and/or rubbed with emery cloth. If necessary, to remove grease, mortar or any other foreign material. In case of rusted surface, it shall be first cleaned with wire brushes till the corroded crust is removed. The prepared surface shall be shiny and free from brush marks, patches, blisters and other irregularities. The surface thus finished shall be got approved for painting.

(b) WOOD WORK: All surface to be painted shall be thoroughly cleaned, sand papered and removed of all foreign materials. In case of surfaces having knot and nail holes, the same shall be filled with knotting and stopping materials. The knotting material shall consist of pure shellac dissolve in mentholated spirit. Stopping materials shall consist of putty. The surfaces thus tested shall be allowed to dry and then sand papered smooth.

13.15.3 APPLICATION: After preparing the surface a primer coat shall be applied. The primer coat shall be ready mixed of approved make and manufacture. After the primer coat is applied and perfectly dried, all holes, cracks etc. if still remaining, shall be filled in with putty and the surfaces sand papered smooth. Then a second coat of paint of approved shade and manufacture shall be evenly applied and allowed to dry. The third coat shall be carefully applied to achieve smooth and even surface after the previous coat has dried up. Minimum three coats of paint shall be applied to inclusive of a primer coat. If a proper and even surface is not obtained to the satisfaction of the architects / clients engineer in three coats, the contractor shall carry out additional coats of painting to approval, at contractors expense. Care shall be taken that dust or other foreign material do not settle or otherwise disfigure the various coats.
13.15.4 FRENCH POLISHING: French polish to be used shall comply with IS: 348 - 1952 in the requirements of quality and methods of test.

Before French polish is applied, the surface of woodwork, shall be prepared in the same manner as for painting. The wood to be polished should be first painted with a filler composed of one part of whiting mixed with 0.53 part of methylated spirit. After drying, it should be finely sand papered. On the woodwork thus treated, a thin coat of French polish shall be applied and allowed to dry. After drying, the surface shall be lightly rubbed with a fine sand paper prior to the second and third coats. The surface shall show an even polished surface and be approved by the architects / clients engineer.

13.15.5 WAX POLISHING: The polish shall be of approved manufacture (e.g. Mansion Brand) or shall be prepared as under:
(a) A mixture of Bee’s wax and turpentine in proportion of 2:1 by weight shall be used. The wax is melted and added to the turpentine, mixed well and allowed to cool.
(b) The surface of woodwork shall be prepared as for oil painting before waxing. The woodwork shall be smeared with the mixture and allowed to remain overnight so that the mixture may soak into the pores of the wood. In the morning the superfluous wax shall be wiped off and the surface rubbed up with a soft flannel to a fine polish.

13.16 CEMENT PAINTING

13.16.1 MATERIAL: External waterproof cement painting shall be of approved colour.

13.16.2 PREPARATION OF SURFACE: Before painting is commenced on surface, all dirt, oil, grease, efflorescence and organic material shall be completely removed. The surface shall be wetted by sprinkling of water with fine spray. The surface shall be sprayed several times with a few minutes intervals between each spraying to allow the moisture to soak into the surface.

13.16.3 APPLICATION: Cement paint solution shall be applied to the surface with hair brushes in a number of coats to get uniform finish. After the first coat of paint is hardened, it shall be cured with water atleast for 24 hours, before the application of the second coat. At least 24 hours should elapse between the two coats. Similarly, 3rd coat shall be given to get uniform colour.

13.16.4 CURING: Cement paint work shall be kept damp atleast for seven days.

13.17 CEMENT CONCRETE FLOORING IN TWO LAYERS

13.17.1 PLAIN CEMENT CONCRETE FLOORING: Unless otherwise mentioned in the item, concrete in flooring shall be 40mm thick overall and shall be laid in two layers.

The concrete in under layer, unless otherwise specified, shall be in the proportion of 1:2:4 (Cement: Fine aggregate: Coarse stone aggregate of size 12.5mm and below) by volume and the proportion of the cement concrete for the top wearing layer shall be 1:2 (cement: combined stone aggregate 4.75mm and below) by volume. Cement, however, shall not be measured in volume but by weight. One bag of cement of 50 kgs. shall be assumed to contain 35 litres of cement i.e., 1.20 Cft. The coarse aggregate
shall be from approved source, carefully selected, sufficiently tough and hard stone pieces broken in a manner that will provide particles of approx. cubical shapes affording good interlocking.

Elongated or thin flake like fragments should be avoided. The fine aggregate shall be sand from approved source and consist of properly graded particles. The coarse and fine aggregates shall be conforming to relevant IS: 383 - 1963 and shall be washed clean if necessary.

Unless otherwise mentioned in the item, the cement concrete in under layer shall be 25mm thick and the top wearing layer shall be 15mm thick.

The concrete shall be as stiff as possible and the amount of water added shall be minimum necessary to give just sufficient plasticity for laying and compacting. For improving the workability of the mix, thorough mixing for a longer period rather than addition of more water shall be resorted to. Generally a water cement ratio of 0.5 (by weight) should suffice. Mix shall be used within half an hour of the addition of water for its preparation.

13.17.2 PREPARATION OF SUB - GRADE: Before placing the concrete flooring the sub-grade shall be got approved from the architects/clients engineer. The top surface of the sub grade, shall be thoroughly cleaned of the dirt, loose particles, cake mortar droppings and laitance if any, by scrubbing with coir or steel wire brush or by hacking if necessary. The top surface of sub grade shall be slightly rough and shall have the required slope. The sub grade shall be moistened before laying the concrete flooring without forming any pools of water.

Before commencement of laying under layer of concrete on the prepared sub grade screeds i.e., narrow strips of wood, bands of plaster or pieces of tiles laid on the sub grade to act as guides for bringing the whole work to a true and even surface and imparting necessary slope to the under layer with average thickness of 25mm or as specified in the item shall be provided. The screeds shall be removed after laying the concrete for under layer of all the floor area for which they have been applied as guides and filled up with concrete mix of under layer. No extra payment shall be made for these screeds.

13.17.3 LAYING: The concrete flooring shall be laid in alternate bays not exceeding 2 x 2 M each. The edge of each panel into which the floor is divided should be supported by flat iron or wood duly oiled to prevent sticking. Their depth shall be same as that proposed for the concrete flooring as mentioned in the item. At least 48 hours shall elapse before the concreting in the adjoining bays is commenced. AC/glass/aluminium strips or other approved separators (depth to be same as that proposed for concrete flooring) shall be provided if specified in the item and shall be retained permanently in the concrete flooring. Care shall be taken to see that at no point the separators shall protrude above the finished floor level.

Just before placing the concrete mix for under layer, neat cement slurry shall be thoroughly brushed into the prepared sub grade.
The concrete for under layer shall be laid immediately after mixing. While being placed, the concrete shall be vigorously sliced and spaded with suitable tools to prevent formation of voids or honey comb pockets. The concrete shall be brought to the specified levels by means of a heavy straight edge resting on the side forms and drawn ahead with a sawing motion in combination with series of lifts and drops alternating with small lateral shifts. While concreting the adjacent bays, care shall be taken to ensure that the edges of previously laid bays are not broken by careless or hard tamping. Immediately after laying the concrete, the surface shall be inspected for high or low spots and any needed correction shall be done by adding or removing the concrete. After striking of the surface to the required grade. It shall be compacted with wooden float. The blows shall be fairly heavy in the beginning but as consolidation takes places, light rapid strokes shall be given to complete the ramming.

The surface of the concrete in under layer as laid above, shall not be finished smooth with a trowel but left rough after tamping it and levelling it with screed board.

The top wearing layer of mix 1:2 cement concrete of consistency stiffer than that of under layer concrete shall then be immediately laid over the rough but green surface of under layer and thoroughly tamped, stuck off level, and the surface floated with wooden float. The surface shall then be tested with a straight edge and mason’s spirit level to detect any undulation in the surface which, if any, shall be made good immediately. The surface shall then be finished smooth as stated below.

13.17.4 FINISHING THE SURFACE: After the concrete has been fully compacted it shall be finished by trowelling. Finishing operations shall start shortly after the compaction of concrete and shall be spread over the period of one to six hours depending upon the temperature and atmospheric conditions. The surface shall be trowelled at intervals so as to produce a uniform and hard surface. The satisfactory resistance of floor to wear depends largely upon the care with which trowelling is carried out. The object of trowelling is to produce as hard and close knit a surface as possible. The time interval allowed between successive trowellings is very important. Immediately after laying top wearing layer, only just sufficient trowelling in the earlier stages shall be avoided as this tends to work a lay rich in cement to the surface. Sometime after the first trowelling the duration depending upon the temperature, atmospheric conditions and the rate of set of cement used, the surface shall be retrowelled to close any pores in the surface and to bring to surface and scrap off any excess water in concrete or laitance (it shall not trowelled back into the topping). 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. The finished surface shall be smooth and even. Trowelling of a rich mix of dry cement and fine aggregate on to the surface shall not be permitted. The junctions of floor and walls shall be rounded off if so directed without extra payment.

Trowel marks, wherever visible shall be immediately removed by lightly brushing with 100mm wide painter’s brush which is made just moist, so as to have the surface of uniform appearance. Over - brushing shall be avoided.
After the concrete in the bays has set, the joints (if permanent separators are not provided) of the panel shall be filled with cement paste as directed. The joints shall be straight both ways i.e., along the length and width. The vertical edge of the bays shall be neatly marked on the surface with a pointed trowel after filling the joints. No extra mortar shall be laid over the concrete to make the floor in level.

If broom finish is specifically mentioned in the item, the surface shall be obtained rough with parallel broom makes before the concrete sets.

13.17.5 If coloured cement concrete flooring is specified in the item, the top wearing layer shall consist of concrete mix coloured with the addition of coloured cement and approved mineral pigment of required colour thoroughly mixed with cement when dry. Quantity of approved mineral pigment shall be such as to produce required shade but in no case will it exceed one third part of cement.

A few samples of coloured concrete flooring of required coloured and shade (Light Shade, Medium or Dark Shade as specified in the item) shall be got approved from the architects / clients engineer before commencement of flooring work.

13.17.6 CURING: Immediately after the flooring surface is finished, it shall be protected from rapid drying by erected barriers against wind or draught and strong sun light. As soon as the surface has hardened sufficiently to prevent damage to it, it shall be kept continuously moist for atleast ten days by means of wet gunny bags, 50mm thick layer of damp sand spread over the surface or pooling water on the surface. During this period the flooring shall not be exposed to any traffic.

13.17.7 HAND GRINDING AND POLISHING: Whenever specified in the item grinding shall be carried out as under to make the surface smoother than trowel finish.

(a) FIRST GRINDING WITH CARBORUNDUM STONE OF COARSE GRADE: Grinding shall be commenced when the concrete surface is 3 - 4 days old and sufficiently hardened and cured. The first grinding should be done with carborundum stone of coarse grade and fine sand sprinkled over the surface using water freely.

After the first grinding, the surface shall be thoroughly washed to remove all grinding mud and covered with a grout of cement (including colouring pigment in case of coloured concrete flooring) in order to fill the pores and pin holes that appear after grinding.

(b) SECOND GRINDING WITH CARBORUNDUM STONE OR MEDIUM GRADE: After the first grinding is over the surface shall be cured for 4 days and then the second grinding should be started with carborundum stone of medium grade. The flooring shall be washed and pores or holes if any shall be filled in the same manner as described in (a) above.

(c) FINAL GRINDING WITH CARBORUNDUM STONE OF FINE GRADE: After ten days from the completion of the second grinding, the final grinding shall be carried out with carborundum stone of fine grade.

(d) CLEANING AND POLISHING: After the completion of the grinding as above the floor shall be thoroughly washed with warm water and soft soap and when it is completely dry, oxalic acid powder shall be dusted over the surface sufficiently, which must be sprinkled with water and rubbed hard with a piece of felt till the surface has acquired required gloss.
A hot mixture of turpentine and Bees Wax (4:1 by weight) shall then be applied to the surface and thoroughly rubbed with clean cotton waste. The rubbing must be continued until the flooring ceases to be sticky.

13.18 **ALUMINIUM DOORS, WINDOWS AND VENTILATORS**

13.18.1 All aluminium work shall be free from defects impairing strength, appearance and shall be of the best available quality for the purpose specified. The aluminium alloy used in the manufacture of extruded door / windows / ventilators sections shall correspond to IS designations HE 9 - WP of IS: 733 - 1956. “Specifications for wrought aluminium and aluminium alloys bars, rods and section (for general engineering purposes). Hollow aluminium alloy section and coupling section used shall wrought aluminium and aluminium alloys extruded round tube and hollow section (for general engineering purpose only).

Contractors shall commence manufacturing of doors / windows / ventilators only after the shop drawings showing full size, sections, thickness of mortar details of construction, hardware etc. submitted by them are approved.

All the manufactured doors, windows and ventilators shall be stacked on site under cover. Damaged surfaces with defects like scratches etc. on finished work shall not be accepted. Fabricated materials shall be created in an approved manner to protect the material against any damage during transportation. Loading and unloading shall be carried out with utmost care. The doors, windows and ventilators on arrival at site shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of damaged pieces / parts. Materials found to be acceptable on inspection only shall be used.

All exposed surfaces of sections for aluminium doors / windows / ventilators including beading and other accessories shall be anodized after fabrication, in a manner conforming to IS: 1868 - 1968 and to approved finish. Anodic coating shall be of a minimum thickness of 15 microns.

Anodizing shall be in matt finish approved colour.

13.18.2 **ALUMINIUM DOORS, WINDOWS AND VENTILATORS:** Aluminium doors, windows and ventilators shall be manufactured from sturdy extruded sections of approved manufacture and shall be of aluminium alloys as stated above.

Contractor shall provide sturdy sections/members of the doors, windows and ventilators including combination of joints so as to withstand wind load of high intensity.

The frame shall be square and flat and corners of the frames being fabricated to true right angles. Both the fixed and opening frame shall be of sections which have been cut to length, mitred and mechanically jointed and / or electrically welded at corners as required for satisfactory performance.
Sub-dividing bars shall be tenoned and riveted into the frames. All members shall be accurately machine milled and fitted to form hairline joints. The jointing accessories such as cleats, brackets, etc., shall be of such material as not to cause any bi-metallic action.

All the sizes indicated in the tender as well as in the drawings for various windows, ventilators, doors, etc. are to be considered as structural openings at work site. These opening sizes are to be physically measured and verified at the site by the contractor before taking up the actual manufacture of various units.

13.18.3 METHOD OF FIXING:

(a) ALUMINIUM DOORS, WINDOWS AND VENTILATORS IN BRICK WORK AND CONCRETE WORK: Aluminium doors, windows and ventilators shall be fixed to brick work by means of slotted steel adjustable lugs (natural finish), not less than 100mm x 16mm x 3mm with counter sunk galvanised machine screws and nuts 19 x 6.3mm and to concrete works by means of 45mm x No. 10 galvanised wood screws.

(b) FIXING SCREWS AND LUGS: Outer frame shall be provided with fixing holes centrally in the web of the section at approved intervals. Any steel lugs coming in contact with aluminium should be either galvanised or give one coat of bituminous paint.

After fixing the frame in position as stated above the space between the concrete surface and the frame of doors / windows / ventilators shall be pressure grouted with CM 1:4 so as to achieve absolute water tightness between the frame and the inside surface.

Further all the vertical and horizontal members of doors, windows, ventilators, etc. shall be provided with Neoprene weather stripping. The contractor shall design fabricate and fix in position the doors, windows in such a way that the water penetration is totally and effectively sealed and any dampness on the inner surfaces is completely eliminated. Further, to drain out any water falling on the members of the frame, a continuous drip - strip and necessary weep holes shall be provided. The shop drawing submitted by the contractor shall show the method of sealing water penetration also.

The method of fixing the doors, windows and ventilators in position stated above shall generally be adopted by the contractors and the members used in the manufacturing of units shall be so designed to suit the above method of fixing. However, the contractors are free to adopt any other equivalent method of fixing aluminium doors, windows and ventilators if the same is approved the architects/clients engineer. In no case doors/ windows / ventilators shall be allowed to be fixed over wooden runners.

The doors, windows and ventilators should be designed not only for its strength, stability, stiffness against all odds, but for easy operation, water tightness, easy
replacement of glass and cleaning from inside. All screws used shall be of adequate size and shall be cadmium plated brass.

13.18.4 GLASS AND GLAZING: Glass shall be of the type and quality specified in the Schedule of Quantities and as per approved make. Before installation of the glass, contractor shall ensure the following:
(a) All glazing rebates shall be square, plumb, true in place, clear, dry and free of dust.
(b) Glass edges shall be clear and cut to exact size, glass with chipped or damaged edges shall be rejected.
(c) Glass shall be set in glazing clips and so installed to achieve proper water tightness.
(d) Suitable PVC or Neoprene gaskets shall be used for fixing glass so as to prevent rattling.
(e) BEADING: Beading shall be of anodized aluminium section and shall be snap-on type having mitred corners either triangular or rectangular as per contractor’s design and shall not be less than 0.13 Kg. per RM.
(f) Any hollow portion between the frame and the brick / concrete surfaces and the component parts of the frame shall be filled up with suitable mastic / cement and sand fillet as per IS
(g) If required by the architects / clients engineer, putty shall be applied to the face of the bead which is in contact with glass. Putty would also be filled, if necessary at the back. Putty used for glazing shall conform to IS 420 - 1953.

On completion of job, all glass shall be thoroughly cleaned and free from dirt, putty or other adhering material.

(h) Wastage in cutting of glass, shall be to contractor’s account. Frosted / ground glass shall be set with smooth surface outside.

13.18.5 Contractors shall submit the detailed drawing showing the various members of aluminium doors, windows and ventilators which they propose to use alongwith their filled in tender.

13.18.6 Contractors shall necessarily submit a statement giving all details about the size and the thickness of each section, the weight of each aluminium section per RM. and actual weight of complete unit excluding weight of glass, hardware, hinges, clips, screw but including beadings as proposed by the contractor at the time of submitting the tender.

The permissible variation to the actual weight of complete individual unit (exclusive of glass, hardware and fittings) of doors / windows / ventilators which they propose to provide, shall be within the limit of + or - 5% of the minimum weight of each unit.

The members proposed to be provided by the contractors for aluminium doors, windows and ventilators shall be of approved quality and sturdy to withstand the wind pressure of high intensity and day to day handing and shall be free from rattling, leakage etc. If required, contractor shall furnish the detailed design calculation to substantiate the sturdiness of each door, window and ventilator. In case, any modifications in sizes, thickness and weight are required to any members of doors, windows and ventilators, same shall be carried out by the contractor and suitable adjustment shall be made on the basis of relevant tender items.
13.18.7 Aluminium doors, windows and ventilators shall be as manufactured by approved make including fittings and fixtures as shown on drawings.

13.18.8 The architects / clients engineer reserves the right to delete any or all items of this trade and allot the work under this head to any specialised agency/agencies. No claim whatsoever shall be entertained on this account.

13.18.9 **HARDWARE:** Hardware shall be of best quality extruded section and shall be of anodized aluminium with natural finish. Hinges shall be of heavy pattern with stainless steel pins and stainless steel washers. The bolts and screws etc. shall be of cadmium plates brass of required size to secure and permanently fix the hardware in place.

No steel or iron screws shall be used. Samples of different items of hardware including screws shall be submitted alongwith the sample of doors / windows / ventilators for approval. Contractor shall be responsible for the proper working of all hardwares for a period of one year from the date of completion.

13.18.10 **OVERALL SIZES OF ALUMINIUM DOORS, WINDOWS AND VENTILATORS:** Size of doors, windows and ventilators in the tender shall be considered as approximate.

These sizes are likely to reduce by about 40mm to 50mm due to TW surrounds to be provided in the opening. Contractor shall therefore, verify all sizes at site before manufacturing. Payment shall be based on the actual size provided.

13.18.11 **SIZES OF ALUMINIUM SECTIONS AND WEIGHTS OF EACH UNIT:** Contractors shall note that sizes and minimum weights of each unit of doors, windows and ventilators given shall be considered as overall guidelines for arriving at the proposed actual unit weight of each door/window/ventilator and also to help contractors for choosing the various sections for the different members of each unit of doors, windows and ventilators. Contractors shall however, submit details of sizes and weights of all sections for each type of door, window and ventilator etc. as also actual weight per unit.

13.18.12 **SIDE HUNG AND TOP HUNG WINDOWS / VENTILATORS:** The aluminium hinges for side hung and top hung windows / ventilators shall be fabricated out of extruded sections confirming to IS designations HE 10 WP or HE 30 WP of IS : 733 - 1956. Specifications for wrought aluminium and aluminium alloys, bars, rods and sections (for general engineering purposes).

13.18.13 **CENTRE - HUNG VENTILATORS:** Centre - hung ventilators shall be hung on two pairs of cup pivots of aluminium alloy to IS Designation NS - 4 of IS: 737 - 1955 specification for wrought aluminium and aluminium alloys, sheet and strip (for general engineering purposes) and riveted to the inner and outer frames of the ventilator to permit the ventilator to swing through an angle of approximately 85 degree. The opening portion of the ventilator shall be so balanced that it remains open at any desired angle under normal weather condition.

13.18.14 Contractors shall satisfy in regard to water tightness of their design of the aluminium doors, windows and ventilators and also the water tightness between the ventilator/ window/door frames, sub frame and similarly between sub frames and brick / concrete members to which the same is fixed. Each rectification of any leakage noticed in the
aluminium doors/windows/ventilators or doors/windows/ventilators frame and aluminium sub-frame or aluminium sub-frame and brick/concrete masonry work shall be the responsibility of the contractor supplying and fixing aluminium doors, windows and ventilators and the contractor will have to rectify the defects at their own cost.

13.18.15 **APPROVED OF ALUMINIUM SECTIONS:** Aluminium sections shall be as per approved make of materials.

13.18.16 **INFORMATIONS:** The contractor shall provide all the information as to where the fabrication and anodizing will be carried out by him.
14. WATER SUPPLY, INTERNAL SANITARY INSTALLATIONS AND DRAINAGE WORK

14.1 GENERAL

14.1.1 All water supply, internal sanitary installations and drainage works shall be carried out by skilled and licensed plumbers in a manner complying in all respects with the requirements of the relevant by-laws of the Municipal or of the local bodies in whose jurisdiction the work is to be executed.

14.1.2 All fittings are to be accurately placed in the positions as directed by Architects / clients engineer, to be securely plugged to walls with hard wood or any other approved plugs or breeze blocks built into Brick/Stone RCC work, or set in cement as required and are to be left in a clean, sound and perfect condition.

14.1.3 All sizes and lengths to be verified at site.

14.1.4 The whole of the work is to be tested at Contractor’s expense at such times and in such manner as architects/clients engineer shall direct and to the latter’s satisfaction. The contractor shall also make arrangements for the disinfection of all mains and tanks intended for potable water to the satisfaction of the architects / clients engineer. The mains and tanks should be thoroughly flushed with clean water after disinfection.

14.1.5 All drainage done to floors, walls etc., during the process of fixing of water supply, internal sanitary installations and drainage work shall be restored to original condition to the satisfaction of the architects/clients engineer at the contractor’s expense.

14.1.6 All the materials shall be in accordance with the specifications and shall be approved by the architects/clients engineer before bulk supplies are brought to site. The contractor shall furnish well in time before work commences, at his own cost, any samples of materials or workmanship that may be called for by the architects / clients engineer for his approval or rejection and any further samples in case of rejection until such samples are approved. Such samples when approved shall be the minimum standard of the work to which they apply. Where materials are specified to comply with an Indian Standard Specification, the Contractor shall, if required, furnish the manufacturer’s Certificate that the materials satisfy the requirements of Indian Standard Specifications. For plumbing works, typical sample prototypes shall be erected in position for approval before undertaking work. Materials rejected shall be removed forthwith by the Contractor off the premises.

14.1.7 Sewers and drains shall be laid in proper alignment and gradient in accordance with the rules and regulations of statutory bodies whose approval are necessary on completion.

A. WATER SUPPLY

14.2 CAST IRON PRESSURE PIPES AND SPECIALS

14.2.1 Pipes and Specials: All pipes and specials shall be of cast iron or spun iron, straight with spigot and socket ends or with flanged ends as specified and shall conform to the latest edition of the ISI for class “LA” pipes. Class A pipes may be used when the test water pressure exceeds 120 metre of head. The pipes and specials shall be suitable for jointing
with lead unless otherwise specified. As far as possible only standard specials shall be used.

14.2.1 All pipes shall be coated inside and outside while hot with an approved anti - corrosive paint having a tar or other suitable base.

14.2.2 Excavation of trenches for CI pipes and Specials :

14.2.2.1 Excavation: The trenches for the pipes shall be excavated to lines and levels as directed. The bed of the trenches shall have to be truly and evenly dressed throughout from one change of grade to the next.

14.2.2.1.1 The gradient is to be set out by means of boning rods and should the required depth be exceeded at any point, the trench shall be refilled as directed by the architects / clients engineer at the contractor’s expense.

14.2.2.1.2 The bed of the trench, if in soft or made up earth, shall be well-watered and rammed before laying the pipes and depressions thus formed shall be filled with sand or other soft materials as the architects / clients engineer may direct.

14.2.2.1.3 If rock is met with, it shall be removed to 15cm below the level of the pipe valves and fittings and the trench shall be refilled with sand or other suitable materials.

14.2.2.1.4 The excavated materials shall not be placed with one metre or half the depth of the trench, whichever is greater from the edge of the trench.

14.2.2.1.5 The trench shall be kept free from water. Shoring and timbering shall be provided wherever required.

14.2.2.1.6 The width of trench at bottom between faces of sheeting shall be such as to provide not less than 20cms clearance on either side of pipe. Trenches shall be of such extra width when required as will permit the convenient placing of timber supports, strutting and planning and handling of specials.

14.2.2.2 Internal Road Crossing: All road crossing within the site if any, will be excavated half at a time the second half being commenced, after the pipes have been laid in the first and the trench refilled. The trench at existing road crossings shall be filled with mud concrete for the full depth except for the top 15cm layer, which will be filled with cement concrete 1:2:4.

14.2.2.3 Protection of Existing Services: All pipes, water mains, cables etc., met within the course of excavation shall be carefully protected and supported by the contractors at their own cost to the satisfaction of the architects / clients engineer. Such mains will be hung from timbers placed across the trench. Care shall be taken not to disturb the electrical and communication cables, removal of which, if necessary shall be arranged by the architects / clients engineer.

14.2.2.4 Lighting and Watch: The open trenches shall be provided with fencing and watchmen to guard against accidents. Red flags during day and red lights during night shall be provided at the ends and at intervals along the sides of the trenches.

14.2.2.4.1 Sign boards with necessary wording such as “SLOW” “ROAD CLOSED” etc. shall be provided at least 30 metres ahead of road crossings where the work is in progress. The precautions will be continued till the surface is restored. The contractor shall be held responsible for compensation as a result of accident or
injury to any person or property due to improper fencing or inadequate lighting arrangements.

14.2.2.4.2 Temporary bridges of planks shall be provided over the trenches for keeping open the access to private or public property.

14.2.3 Lay of pipes and specials:

14.2.3.1 Stacking: The pipes and specials shall be lined up on one side of alignment of the trench, socket facing uphill or in the direction of flow of water.

14.2.3.2 Laying: Before being laid the pipes shall be examined to see that there are no cracks or defects. Subject to the approval of the architects / clients engineer, the damaged portion of the cracked pipe may be cut at a point not less than 15cm beyond the visible extremity of the crack with diamond pointed chisel. Before lowering the pipe in the trench, the pipes shall be thoroughly cleaned of all dust and dirt. Special care shall be taken to clean the inside of the sockets and the outside of the spigots. Holes to receive the sockets shall be excavated in the trench bed so as to firmly bed the full length of the pipe.

14.2.3.2.1 The pipes shall be lowered into the trench by means of suitable pulley blocks, shearings, chains, ropes etc. In no case the pipes shall be rolled and dropped into the trench. After lowering the pipes, the spigot of one pipe shall be carefully centred into the socket of the next pipe and driven to the full distance that it can go and the pipe line laid to levels required, being kept in position by earth filling well watered and rammed at two or more places in its length.

14.2.3.2.2 Specials shall also be laid in their proper position as stated above.

14.2.3.2.3 The pipes laid on level ground, will be laid with socket facing the direction of flow of water. In all other cases, the sockets will be laid facing uphill.

14.2.3.2.4 Any deviation either in plan or elevation of less than 11-1/4 degree shall usually be effected by laying the straight pipes round a flat curve, of such radius that minimum thickness of lead at the face of the socket shall not be reduced below 12mm or the opening between spigot and socket increased beyond 12mm at any joint. A deviation of about 2-1/2 degree can be effected at each joint in this way.

14.2.3.2.5 At the end of each day’s work, the last pipe to be laid shall have its open end securely closed with a wooden plug, to prevent access to dirt and animals.

14.2.4 Thrust Blocks and Anchorages: Portland cement concrete thrust blocks of suitable design shall be provided at all bends of the pipes so as to withstand dynamic and static forces likely to be developed due to water running through the pipes. The thrust blocks shall be made after the joints have been caulked with lead and these shall be paid for separately, unless otherwise specified.

14.2.5 Lead caulked joints:

14.2.5.1 Lead for joints: It shall be bluish grey in colour very soft and malleable of uniform quality readily melted, free from foreign material and shall conform to IS 782.

14.2.5.2 Spun yarn for joints: This shall be of best quality preferably white. It shall be free from oil, tar or greasy substances and shall be soaked in hot coal tar or bitumen and dried before use.
14.2.5.3 **Jointing:** The yarning material shall be placed around the spigot of the pipe and shall be of proper dimensions to centre the spigot in the socket. When spigot is shaved home, the yarning material shall be driven tightly against the inside base or hub of the socket with suitable yarning tools. When a single strand of yarning material is used, it shall have an overlap at the top of not more than 5 cm. When more than a single strand is required for a joint, each strand shall be cut to sufficient length so that the ends will meet without causing overlap. The ends of the strands shall meet on opposite sides of the pipe and not on the top or at the bottom. Successive strands of yarning material shall be driven home separately. The leading of the pipes etc. shall be done by means of ropes covered with clay or by using special leading rings. The lead shall be rendered thoroughly fluid and each joint shall be filled in one pouring.

14.2.5.4 **Quantity of lead and yarn:** Approximate weight of lead and yarn required for joint for various sizes of CI pipes and specials shall be as per IS 3114 as under:

<table>
<thead>
<tr>
<th>Dia of pipe</th>
<th>Lead / Joint</th>
<th>Spun Yarn / Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>80mm</td>
<td>1.8 kg</td>
<td>0.10 kg</td>
</tr>
<tr>
<td>100mm</td>
<td>2.2 kg</td>
<td>0.18 kg</td>
</tr>
<tr>
<td>125mm</td>
<td>2.6 kg</td>
<td>0.20 kg</td>
</tr>
<tr>
<td>150mm</td>
<td>3.4 kg</td>
<td>0.20 kg</td>
</tr>
<tr>
<td>200mm</td>
<td>5.0 kg</td>
<td>6.30 kg</td>
</tr>
<tr>
<td>250mm</td>
<td>6.1 kg</td>
<td>0.35 kg</td>
</tr>
<tr>
<td>300mm</td>
<td>7.2 kg</td>
<td>0.48 kg</td>
</tr>
<tr>
<td>350mm</td>
<td>8.4 kg</td>
<td>0.60 kg</td>
</tr>
<tr>
<td>400mm</td>
<td>9.5 kg</td>
<td>0.75 g</td>
</tr>
</tbody>
</table>

**Note:** The quantities of lead and spun yarn given in this table are provisional and a variation of 20% is permissible.

14.2.5.5 **Caulking:** After the joints have been run they must be thoroughly caulked until they are perfectly water-tight. Caulking of joints will be done after a convenient length of pipe has been laid and leaded. The leading ring shall first be removed and any lead, outside the socket shall be removed with a flat chisel and then the joint caulked round three times with caulking tools of increasing thickness and a hammer of 2 to 3 kgs. weight. Lead joints shall not be covered till the pipe line has been tested under pressure but the rest of the pipe line may be covered up to prevent expansion and contraction due to variation in temperature.

14.2.5.6 **Lead Wool Joint:** When it is impractical or dangerous to use molten lead for joints they may be made with lead wool inserted in strings not less than 6mm thick and thoroughly caulked.

14.2.6 **Flanged Joints:** CI pipes may also be joined by means of flanges cast on where specified. The jointing material between flanges of pipes shall be compressed fibre board or rubber of thickness between 1.5mm to 3mm. The fibre board shall be impregnated with chemically neutral mineral oil and shall have a smooth and hard surface. Its weight per sq. metre shall be not less than 112gm/mm thickness.
14.2.6.1 Each bolt shall be tightened a little at a time taking care to tighten diametrically opposite bolts alternatively. The practice of fully tightening the bolts one after another is highly undesirable.

14.2.7 Testing: Before testing, the trench shall be partially back-filled except at the joints. Completed pipe line shall be subjected to the following two tests:

(a) Pressure test at a pressure of at least double the maximum working pressure, pipe and joints shall be absolutely watertight under the test.
(b) Leakage test (to be conducted after the satisfactory completion of the pressure test) for a duration of two hours.

14.2.7.1 Where any section of a main is provided with concrete thrust blocks or anchorage, the pressure test shall not be made until at least five days have elapsed after the concrete was cast.

14.2.7.2 Pressure Test Procedure: Each valved section of the pipe shall be slowly filled with water and all air shall be expelled from the pipe through hydrants and blow-offs. If these are not available at high places, necessary tapping may be made at points of highest elevation before the test is made and plugs inserted after the tests have been completed.

14.2.7.2.1 The specified pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the architects/clients engineer. The duration of the test shall not be less than 5 minutes.

14.2.7.2.2 All exposed fittings, valves, hydrants and joints should be carefully examined during the test. When the joints are made with lead, all such joints showing visible leaks shall be recaulked until tight. Any cracked or defective pipes, fittings, valves or hydrants discovered in consequence of this pressure test shall be removed and replaced by sound material and the test shall be repeated at contractor’s own expense until satisfactory results are obtained.

14.2.7.3 Leakage Test Procedure: Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

14.2.7.3.1 Should any test of pipe laid disclose leakage greater than that permitted by IS code of Practice 3114, defective joints shall be repaired at contractor’s own expense until the leakage is within the specified allowance.

14.2.8 Refilling: Refilling in trenches for pipes shall be commenced as soon as the joints have been tested and passed. The refilling on top and round the pipes, shall be done with great care and in such a manner so as to obtain the greatest amount of compactness and solidity possible. For this purpose the earth filling shall be done in regular layers of 15cm (watered and rammed at each layer). All surplus earth shall be disposed off as directed by the architects / clients engineer.

14.3 G.I. PIPES AND FITTINGS:

14.3.1 Pipes and Fittings: The pipes shall be of the class specified in the schedule of quantities and shall be of galvanised steel, welded and seamless, screwed and socketed.
and shall conform to the latest ISI specifications for such pipes. They shall be manufactured by a firm of repute. All fittings shall of malleable iron galvanised fittings of approved make.

14.3.1.1 The details of screwed and socketed GI pipes regarding nominal bore thickness and weight shall be as per IS 1239 (Packet - A ) as under:

<table>
<thead>
<tr>
<th>Nominal bores</th>
<th>Weight of pipe in kg/M.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Light</td>
</tr>
<tr>
<td>15mm</td>
<td>0.96</td>
</tr>
<tr>
<td>20mm</td>
<td>1.42</td>
</tr>
<tr>
<td>25mm</td>
<td>2.03</td>
</tr>
<tr>
<td>32mm</td>
<td>2.61</td>
</tr>
<tr>
<td>40mm</td>
<td>3.29</td>
</tr>
<tr>
<td>50mm</td>
<td>4.18</td>
</tr>
<tr>
<td>65mm</td>
<td>5.92</td>
</tr>
<tr>
<td>80mm</td>
<td>6.98</td>
</tr>
<tr>
<td>100mm</td>
<td>10.20</td>
</tr>
</tbody>
</table>

Note: The above weights are for black pipes and theoretical weights of galvanised pipes are about 6% higher

14.3.1.2 The pipes shall be tested to withstand a pressure of 50kg/Sq.cm without showing defects of any kind. These shall be supplied screwed with taper threads and the sockets with parallel threads.

14.3.2 Laying in trenches for External work: GI pipes and fittings shall be laid in trenches. The width of the trench shall be the minimum width required for the working. The pipes laid underground shall not be less than 60cm from the ground level. They shall be surrounded on all sides by approved quality material.

The work of excavation and refilling shall be done as specified earlier for Cast Iron Pressure Pipes. All pipes and fittings laid below ground shall be painted with anti-corrosive bitumastic paint and wrapped with hessian and again coated with anti-corrosive bitumastic paint of approved quality.

14.3.2.1 Pipes embedded in masonry / concrete shall be treated similarly as described above.

14.3.3 Fixing of pipes for internal work: GI pipes and fittings on the walls shall be fixed by means of standard pattern holder-bat clamps, keeping the pipe 12mm clear of the plastered surface of wall everywhere, or concealed (inside chase) as directed. Where pipes are to be concealed in walls and floors by cutting chases, the pipes and fittings shall be coated with bitumen, wrapped with hessian and again painted with one coat of anti-corrosive bitumen of approved quality. Cutting long lengths of horizontal chases on the walls for concealing pipes shall be avoided.
14.3.1 All exposed GI pipes and fittings shall be painted with two coats of oil paint of approved quality, manufacture, colour and shade, over a coat of red oxide or other approved primer after cleaning thoroughly the surface of the pipes and fittings and allowed to dry.

14.3.2 All pipes and fittings shall be fixed truly vertical and horizontal or as directed by the architects/clients engineer. Care shall be taken to ensure that concealed GI pipes (used for external or internal work) are not laid in mortar or concrete surroundings.

14.3.4 Jointing: Where pipes have to be cut or re-threaded, ends shall carefully filed out so that no obstruction to bore is offered.

14.3.4.1 In jointing the pipes, the inside of the socket and the screwed end of the pipe shall be rubbed over with white lead and few turns of hemp yarn wrapped round the screwed end of the pipe which shall then be screwed home in the socket with a pipe wrench. Care must be taken that all pipes and fittings are kept at all times free from dust and dirt during fixing.

14.3.5 All GI pipes and fittings may be tested to a pressure of 7 kg per sq.cm. to ensure that pipes have proper threads and that proper materials (such as white lead and hemp) have been used in jointing. All leaky joints must be made leakproof by tightening or redoing at contractor's expense.

14.4 WATER METERS, SLUICE VALVES AND OTHER APPURtenances

14.4.1 Water Meters (Domestic type): Water meters upto 50mm nominal size shall conform to IS specifications for water meters (Domestic type) IS: 779 of Type A unless otherwise specified. The meter body shall be of bronze gun metal or brass and marked to read in litres complete with registration box, cap and lid. The water metres shall be provided with strainers. Strainers shall be of a material which is not susceptible to electrolytic corrosion.

They shall be rigid, easy to remove and clean and shall be fitted on the inlet side of water meter. It shall be possible to remove and clean the strainer in such a way as not to permit disturbing the registration box or tampering with it. Meters provided with internal strainer involving opening of the registration box for cleaning, shall be fitted with an additional strainer on the inlet side.

14.4.1.1 Connections: The meter casing shall be fitted in the pipe line by two conical or cylindrical nipples or tail pipes with connecting nuts which shall be provided with each meter. The nipples of water meter shall be made of the same materials as specified for body.

14.4.1.2 Markings: Each meter shall be marked with the following information:
   (a) Nominal size
   (b) Direction of flow
   (c) ISI certification mark
   (d) Manufacturers name and trade mark.

14.4.2 Water Meters (Bulk type): These shall conform to IS: 2373 and shall be of size 50mm and above. They shall be of (impeller) vane wheel type or helical type. The body of the meter shall be made from cast iron. The meter casing shall be fitted into the pipe line by means of a double flange, the internal diameter of which shall be equal to nominal size
of meter. The meter shall be provided with registration box and cap of brass or cast iron. Provision shall be made to lock the lid to registration box. Meters shall be supplied and fitted with an External Strainer (Dirt box) of suitable material not susceptible to electrolytic. Meters shall be provided with markings as described in Clause 4.1.2 above.

14.4.3 Ferrules: Brass ferrules shall conform to IS: 2692. Necessary saddle pieces of approved type shall be used for off take of the service connections.

14.4.4 Sluice valves: Sluice valves shall conform to IS: 780 and shall be of class I type unless otherwise specified with double flange and handwheel for operation. The body, dome, cover, stuffing box, thrust plate, wedge, gland and cap may be of cast iron but the spindle shall be of brass or aluminium bronze. Valves shall be fixed to spigot and socket cast iron and steel pipes by means of suitable flanged spigots or flanged socketted tail piece as directed. Before the valves are actually fixed, they shall be cleaned and greased and it should be seen that all parts are in perfect working condition.

14.4.4.1 Surface boxes for sluice valves: These shall conform to IS: 3950 with a cast iron frame and a mild steel hinge pin. The upper surface of cover shall have non-slip surface. The surface boxes shall be coated with a composition having bitumen or tar base. The minimum weight of surface box shall be 33kg. The internal size of surface box shall be 230mm x 150mm x 150mm.

14.4.5 Air Valves: These are placed at every summit in the pipe line to permit the escape of air when the main is filled and afterwards if any air is carried into the main. Fixing of Air Valves may be done by means of fixing saddle pieces on pipes and drilling the same where necessary.

14.4.6 Brick Masonry Chambers for Housing Meters, Valves and Appurtenances: These shall be constructed as per size as indicated. These shall be measured and paid for separately. The bricks used shall be of first quality best locally available and from approved source and shall be laid in CM 1:3. The walls shall be plastered both inside and outside with 15mm thick cement plaster 1:3. The foundation concrete shall be of PCC 1:4:8 and 75mm thick. The top slab shall be of 100mm thick RCC 1:2:4 unless otherwise specified.

B. INTERNAL SANITARY APPLIANCES

14.5 SQUATTING PATTERN W.C. PAN:

14.5.1 W.C. Pan: The W.C. pan shall be of white vitreous china of specified size and pattern (“Orissa” or “Long Pattern” as specified) with an integral flushing rim. It shall have the flushing horn in the front unless it is not possible to accommodate cistern to suit this design. The pan shall have approved quality conforming to IS specifications IS: 2556 (Part III). It shall have 100mm CI or porcelain trap, ‘P’ or ‘S’ type, with effective seal 50mm and 50mm vent arm.

14.5.1.1 Fixing: The WC pan shall be sunk in floor sloped towards the pan in a workmanlike manner, care being taken not to damage the pan in the process of fixing. If damaged in any way, it shall be replaced at contractor’s cost. It shall be fixing on a proper cement concrete base 1:3:6 proportion taking care that the cushion is uniform and even without
having any hollows between the concrete base and pan and finished just below level of run of pan to receive the specified thickness of the floor finishing. A pair of foot rests for long pattern pans shall be fixed at a convenient angle where specified.

14.5.1.2 The joint between the pan and the trap shall be made with CM 1:1 and shall be leak proof.

14.5.2 **Flushing Cistern:** The flushing of the WC pan shall be done by ‘pull and let go’ flushing cistern of the valveless siphonic type conforming to IS: 774 unless otherwise specified. The cistern shall be of best quality as specified together with cover lever, GI chain and pull of specified quality, ball valve with copper or plastic float as specified and necessary unions etc. for connection with inlet and outlet pipes and overflow.

14.5.2.1 **Brackets:** The cistern shall be fixed on cast iron or rolled steel cantilever brackets which shall be firmly embedded in the wall in CM 1:3 or fixed by using wooden plugs and screws, to the satisfaction of the architects / clients engineer.

14.5.2.2 **Overflow:** The cistern shall be provided with 20mm GI overflow pipe with fittings secured in a manner which will permit it to be readily cleaned or renewed when necessary. The length of the overflow shall be as per Municipal requirements.

14.5.2.3 **Flush pipe:** The outlet or flush pipe from the high level cistern shall be of 32mm galvanised wrought iron pipe not less than 1.00mm thick or light quality of GI pipe or lead pipe as specified, which shall be connected to the WC pan by means of an approved type of joint. The flush pipe shall be fixed to wall by using holder bat clamps or embedded as required. Where lead pipe pieces are required to be used in conjunction with GI flush pipes for ensuring proper connection, the contractor shall do so at his own cost.

14.5.2.3.1 If the connection between the cistern and the WC pan is made with GI pipe, the bends and offsets shall be made cold, and connection to the pan may be made by means of an approved type of joint or white lead mixed with chopped hemp.

14.5.2.3.2 **Painting:** Brackets, overflow and flush pipe etc. shall be painted with a priming coat of red oxide, and finishing two or more coats of white zinc or any other colour and shade to match with the painting of surrounding walls.

14.6 **PEDESTAL WASH DOWN WATER CLOSET:**

14.6.1 **WC PAN:** The WC pan shall be of white vitreous china of one piece construction of wash down type with integral ‘P’ or ‘S’ trap as required. It shall be of approved quality and pattern conforming to IS specification IS: 2556 (Part II).

14.6.2 **Seat and Cover:** The seat with lid shall be of plastic seat as specified with rubber buffers and shall be fixed in position by using Chromium plated (CP) brass hinges and screws. The seat shall be non absorbive and free from cracks and crevices in the material. The plastic seat and cover where specified shall conform to IS Specifications and shall be of black colour unless otherwise specified.

14.6.3 **Flushing Cistern:** The flushing of the WC pan shall be done by high level or ‘low level’ valveless siphonic flushing cistern of approved quality, as specified. In the former case the specifications will be same as those for flushing cisterns of squatting pattern WC pans. In the latter case there shall be white glazed vitreous china or porcelain enamelled or plastic as specified of capacity cistern as specified with all internal fittings, brackets and CP brass flushing handle, which shall be fixed at low
level and connected to the WC pan by means of 40mm diameter white enamelled porcelain bend and rubber or ‘light’ quality GI pipe or 2.6mm thick lead pipe connection or as other specified.

14.6.4 Overflow: There shall be 20mm overflow with mosquito proof coupling of approved design which shall conform to the specifications as stated under squatting pattern WC pan.

14.7 BOWL URINAL

14.7.1 Bowl Urinal: The urinal shall be flat back or angular pattern lipped from basin of required dimensions of white vitreous china and one piece construction with integral flushing box rim of an approved make as specified. It shall be fixed in the position by using wooden plug embedded in the wall with screws of proper size. Each urinal shall be connected to a 40mm diameter waste lead pipe unless otherwise specified, which shall discharge into a channel or a floor trap or specified. The connection between the urinal and flush or waste pipe shall be made by means of white lead mixed with chopped hemp. The flush pipe and waste pipe shall be concealed where directed.

14.7.2 Flushing: If the flushing of the urinals is to be done by automatic flushing cisterns then the same shall conform to IS specifications. The cistern shall be of PVC type or other specified having valveless siphon automatic flushing arrangement of specified capacity. It shall be supported on a pair of R.S or C.I cantilever brackets which shall be embedded or fixed to wall by means of wooden plugs and screws. The cistern shall be connected to the urinal basin by means of a GI medium quality or a lead or specified type of flush pipe with fittings. The pipe shall be fixed by using proper holder-bat clamps or concealed by embedding as directed. The body thickness shall be not less than 6mm in the case of vitreous sanitary cistern and 1.60mm before coating in the case of pressed steel cistern. The latter should be porcelain enamelled against corrosion.

14.7.2.1 Capacity: The capacity of the flushing cistern and the size of the flush pipe for the number of urinals in a range will be as follows:

<table>
<thead>
<tr>
<th>Number of Urinals in a range</th>
<th>Capacity of flushing cistern</th>
<th>Main Size of pipe distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 litres</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>10 litres</td>
<td>20 min</td>
</tr>
<tr>
<td>3</td>
<td>12.5 litres</td>
<td>25 min</td>
</tr>
<tr>
<td>4</td>
<td>12.5 litres</td>
<td>25 min</td>
</tr>
</tbody>
</table>

14.7.2.2 The joint between the urinal basin and flush and waste pipe shall be made by means of putty or white lead mixed with chopped hemp, or as specified in case of lead pipes.

14.7.2.3 Painting: The brackets shall be painted as given under flushing cistern for squatting pattern WC pan.

14.8 STALL URINALS

14.8.1 Urinal Stalls: The urinal stall and its screens shall be of white vitreous china or approved quality and manufacture. The stall shall be 114cm high and 46cm wide and
40cm deep. The stall shall be provided with 84cm x 36cm division plates. In case of range of two or more urinals, there shall be further division plates similar to end screens. The range shall have 15cm deep thread plates of fire clay unless otherwise specified.

14.8.2 **Flushing:** The stalls shall be provided with white glazed vitreous china automatic flushing cistern of proper capacity with 6mm minimum body thickness unless otherwise specified. The cistern shall be complete with fittings and brackets which shall be fixed to the wall. The cistern shall be connected to the stall through standard size CP brass flush pipe with spreader arrangement and clamps unless otherwise specified. Capacity of flushing cistern and relevant sizes of flush pipe for stall urinals shall be the same as specified for bowl urinals.

14.8.2.1 **Outlet:** Each range of stalls shall be provided with CI urinal trap with vent arm having CP brass outlet grating of size 50mm for one or two stalls and 75mm for more stalls or as specified.

14.9 **SQUATTING PLATES**

14.9.1 **Squatting Plates:** The urinal plates shall be of white glazed vitreous china with integral flushing rim of size 600mm x 350mm as specified. There shall be white vitreous channel with stop and outlet pieces in front. The plate and channel shall be of approved quality and conform to IS specifications 2556 (Part VI).

14.9.2 **Flushing:** Each set of plates shall be provided with automatic CI cistern complete with GI flush pipe with fittings and spreader arrangements fixed with holder - bat clamps or embedded as specified. There shall not be more than four plates in a range fed by a single cistern.

14.9.2.1 **Capacity:** The capacity of the flushing cistern and the size of the flush pipe for the number of squatting plate urinals in a range will be as follows:

<table>
<thead>
<tr>
<th>Number of urinals in a range</th>
<th>Capacity of flushing cistern</th>
<th>Main</th>
<th>Size of flush pipe distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 litres</td>
<td>--</td>
<td>20mm</td>
</tr>
<tr>
<td>2</td>
<td>10 litres</td>
<td>25mm</td>
<td>20mm</td>
</tr>
<tr>
<td>3</td>
<td>12.5 litres</td>
<td>32mm</td>
<td>20mm</td>
</tr>
<tr>
<td>4</td>
<td>12.5 litres</td>
<td>32mm</td>
<td>20mm</td>
</tr>
</tbody>
</table>

14.9.2.2 The cistern shall be fixed on R.S or C.I cantilever brackets which shall be embedded of fixed to the wall by means of wooden plugs and screws.

14.9.2.3 The joint between the urinal plate and the flush pipe shall be made with putty or white lead mixed with chopped hemp.

14.9.2.4 **Painting:** The inside and outside of the cistern, the fittings and brackets shall be painted as described for flushing cistern for squatting pattern WC pan.

14.9.3. **Outlet:** The squatting plate or a range of squatting plates shall be provided with a 65mm diameter standard urinal CI trap with vent arm having 65mm CP brass outlet grating or as specified.

14.9.4. **Walling:** The squatting plate shall have 1.22m high wall in front and on either side. These shall be lined as specified.
14.10 **WASH BASINS**

14.10.1 **Basins:** The wash basin shall be of white vitreous china of approved quality, make and pattern conforming to IS specifications. It shall be of one piece construction with an integral combined overflow. The size of the basin shall be as specified.

14.10.2 **Fittings:** Each wash basin shall be provided with 15mm CP brass pillar taps as specified, 32mm CP waste with CP brass bottle trap or GI trap and plug as specified, GI chain and rubber plug, unions, joints etc. complete in all respects of approved quality.

14.10.3 **Fixing:** The basin shall be supported on a pair of R.S or CI cantilever brackets embedded or fixed in position by means of wooden cleats and screws. These brackets shall be painted to the required shade as given under flushing cistern for squatting pattern WC. The wall plaster shall be cut to rest over the top edge of the basin. After fixing the basin, plaster shall be made good and surface finished to match with the existing one.

14.10.4 **Waste connection:** The waste pipe shall discharge into a floor trap leading to a gully trap on ground floor and on upper floors it may be connected to a waste pipe stack. The CP brass bottle trap and Union shall be connected to 32mm GI light class waste pipe or lead pipe as specified which shall be suitably bent towards the wall and / or concealed in the wall as directed.

14.11 **SINKS**

14.11.1 **Sinks:** The sink shall be of white glazed fire clay with wire type overflow conforming to IS specifications unless otherwise specified. The size of the sink shall be as specified. The sink shall be of approved quality and manufacture.

14.11.2 **Fittings:** Each sink shall be provided with 40mm CP brass waste coupling and union of standard pattern. CP brass chain and 40mm rubber plug may be provided where specified.

14.11.3 **Fixing:** The sink shall be supported on CI cantilever brackets embedded, fixed into position. These brackets shall be painted to the require shade as given under flushing cistern for WCs. The wall plaster on the rear shall be cut to overhang the top edge of the sink.

14.11.4 **Waste connection:** The waste pipe shall discharge into a floor and trap leading to a gully trap on ground floor and may be connected to a waste pipe stack on upper floors. CP brass coupling and union shall be connected to 40mm GI light quality waste pipe provided with suitable tee and plug for cleaning purposes.

14.12 **TOILET REQUISITES**

14.12.1 **Mirror:** The mirror shall be of approved make glass

14.12.2 **Glass Shelf:** The shelf shall be of glass of approved quality with edges rounded off. The size of the shelf shall be as specified. The shelf shall have CP brass guard rail with rubber washers on positions resting on glass plate and CP brass brackets which shall be fixed with CP brass screws to wooden plugs firmly embedded in the wall.

14.12.3 **Towel Rail:** The towel rail shall be of CP brass with two CP brass brackets. The size of the rail shall be as specified. The bracket shall be fixed by means of CP brass screws to wooden cleats firmly embedded in the wall.
14.12.4 **Toilet Paper Holder:** The paper holder shall be wooden of CP brass or vitreous china as specified. The wooden paper holder shall be made of well seasoned teakwood finished with bees wax. These shall be fixed in position by means of CP brass screws and wooden cleats embedded in the wall.

14.12.5 **Liquid Soap Holder:** This shall be of glass or CP brass as specified. It shall be fixed in position by means of CP brass screws and wooden cleats embedded in the wall. The liquid soap holder shall be of approved size, and make.

14.12.6 **Shower Rose:** The shower rose shall be of CP brass swivelling type of approved size, make and design. Where specified, the same shall be provided with a CP brass shower arm with necessary CP brass well flange and fitting.

14.12.7 **Water connectors:** Water connection to flushing cistern, wash basins etc. shall be by means of lead pipe or white polythene pipe connection pieces to as specified with CP brass connectors on either ends and a stop cock. The size of the lead pipe or polythene pipe connection and stop cock will depend upon the size of water connection and shall be as specified. The length of the connecting pieces shall be at least 375mm.

14.13 **CAST IRON SOIL, WASTE, VENT AND RAINWATER PIPES AND FITTINGS**

14.13.1 **Cast Iron Pipe and Fittings:** Cast iron soil, waste, vent and rainwater pipes and fittings where specified shall conform to the latest ISI for these pipes. The pipes shall have spigot and socket ends and shall be with or without ears as directed by the architects / clients engineer.

14.13.2 **Weights:** The standard weights and thickness of pipes are given below and a tolerance upto minus 10% may however be allowed against these standard weights:

<table>
<thead>
<tr>
<th></th>
<th>Sand Cast</th>
<th>Spun Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal dia of pipe</strong></td>
<td><strong>Minimum thickness</strong></td>
<td><strong>Minimum thickness</strong></td>
</tr>
<tr>
<td>Mm</td>
<td>mm kg</td>
<td>mm kg</td>
</tr>
<tr>
<td>50</td>
<td>5 12.65</td>
<td>3.5 9.2</td>
</tr>
<tr>
<td>75</td>
<td>5 18.37</td>
<td>3.5 13.8</td>
</tr>
<tr>
<td>100</td>
<td>5 24.15</td>
<td>4.0 21.0</td>
</tr>
<tr>
<td>150</td>
<td>5 35.66</td>
<td>5.0 38.5</td>
</tr>
</tbody>
</table>

14.13.2.1 These shall be free from cracks and other flaws. The interior of pipes and fittings shall be clean and smooth. These pipes shall be coated internally and externally with suitable coating material having a tar or other approved base, in accordance with relevant IS specification for these pipes.

14.13.2.2 The access door fittings shall be of proper design so as not to form any cavities in which filth may accumulate. Doors shall be provided with 3mm rubber insertion packing and when closed and bolted they shall be watertight and airtight.
14.13.3 **Fixing:** The pipes and fittings shall be fixed to walls at least 5cm clear of the finished surface of wall by using proper holder - bat clamps. The pipes shall be fixed perfectly vertical or in a line as directed. The spigot end shall be about the shoulder of the socket and leave no annular space in between. The pipes shall be strongly supported at the foot by a bed of cement concrete 1:3:6, 150mm. All soil pipes shall be carried up above the roof and shall have a suitable cowl. The bends in the bottom most soil or waste stack shall necessarily be of long radius and preferably made of two 135 degree C CI bends.

14.13.3.1 Connections between main pipe and the branch pipes shall be made by using proper branches and bends invariably with access doors for cleaning.

14.13.4 **Cement Mortar Joints:** Where specified, the pipes jointed with cement mortar joints shall be as under:

Closely twisted spun yarn gasket of such diameter as required to support the spigot of pipe at the proper grade and make truly concentric joints, and in one piece of sufficient length to pass around the pipe and lap at the top, shall be thoroughly saturated in cement paste. This gasket shall be laid in the socket for the lower third of the circumference of the joint and covered with cement mortar 1:1. The spigot of the pipe shall be thoroughly cleaned with a wet brush, inserted and carefully driven home after which a small amount of mortar shall be inserted in the annular space around the entire circumferences of the pipe and solidly rammed into the joint with a caulking tool, the mortar previously placed being driven ahead of the gasket. The remainder of the joint shall then be completely filled with CM: 1:1 and bevelled off at an angle of 45 degree with the outside of the pipe.

14.13.4.1 Where any water closet pan or earthen ware pan connected to such pan is to be jointed with CI soil pipe, the joint between the pan/ trap and the socket of the CI pipe shall always be of a flexible nature and such joint shall be made with a mixture of bitumen and chopped asbestos fibre (not dust).

14.13.5 **Lead Caulked Joints:** Where the pipes are to be jointed with lead caulked joints, the same shall be done as follows.

The annular space between the socket and spigot will be first well packed in with spun yarn leaving 25mm from the lip of the socket for lead. The joint may be leaded by using proper leading rings of if they are not available by wrapping a ring of hemp rope covered with clay round the pipe at the end of the socket, leaving a hole through which lead shall be poured in (for pipes with sockets facing upwards 12mm high clay bund on the socket edge may be used).

14.13.5.1 The lead shall be rendered thoroughly fluid and each joint filled in one pouring. Before caulking, the projecting lead shall be removed by flat chisels and then the joint caulked round with proper caulking tools and a hammer of 1 to 1.50kgs. in weight in such a manner as to make the joint quite sound. After being well set up the joint is to be left flush, neat and even with the socket.
14.13.6 **Testing:** All cast iron pipes and fittings including joints will be tested for gas tightness by a smoke test and hydraulic performance by a water test and left in working order after completion.

14.13.6.1 **Smoke Test:** Smoke shall be pumped into the drains at the lowest end from a smoke machine which consists of a blow and burner. The materials usually burnt are greasy cotton waste which form clear pungent smoke which is easily detectable by sight as well as by smell if leaking at any point of the drain.

14.13.6.2 **Water Test:** The water test may be applied before the appliances are connected any may be carried out in sections so as to limit the static head to 4.5 metres.

14.13.6.3 The contractor will have to rectify all defects traced in such tests at his own expense to the satisfaction of the architects / clients engineer.

14.13.7 **Painting:** All the exposed CI pipes and fittings shall be painted with two coats of oil paint of approved quality, manufacture, colour and shade to match the surroundings.

14.13.7.1 The surface of the pipes and fittings to be painted shall be cleaned thoroughly. Red oxide or other approved primer shall be painted and allowed to dry. The finishing shall be done by painting two or more coats with paint in an approved colour and shade.

14.13.8 On no account shall lime mortar or lime concrete come in direct contact with CI pipes.

14.14 **ASBESTOS CEMENT RAINWATER, SOIL, WASTE AND VENT PIPES AND FITTINGS**

14.14.1 **Pipes and Fittings:** Asbestos cement rainwater soil, waste and vent pipes and fittings shall conform to the latest ISI for these types of pipes. The pipes shall have spigot and socket ends. The access door fittings shall be proper design so as not to form any cavity in which filth may accumulate. Doors shall be provided with 3mm rubber insertion packing and when closed and bolted they shall be watertight and airtight.

14.14.2 **Thickness and Sizes:** The standard thickness and sizes with permissible tolerance of the dimension for pipe and fittings shall be as given below:

<table>
<thead>
<tr>
<th>Nominal Diameter of Pipe or Fitting (mm)</th>
<th>Thickness of Pipe or Fitting (mm)</th>
<th>Permissible variation in thickness</th>
<th>Permissible variation in External Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>6.5</td>
<td>+ or - 1.0</td>
<td>+ or - 1.5</td>
</tr>
<tr>
<td>60</td>
<td>6.5</td>
<td>+ or - 1.0</td>
<td>+ or - 1.5</td>
</tr>
<tr>
<td>80</td>
<td>8.0</td>
<td>+ or - 1.0</td>
<td>+ or - 1.5</td>
</tr>
<tr>
<td>90</td>
<td>8.0</td>
<td>+ or - 1.0</td>
<td>+ or - 1.5</td>
</tr>
<tr>
<td>100</td>
<td>8.0</td>
<td>+ or - 1.0</td>
<td>+ or - 1.5</td>
</tr>
<tr>
<td>125</td>
<td>9.5</td>
<td>+ or - 1.5</td>
<td>+ or - 2.5</td>
</tr>
<tr>
<td>150</td>
<td>9.5</td>
<td>+ or - 1.5</td>
<td>+ or - 2.5</td>
</tr>
</tbody>
</table>

14.14.3 The pipes and fittings shall be fixed to walls atleast 5cm clear by using proper holder bats clamps weighing 1 to 1.5kgs. each. The spigot end shall about the shoulder of the socket and leave no annular space in between. All soil pipes shall be carried up above
the roof and shall have an AC cowl. The bends in the bottom most soil or waste stack shall necessarily be of CI long radius and preferably made of two 135 degree CI bends.

14.14.4 Connections between main pipe and the branch pipes shall be made by using proper branches and bends invariably with access doors for cleaning.

14.14.5 **Jointing:** AC pipes shall be jointed with CM joints 1:1 as described for CI pipes.

14.14.6 **Testing:** The joints of pipes shall be tested by smoke test and water test as described for CI pipes.

14.14.7 **Painting:** AC pipes shall be painted to match the surroundings.

14.15 **LEADPIPES**

14.15.1 **Lead Pipes:** All lead pipes shall be hydraulic drawn and of equal substance throughout and shall confirm to the relevant IS specifications. When not supported on bearers, all lead pipes shall be supported by strong lead tracks at least 40mm wide soldered on the pipes at suitable intervals. The size and weights of these pipes for flushing and soil, waste and ventilating pipes shall be as given in table below:

<table>
<thead>
<tr>
<th>Nominal Internal diameter (mm)</th>
<th>Wall Thickness (mm)</th>
<th>Weight Per Metre (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2.60</td>
<td>2.09</td>
</tr>
<tr>
<td>25</td>
<td>2.60</td>
<td>2.56</td>
</tr>
<tr>
<td>32</td>
<td>2.60</td>
<td>3.28</td>
</tr>
<tr>
<td>40</td>
<td>2.60</td>
<td>3.95</td>
</tr>
<tr>
<td>50</td>
<td>2.70</td>
<td>5.07</td>
</tr>
<tr>
<td>75</td>
<td>2.70</td>
<td>7.48</td>
</tr>
<tr>
<td>100</td>
<td>2.70</td>
<td>9.88</td>
</tr>
<tr>
<td>150</td>
<td>3.00</td>
<td>16.36</td>
</tr>
</tbody>
</table>

14.15.2 **Wiped Solder Joints:** All joints of lead pipes shall be wiped solder joints as described below:

The pipe ends to be jointed shall be cleaned with a wire brush and freed from oxide if any. Chalk shall then be rubbed to kill the greasy nature of the lead. After this, plumbers black shall be applied. The length of the joint as given below shall then be marked on the pipe. A fine shaving of lead shall be removed from this length with a shave hook. Tallow shall then be smeared over the prepared surface. The molten solder, an alloy composed of 3 parts of tin and 7 parts of lead, shall be poured in a thin stream form a ladle moved in an elliptical direction over the joint position including a portion of the soiled pipe at each end beyond the mark. When sufficient solder has been poured the joint shall be wiped with a pad of wiping cloth with long continuous movements in one direction only so as to leave a neatly formed elliptical shaped joint. Surplus solder remaining on the joint shall be removed with a tool called “draw of”.

14.15.2.1 The minimum and maximum length of the wiped solder joint shall be 8cm and 9cm respectively.
14.15.2.2 The joints shall be watertight, airtight and shall be free from tears, burrs, strings, ribands or droppings.

14.15.3 **Cleaning access:** Brass screw cleaning or trap is connected with a lead soil, waste, or vent pipe or trap, there shall be inserted between the two, a 4.5mm thick brass ferrule sor thimble 150mm long which shall be slipped into or over the lead pipe and jointed to it by means of a wiped solder joint. The other end of the ferrule shall then be inserted into the socket of the cast iron or stoneware pipe. In the case of former, the joint shall be made with molten lead (lead caulked) and in case of the latter with CM 1:1 as in stoneware pipe drains.

14.15.4 The joints between outgo of a WC pan and a lead pipe shall be made as under:

The lead pipe shall be slipped into a brass thimble or socket and jointed to it by a wiped solder joint. The outgo of a WC pan shall then be inserted into the socket and jointed by using cement mortar as in stoneware pipe drains.

14.15.5 **Painting:** All exposed lead pipes shall be painted as in cast iron pipes and fittings.

14.16 **PLUMBERS BRASS WORK AND WATER AND WASTE FITTING**

14.16.1 **General:** Generally, the whole of plumbers brass work or gunmetal fittings shall be of heavy quality and approved manufacture and pattern. They shall in all respects comply with the latest ISI. Brass castings for valves, unions, thimbles, ferrules, taps, traps, waste etc. shall be in all respects sound and good, free from laps, blow holes and fittings, stops or patches. The fittings shall be fixed in the pipe line in a workmanlike manner. Care shall be taken to see that joints between fittings and pipes are made leak proof. The fittings and joints shall be tested to a pressure of 20 kg. per Sq.cm. unless otherwise specified. The defective fittings and the joints shall be repaired, redone or replaced. Brass work requiring connection to lead pipes shall have tinned ends.

14.16.2 **Screw down bib and stop taps:** These shall be of cast brass of bronze, of ‘polished bright’ or ‘chromium plated’ finished and of size as specified and shall conform to IS: 781.

14.16.2.1 Unless otherwise indicated, the minimum finished weights of bib taps and stop taps shall be as given below:

<table>
<thead>
<tr>
<th>Size in mm</th>
<th>Minimum finished weight in kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bib taps</td>
</tr>
<tr>
<td>15</td>
<td>0.40</td>
</tr>
<tr>
<td>20</td>
<td>0.75</td>
</tr>
<tr>
<td>25</td>
<td>1.25</td>
</tr>
<tr>
<td>32</td>
<td>-</td>
</tr>
<tr>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>50</td>
<td>-</td>
</tr>
</tbody>
</table>
14.16.2.2 Washers for cold water taps shall be of selected leather, rubber asbestos composition or on plastics as directed. Washers for hot water taps shall be of good quality fibre or rubber asbestos composition as directed.

14.16.3 **Pillar Taps:** Pillar taps shall be of cast brass of chromium plated finish and of size as indicated and shall conform to IS 1795. Washers shall be of materials as for bib taps and stop taps.

14.16.4 **Ball Valves:** Ball valves shall be of high pressure type, made of (excluding the float or ball) brass of size indicated and shall conform to IS: 1703. The float shall be of copper sheet or polythene as indicated. Unless otherwise indicated, the minimum finished weights of ball valves (exclusive of the float), and those of copper floats shall be as below:

<table>
<thead>
<tr>
<th>Nominal size in mm</th>
<th>Ball valve exclusive of float</th>
<th>Copper float</th>
<th>Diameter of float in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0.30</td>
<td>0.22</td>
<td>127</td>
</tr>
<tr>
<td>20</td>
<td>0.47</td>
<td>0.32</td>
<td>152</td>
</tr>
<tr>
<td>25</td>
<td>0.87</td>
<td>0.68</td>
<td>203</td>
</tr>
<tr>
<td>32</td>
<td>1.20</td>
<td>0.92</td>
<td>229</td>
</tr>
<tr>
<td>40</td>
<td>1.65</td>
<td>1.05</td>
<td>254</td>
</tr>
<tr>
<td>50</td>
<td>1.92</td>
<td>1.53</td>
<td>305</td>
</tr>
</tbody>
</table>

14.16.4.1 The minimum thickness of the copper sheet used for making floats shall be 0.55mm

14.16.5 **Syphon traps (Galvanised malleable iron or brass):** Traps for lavatory basins, sinks and baths shall be of CP brass unless otherwise specified or GI of approved manufacturers. Traps for lavatory basins and sinks shall have one inspection eye, fitted with screw plug and washer, while for baths the traps shall have 2 branches screwed externally, one of which shall be fitted with washered cap and other with a vent tail pipe and union nut for overflow connection. A loose coupling nut shall be fitted to the inlet for coupling to the waste and the outlet shall be either tails for lead pipe or screwed with pipe thread and provided with union tail and pipe.

14.16.6 **Waste fittings:** Waste fittings shall be brass chromium plated conforming to IS 2963. Sink waste shall be of 40mm bore and wash basin waste shall be 32mm bore, unless otherwise specified.

14.16.7 **Waste plug and accessories:** Waste plug shall be of hard rubber or other equally suitable material and shall conform to IS: 3311. The depth and thickness of the plug shall be such as to provide the required rigidity and water tightness. Each waste plug shall have a loose shackle. The shackle and other metal components shall be of corrosion resistant material.

14.16.7.1 Plug chains shall be made of brass or bronze wire, of diameter not less than 1.80mm, with brazed oval links approximately 13mm in length.

14.16.7.2 Chain stays shall be of brass of bronze and shall be of bolt or screw type as indicated.

14.16.8 **Lead traps:** These shall be of size and pattern as indicated. The weights of lead sheets used in manufacture of traps shall be not less than 30 Kg/Sqm.
14.16.8.1 The traps shall be supplied with brass screw caps, the screw of which shall be lead burnt or soldered to the trap with a well reinforced joint. Neither the screwed end of the cap, when screwed home, nor the sleeve shall protrude beyond the inner surface of the trap. A washer to render the cap watertight shall be supplied with every cap.

14.16.9 **Gate Valve:** The valves used for cold water services shall be of gun metal and conform to Class - I type of IS 778. For hot water installations Class - II valves shall be used. The gate valves shall be of the full way opening type with a metallic hand wheel fixed on the head of the spindle. The valves shall have screwed or flanged ends as approved by the architects / clients engineer.

14.16.10 **Globe Valves (Screw down stop valves):** These shall be of gun metal Class - I type for cold water services conforming to IS: 778 unless otherwise specified. The valves shall have screwed or flanged ends as directed. They shall be suitable for horizontal or vertical use as directed.

14.16.11 **Check (Non return) Valves:** These shall be of gun metal Class - I type for cold water services conforming to IS: 778 unless otherwise specified. The valves shall have screwed or flanged ends as directed. They shall be suitable for horizontal or vertical use as directed.

14.16.12 **Foot Valves:** Foot valves shall be of swing or lift type and provided with brass strainer and conform to the requirements of IS: 4038. The ends shall be screwed or flanged as directed.

14.16.13 **Nahani Traps:** The traps shall be of cast iron and self cleaning design. The traps shall be of specified size and fitted with a hinged CP brass or cast iron grating as specified.

14.16.13.1 The grating shall be fixed flush with the floor while the trap shall rest on a 1:6 CM bed.

14.16.13.2 Where one pipe or single stack system of plumbing is employed it shall be essential to provide deep seal cast iron floor traps of effective water seal 50mm complying with the requirements of ISI.

14.17 **WATER TANKS**

14.17.1 **Water Tanks:** Hoisting of ready-made mild steel, galvanised iron, RCC or Asbestos cement water tanks into position shall be carried out with proper tackle, care being taken that no part of the tank or of the structure is damaged with operation. The tanks shall be installed truly level. Steel tanks of capacity upto 1,800 litres (Mild steel or Galvanised Iron as specified) shall be of 5.5mm thick sheet welded to 32mm x 32mm x 6mm angle iron frame complete with MS cover and frame weighing 15 kg with locking arrangement including providing pads of size as required for inlet and outlet pipes.

GI overflow pipe piece with mosquito proof couplings and scour pipe with backing nut of required sizes shall be also provided. Supports for tanks shall be provided as specified shall be measured and paid for separately.

14.17.2 **Pipe Inserts:** GI pipes inserts to be kept in position for outlets, washouts and inter connection of tanks while casting RCC water tanks shall be of the specified size and diameter and shall be threaded throughout its length. A 150mm x 150mm MS plate 6mm thick shall be welded centrally on to the threaded body of pipe as directed.

14.17.3 **Overflow pipes:** Overflow pipe inserts for tanks shall be of the specified size and diameter with an approved mosquito proof coupling.
C. DRAINAGE

14.18 SALT GLAZED STONEWARE PIPE DRAINAGE:

14.18.1 Pipes: All pipes and fittings must be new and perfectly sound, free from fire cracks and imperfections of glazing, cylindrical and of standard nominal diameter, length and depth of socket. They shall be made of hard burnt stoneware of dark grey colour and thoroughly salt glazed inside and outside. These pipes and fittings shall conform to grade “A” of the relevant latest IS specifications for these pipes and fittings, unless otherwise specified.

14.18.2 Excavation of trenches for salt glazed stoneware pipes: Excavation of trenches and connected works such as road crossing, protection of existing services lighting and watch etc. shall generally be carried out in accordance with the procedure described earlier in respect of Cast Iron pressure pipes and fittings. Trenches for drainage work shall be carried out to the required levels. Use of sight rail and boning rods shall be adopted during the whole process of excavation and laying of pipes. Any excess excavation more than required shall be made good in 1:3:6 PCC at contractor’s cost.

14.18.3 Concrete support or protection: Where it is desired to support or surround pipe sewers or drain, it shall be done in concrete 1:4:8 by adopting one of the following methods as specified.

14.18.3.1 Bedding: Bedding shall be rectangular in section and shall extend laterally at least 15cm beyond on both sides of the projection of the barrel of the pipe. The thickness of the concrete, below the barrel of the pipe shall be not less than 10cm for the pipes under 15cm diameter and be not less than 15cms for pipes 15cm and over in diameter. Where bedding is used alone, the concrete shall be brought up atleast to the invert level of the pipe to form a cradle and to avoid line contact between the pipe and the bed.

14.18.3.2 Haunching: Concrete haunching shall consist of a concrete bed as described for bedding with the full width of the bed carried upto the level of the horizontal diameter of the pipe and splays from this level carried up on both sides of the pipe from the full width of the bed to meet the pipe barrel tangentially.

14.18.3.3 Surround or encasing: The surround or encasing shall be similar to haunchings upto the horizontal diameter of the pipe and the top portion over this shall be finished in a semi-circular form to give a uniform encasing for the top half of the pipe. Encasement may be provided when the maximum subsoil water table is likely to rise above the top of barrel or where there is insufficient earth cover over the top of the barrel.

14.18.4 Laying of Pipes: Pipes shall be carefully laid to the levels and gradients shown on the plans. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between the man holes shall be laid truly in straight line without vertical or horizontal undulations. The pipes shall be laid with the socket leading uphill. The body of the pipe shall for its entire length rest on an even bed of concrete and places shall be excavated in the concrete to receive the socket of the pipe.

14.18.5 Jointing: In each joint, tarred gasket or spun yarn soaked in neat cement slurry shall be passed round the joint and inserted in it by means of a caulking tool. More skeins of yarn shall be added and well rammed home.

14.18.5.1 The object of the yarn is to centre the spigot of one pipe within the socket of the other and to prevent the CM of the joint penetrating into the pipes.
14.18.5.2 CM 1:1 shall be slightly moistened and must on no account be soft or sloppy and shall be carefully inserted by hand into the joint. The mortar shall then be punched and caulked into the joint and more cement mortar added until the space of the joint has been filled completely with tightly caulked mortar. The joint shall then be finished off neatly outside the socket at an angle of 45 degree.

14.18.5.3 Any surplus mortar projecting inside the joint shall be removed and to guard against any such protections, sack or gunny bag shall be drawn past each after completion.

14.18.6 **Curing:** The cement mortar joints shall be cured at least for seven days, before testing.

14.18.7 **Quantity of Cement and Spun yarn:** The approximate quantity of cement and spun yarn required for each joint for certain common sizes of pipes are given below for guidance.

<table>
<thead>
<tr>
<th>Nominal dia of pipe mm</th>
<th>Cement kg.</th>
<th>Spun yarn kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1.0</td>
<td>0.25</td>
</tr>
<tr>
<td>150</td>
<td>1.5</td>
<td>0.35</td>
</tr>
<tr>
<td>200</td>
<td>2.0</td>
<td>0.70</td>
</tr>
<tr>
<td>250</td>
<td>2.5</td>
<td>0.80</td>
</tr>
<tr>
<td>300</td>
<td>3.25</td>
<td>1.10</td>
</tr>
<tr>
<td>350</td>
<td>4.5</td>
<td>1.25</td>
</tr>
<tr>
<td>400</td>
<td>5.5</td>
<td>1.50</td>
</tr>
</tbody>
</table>

14.18.8 **Jointing SW pipes with CI pipes:** Where any CI soil, waste or ventilating pipe or trap is connected with a stoneware pipe communicating with a sewer, the bedded spigot end of such CI pipe or trap shall be inserted into a socket of such SW pipe drain and the joint made with CM 1:1

14.18.9 **Testing:** All joints shall be tested to a head of 60cms of water above the top of the highest pipe between two man holes.

14.18.9.1 The lowest end of the pipe shall be plugged watertight. Water shall then be tilted in manhole at the upper end of the line. The depth of water in the manhole shall be 60cm plus the diameter of the pipe. The joints shall then be examined. Any joint found leaking or sweating shall be remade or embedded into 15cm layer of cement concrete 1:2:4, 30cms in length and the section retested, at the contractor’s expense until satisfactory results are obtained.

14.18.10 **Refilling:** Refilling in trenches for pipes shall be commenced as soon as the joints and concrete have been passed. The refilling on the top and around the drain shall be done with great care and in a manner as will obtain the greatest amount of compactness and solidity possible. For this purpose the earth shall be laid in regular layers of 15cm watered and rammed at each layer. All surplus earth shall be disposed of as directed by the architects / clients engineer.
14.19  STONEWARE STORM WATER DRAINS:

14.19.1 Storm Water Drains: When SW pipes are used for storm water drainage, no concreting will be necessary. The cement mortar for jointing will be 1:3 or as specified. To avoid clogging of drains, both ends shall be kept plugged until the construction of manholes is completed in every respect. On completion care shall be taken that each plug is removed and the face of the drain made smooth.

14.20  STONEWARE GULLY TRAPS:

14.20.1 Gully Trap: This must be new, perfectly sound free from fire cracks and other imperfections of glazing, of standard nominal diameter and other dimensions. It shall be made of hard burnt stoneware of dark grey colour and thoroughly salt glazed inside and outside.

14.20.1.1 Each gully trap shall have one CI grating 15 x 15cm and one water tight CI cover with frame 30 x 30cm (inside dimensions) with machined seating faces.

14.20.2 Excavation: The excavation for gully traps shall be done true to dimensions and levels as indicated on plans or as directed by the architects / clients engineer.

14.20.3 Fixing: The gully trap shall be fixed on cement concrete foundation 70cm Square and not less than 10cm thick. The mix for the concrete will be 1:4:8 (1cement, 4 sand and 8 stone ballast 40mm). The joining of gully outlet to the branch drain shall be done similar to jointing of SW pipes.

14.20.4 Masonry Chamber: After fixing and testing the gully and branch drain, a brick masonry chamber 30 x 30cm (inside) in first class brick in cement mortar 1:4 shall be built with 11cm thick wall round the gully trap from the top of the bed concrete upto ground level, the space between the chamber walls and the trap being filled in with cement concrete of the specifications of bed concrete. The chamber shall be plastered internally and externally with cement mortar 1:3 (1cement: 3 sand) finished with a floating coat of neat cement. The corners and bottom of the chamber shall be rounded off so as to slope towards the grating.

14.20.5 CI Cover: CI cover with frame 30 x 30cm (inside) or as specified with machined seating faces shall then be fixed on the top of the brick masonry with cement concrete 1:2:4 and rendered smooth. The finished top of cover shall be left 5cm above the adjoining ground level so as to exclude the surface water from entering the gully trap.

14.21  REINFORCED CEMENT CONCRETE PIPE DRAINAGE:

14.21.1 RCC Pipes: All pipes and fittings must be new and perfectly sound, free from cracks, cylindrical straight and of standard nominal diameter and length. They shall be made of reinforced cement concrete, manufactured by centrifugal or spun process and shall have an even texture.

Each pipe shall have one collar with it. The pipes shall conform to latest ISI and shall be of “NP2” class, unless otherwise specified.

14.21.2 Excavation of Trenches: Excavation of trenches and connected works such as road crossings, protection of existing services, lighting and watch etc. shall generally be
carried out in accordance with procedure described earlier of Cast Iron Pressure Pipes and stoneware pipes.

14.21.3 **Concrete Support:** Chairs made of cement concrete shall be used unless otherwise specified for supporting pipes. These shall be provided at suitable intervals which shall not exceed the length of pipe. In cases where the soil is made up or is very soft, other forms of concrete supports may be resorted to form the bed of the trench below the pipe as directed by the architects / clients engineer.

14.21.4 **Laying:** The pipes shall be carefully laid to levels and gradients shown in the plans and sections. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in straight lines without vertical or horizontal undulations.

14.21.5 **Jointing:** A few skeins of spun yarn soaked in neat cement wash shall be inserted in the groove at the end of the pipe and the two adjoining pipes butted against each other. The collar shall then be slipped over the joint, covering equally both the pipes. Spun yarn soaked in neat cement wash shall be passed round the pipes and inserted in the joint by means of caulking tools from both the ends of the collar. More skeins of yarn shall be added and well rammed home.

14.21.5.1 The object of the yarn is to centre the two ends of the pipes within the collar, and to prevent the cement mortar of the joint penetrating into the pipes.

14.21.5.2 Cement mortar 1:1 (1 cement: 1 sand) shall be slightly moistened, and must on no account be soft or sloppy and shall be carefully inserted by hand into the joint. The mortar shall then be punched and caulked into the joint and more cement mortar added until the space of the joint has been filled completely with tightly caulked mortar. The joint shall be finished off neatly outside the collar on both sides at an angle of 45 degree.

14.21.5.3 Any surplus mortar projecting inside the joint is to be removed and to guard against any such projections sack or gunny bag shall be drawn past each joint after completion.

14.21.6 **Curing:** The cement mortar joints shall be cured at least for ten days.

14.21.7 **Testing and Refilling:** This shall be the same as described for SW pipe drains except that in the case of testing, the head of water for testing shall be 2 metres above the top of the highest pipe between two manholes.

14.22 **CEMENT CONCRETE STORM WATER DRAINS :**

14.22.1 **Storm Water Drains:** When concrete pipes are used for storm water drainage, the cement mortar for the jointing shall be 1:3 (1 cement: 3 sand), or as specified. To avoid clogging of drains, both ends shall be kept plugged until the construction of manholes is completed in every respect. On completion care shall be taken that each plug is removed and the face of the drain made smooth.

14.23 **CAST IRON PIPE DRAINAGE :**

14.23.1 **Applications:** CI pipe drainage may be adjusted in the cases mentioned below where specified:
(a) In bad or unstable ground where soil movement is expected.
(b) In made-up or tripped ground.
(c) To provide for increased strength where a sewer is laid at insufficient depth, where it is exposed or where it has to be carried on piers or above ground, and
(d) Under buildings and where pipes are suspended in basements and like situations.

14.23.2 **Pipes:** The pipes used shall conform to the latest ISI IS: 6163 for CI spigot and socket pipes unless otherwise specified.

14.23.2.1 All pipes shall be coated inside and outside while hot with an approved anti-corrosive paint having a tar or other suitable base.

The nominal weights of the pipes shall be as per details below:

<table>
<thead>
<tr>
<th>Nominal dia. of pipe Mm</th>
<th>Nominal weight of pipes including socket length for pipes of overall length 3.66M kg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>44</td>
</tr>
<tr>
<td>100</td>
<td>52</td>
</tr>
<tr>
<td>150</td>
<td>85</td>
</tr>
<tr>
<td>200</td>
<td>135</td>
</tr>
</tbody>
</table>

14.23.3 **Excavation in Trenches, laying and jointing, refilling etc.:** Specifications for trenches and connected works for laying and jointing, refilling cast iron pressure pipes and stoneware pipes shall apply in this case.

14.23.4 **Concrete supports:** In normal ground, no concrete support or protection to CI pipes need be provided. Where supporting piers are specified, these shall not be less than 30cm in length (parallel to the axis of pipe) and at least equal in section to that described for hunching under concrete supports for SW pipes. Piers shall be built just behind the pipe sockets intermediate piers being provided where necessary.

14.24 **BRICK MASONRY OPEN SURFACE DRAINS:**

14.24.1 **Surface Drains:** The top of the drain shall always be kept 50 to 75mm above adjoining ground level so as not to admit storm water from surrounding area into it. The overall depths of the various sizes of drains shall be as follows:

<table>
<thead>
<tr>
<th>Drain Size</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>10cm</td>
<td>15cm</td>
</tr>
<tr>
<td>15cm</td>
<td>23cm</td>
</tr>
<tr>
<td>23cm</td>
<td>30cm</td>
</tr>
</tbody>
</table>

14.24.1.1 The earth excavation shall be done true to levels and lines. The drains shall be built in 1st class brick in CM 1:5 over a 10cm bed of cement concrete 1:5:10. The inside bottom corners of the drain shall be rounded off by means of fine cement concrete 1:2:4. Inside of the drain, top and sides of the brick work shall be plastered with 12mm cement mortar 1:3 finished with a floating coat of neat cement. The drain may be given as far as possible a uniform slope from the starting point to the discharging point.

14.24.1.2 **Brick Masonry Drains with Stoneware Glazed Channels:** The work shall be carried out as per specifications of open surface drains except that the cement plaster of the inside of the drain shall be omitted and stoneware glazed channel of proper size shall be fixed in drain with cement mortar 1:1.
14.25 MANHOLES AND INSPECTION CHAMBERS:

14.25.1 Chambers: At every change of alignment, gradient or diameter of a drain, there shall be a manhole or inspection chamber. The maximum distance between manholes shall not exceed 30 metres.

14.25.2 Size: The size of the manhole or inspection chamber specified shall be the internal size of the manhole (between brick faces). The work shall be done strictly as per drawings and specifications.

14.25.3 Excavation: The manhole shall be excavated true to dimensions and levels, shown on the plan or as directed by the architects / clients engineer.

14.25.4 Brick work: The bricks shall be of first quality, best locally available and from approved source. The brick work shall be laid in cement mortar 1:3. The joints shall be made thoroughly leak proof.

14.25.5 Plaster: The walls shall be plastered both inside and outside with 20mm thick cement plaster 1:3. Where subsoil water condition exists, the outside surface of the walls shall be plastered with the addition of approved waterproof compound.

14.25.6 Foundation concrete: The manhole / inspection chambers shall be built on a base of cement concrete of mix 1:4:8 of thickness of atleast 15cms for chambers upto 1M depth, atleast 20cms for chamber from 1M to 1.5M depth and atleast 30cms for inspection chamber of greater depth.

14.25.7 Pointing: Pointing shall be done with cement mortar 1:2 wherever required.

14.25.8 Channels and Benching: The channels and benching shall be done in cement concrete 1:2:4 and rendered smooth to the grade with cement mortar 1:2. The channel shall be semicircular in the bottom half and of diameter equal to the sewer. Above the horizontal diameter, the sides shall be extended vertically to the same level as the crown of the outgoing pipe and the top edge shall be suitably rounded off.

14.25.9 RCC Cover Slab: Cover slab shall be of RCC 1:2:4 of 100mm thickness or other specified with steel reinforcement as per details.

14.25.10 Foot Rests: Foot rests shall be provided in all inspection chambers and manholes over 0.8M in depth and shall be of CI square flats 25mm weighing atleast 4.50Kg. or as specified and shall be painted with coal tar. These shall be embedded in masonry in CM atleast 25cm, while the brick work is in progress. They shall be set staggered into two vertical runs which may be 38cms apart horizontally and 30.5cms apart vertically. The top foot rest shall be 45cms below the manholes cover and the lowest not more than 30cms above the benching.

14.25.11 Levels of invert: Sewers of unequal sectional area should not joint with level inverts in a manhole, but the crown of the sewers shall be kept at the same level and necessary slope given in the invert of the manhole chamber. The branch sewer should deliver sewage in the manhole in the direction of main flow and the junction must be made with care so that flow in the main is not impeded.

14.25.12 House connections: No drain from house fittings e.g. gully trap or soil pipe etc. to manhole shall exceed a length of 6 metres unless it is unavoidable.

14.25.13 Measurements: The depth of manhole shall be reckoned from the invert level of the channel to the top of the CI cover. The depth shall be measured correct to nearest cm.

14.25.14 Manhole up to 1 metre depth: This shall be of 0.80 M x 0.80 M size unless otherwise specified and is generally constructed within compounds for house drainage only. The thickness of brick walls shall not be less than 23 cms.
14.25.15 **Manholes of depths between 1.00M and 1.50M:** This shall be of 1.2M x 0.9M unless otherwise specified. The thickness of brick walls shall not be less than 23cms.

14.25.16 **Manholes of depths more than 1.5 metres:** Circular chamber with a minimum diameter of 1.4 metres or rectangular chambers with minimum internal dimensions of 1.2M x 0.9 Metre shall normally be provided unless otherwise specified. The brick work for the portion exceeding 1.5 Metres and upto 2.20 Metres shall normally be of 34.5 cms thickness, unless otherwise specified.

14.25.17 **Drop Manholes:** Where it is impractical to arrange the connection of the branch pipe sewer within 60cm of the invert of the outgoing sewer in the manhole, a drop connection shall be provided. If the differences in level between the in-coming drain and the sewer does not exceed 60cm. The connecting pipe may be directly brought through the chamber wall and the fall accommodated by constructing a ramp in the benching of chamber.

14.25.17.1 The connection shall be made by constructing a vertical shaft outside the manhole chamber as shown in drawing or directed by the architects / clients engineer.

14.26 **CI MANHOLE COVERS :**

14.26.1 **Covers:** The CI manhole covers and frame shall be cleanly cast and shall be free from air and sand holes, cold shut and warping which are likely to impair utility and castings. They shall be of tough homogeneous cast iron, of Heavy, Medium or Light Duty type as specified. The sizes specified are the clear internal dimensions. The minimum weights of the various types of manhole covers with frames and their internal sizes will be as given below.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Clean opening</th>
<th>Minimum weight of cover</th>
<th>Minimum weight of frame</th>
<th>Total weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Heavy duty circular</td>
<td>500 dia.</td>
<td>118 kg.</td>
<td>111 kg.</td>
<td>229 kg.</td>
</tr>
<tr>
<td>2</td>
<td>Medium duty rectangular</td>
<td>455 x 610</td>
<td>80 kg.</td>
<td>64 kg.</td>
<td>144 kg.</td>
</tr>
<tr>
<td>3</td>
<td>Medium duty circular</td>
<td>500 dia.</td>
<td>58 kg.</td>
<td>58 kg.</td>
<td>116 kg.</td>
</tr>
<tr>
<td>4</td>
<td>Light duty rectangular</td>
<td>455 x 610</td>
<td>29 kg.</td>
<td>23 kg.</td>
<td>52 kg.</td>
</tr>
</tbody>
</table>

14.26.2 **Manhole covers with double seal** shall be used near buildings and within compounds. When the inspection chamber is built in domestic premises where they are not subjected to wheeled traffic load light duty CI covers may be used. When it is built within the metalled width of the road under heavy vehicular traffic, it shall be provided with heavy duty CI cover. Medium duty covers shall be used for light traffic conditions such as internal approach roads and cycle tracks.

14.26.2.1 The covers used in manholes on sewer lines shall invariably bear the word “SEWER” on the top, and those used for storm water drains shall bear the word ‘S.W.D.’ These markings shall be done during casting of the covers.

14.26.2.2 The frame of manhole cover shall be embedded firmly in the RCC slab or plain concrete as the case may be on the top of the masonry.
14.26.2.3 After the completion of the work manhole covers shall be sealed by means of thick motor grease. All exposed surfaces of the frames and covers shall be painted with coal tar.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>MATERIAL</th>
<th>MAKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cement (OPC) Grade 53 &amp; 43</td>
<td>L&amp;T, Coramandal, ACC, Ambuja Cement, Birla</td>
</tr>
<tr>
<td>2</td>
<td>Reinforcement Steel</td>
<td>TISCO-Tata Steel, Jindal, Sail, Essar Steel (Approved by TRFI)</td>
</tr>
<tr>
<td>3</td>
<td>Waterproofing compounds / Construction chemicals.</td>
<td>Fosroc, Roffee, Dr.Fixit, Sika.</td>
</tr>
<tr>
<td>4</td>
<td>Mosaic tiles</td>
<td>Parijata tiles, Jyothi, Nitco, Bharati, Basant</td>
</tr>
<tr>
<td>5</td>
<td>Ceramic tiles</td>
<td>Kajaria, Bell, Johnson, Regency, Somany</td>
</tr>
<tr>
<td>6</td>
<td>Vitrified tiles</td>
<td>Bell, Nitco, Kajaria, Johnson, Somany</td>
</tr>
<tr>
<td>7</td>
<td>Glazed tiles</td>
<td>Johnson, Somany, Kajaria</td>
</tr>
<tr>
<td>8</td>
<td>Cement Tiles for pavement</td>
<td>Eurocon , Ultra, Nitco.</td>
</tr>
<tr>
<td>9</td>
<td>Concrete Paver blocks</td>
<td>Basant, Nitco, Euro.</td>
</tr>
<tr>
<td>10</td>
<td>Teakwood and Salwood</td>
<td>Best quality, well seasoned, free from sap, Knots, cracks and as per approved sample.</td>
</tr>
<tr>
<td>11</td>
<td>Melamine polish, Paints, Polish and Varnish</td>
<td>ICI, Asian, Berger, Jenson &amp; Nicholson,Nerolac</td>
</tr>
<tr>
<td>12</td>
<td>Water proofing cement paint</td>
<td>Snowcem, Shellcem, Asian, Nerolac</td>
</tr>
<tr>
<td>13</td>
<td>Flushdoors</td>
<td>Kutty, Diamond doors, Archid or equivalent</td>
</tr>
<tr>
<td>14</td>
<td>Lamination sheets</td>
<td>Formica, Marino, Greenlam, Decolam.</td>
</tr>
<tr>
<td>15</td>
<td>PVC doors</td>
<td>Sintex or equivalent.</td>
</tr>
<tr>
<td>16</td>
<td>F.R.P Composite doors</td>
<td>Suraksha or equivalent.</td>
</tr>
<tr>
<td>17</td>
<td>Aluminium sections</td>
<td>Jindal / Indal / Bhoruka/ Nalco/Hindalco.</td>
</tr>
<tr>
<td>18</td>
<td>Mirror</td>
<td>Konica, Gujarat Guardian, Indo-Asahi, Modi-Guard</td>
</tr>
<tr>
<td>19</td>
<td>Glass</td>
<td>St.Gobain, Asahi, Modi</td>
</tr>
<tr>
<td>20</td>
<td>Locks</td>
<td>Godrej, Dorset, Golden, Armour</td>
</tr>
<tr>
<td>21</td>
<td>Adhesives</td>
<td>Fevicol, Vamicol</td>
</tr>
<tr>
<td>22</td>
<td>Vitreous sanitaryware</td>
<td>H-vitreous(Hindustan), Parryware, Cerra, Neycer</td>
</tr>
<tr>
<td>23</td>
<td>PVC pipes / Fittings</td>
<td>Prince, Finolex, Supreme, Prakash Surya</td>
</tr>
<tr>
<td>24</td>
<td>GI Pipes</td>
<td>Tata, Jindal, Appolo, Zenith,Indian tube company with ISI mark</td>
</tr>
<tr>
<td>25</td>
<td>GI Specials</td>
<td>‘R’brand, Jindal, Tata, Apollo</td>
</tr>
<tr>
<td>26</td>
<td>CP bottle traps, waste fittings, shower rose etc.,</td>
<td>Jaquar, Marco, Chilly</td>
</tr>
<tr>
<td>27</td>
<td>Bibcocks, Pillar cocks etc.,</td>
<td>Jaquar, Marco</td>
</tr>
<tr>
<td>28</td>
<td>Gatevalves, stopcocks etc.,</td>
<td>Leader, Neta, SSf, Commander</td>
</tr>
<tr>
<td>29</td>
<td>Stainless sink</td>
<td>AMC, Diamond, Nirali.</td>
</tr>
<tr>
<td>30</td>
<td>CI pipes and fittings</td>
<td>Neco, BIC</td>
</tr>
<tr>
<td>31</td>
<td>Stoneware pipes</td>
<td>TSL, Feroke, Dalmia</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Make/Equivalent</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------</td>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>32</td>
<td>PVC Water Tanks</td>
<td>Sintex or equivalents</td>
</tr>
<tr>
<td>33</td>
<td>Hume pipes</td>
<td>Indian hume pipes co / equivalent with ISI mark</td>
</tr>
<tr>
<td>34</td>
<td>Electric pumps</td>
<td>KSB/ Kirloskar/ Crompton or equivalent</td>
</tr>
<tr>
<td>35</td>
<td>Floor spring</td>
<td>Everite/Garnish/Efficient Gadgets, Hardwyn.</td>
</tr>
<tr>
<td>36</td>
<td>Door closure</td>
<td>Everite/Garnish/Efficient Gadgets/Opel</td>
</tr>
<tr>
<td>37</td>
<td>Poly Carbonate sheet</td>
<td>GE plastics or equivalents</td>
</tr>
<tr>
<td>38</td>
<td>Sealant</td>
<td>G.I or equivalent</td>
</tr>
<tr>
<td>39</td>
<td>Rolling shutter, Sliding grill doors</td>
<td>Swastik, Hercules or approved equivalent</td>
</tr>
<tr>
<td>40</td>
<td>Water proofing work</td>
<td>India Water Proofing, Overseas Waterproofing or approved equivalent</td>
</tr>
<tr>
<td>41</td>
<td>Antitermite treatment</td>
<td>Pest Control India or approved equivalent</td>
</tr>
</tbody>
</table>

**Note:** Contractors shall supply and provide make of materials only as specified above. In case the specified make are not available in the market the contractors shall use equivalent make of materials only with approval from clients.

An approved make has to satisfy the specifications and there can be no plea that when the specified make is used the work has to be accepted irrespective of the fact that the material used does not satisfy the specification.
### 15. TECHNICAL SPECIFICATIONS AND STANDARDS OF BUILDING (PEB)

#### Section 1: Building Description

Type of building: Tapered Column Multi Span Building

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type</td>
<td>Multi Span</td>
</tr>
<tr>
<td>2</td>
<td>Width (m)</td>
<td>As per requirement</td>
</tr>
<tr>
<td>3</td>
<td>Length (m)</td>
<td>As per requirement</td>
</tr>
<tr>
<td>4</td>
<td>Clear Height (m)</td>
<td>As per requirement</td>
</tr>
<tr>
<td>5</td>
<td>Bay spacing (m)</td>
<td>As per requirement</td>
</tr>
<tr>
<td>6</td>
<td>Roof Slope</td>
<td>1:10</td>
</tr>
<tr>
<td>7</td>
<td>Width Module (m)</td>
<td>As per requirement</td>
</tr>
<tr>
<td>8</td>
<td>Type of End Frames</td>
<td>Both Ends: Ridge frames</td>
</tr>
<tr>
<td>9</td>
<td>Bracing type</td>
<td>Diagonal</td>
</tr>
<tr>
<td>10</td>
<td>Roof sheeting</td>
<td>0.47 TCT bare Galvalume Hi-rib roofs with self drilling fasteners. Material shall be AZ150gsm/550 Mpa steel conforming to AS standard.</td>
</tr>
<tr>
<td>11</td>
<td>Wall Cladding</td>
<td>0.50 mm TCT Standard SMP Coated Galvalume sheets AZ150gsm/550 Mpa structural grad of steel (55%aluminium + 45% zinc coating) conforms to AS standard and fixed with self drilling fasteners. Sheeted both sides of the building above brick wall height 3.0 mtr from FFL.</td>
</tr>
<tr>
<td>12</td>
<td>Gable ends</td>
<td>Sheeted both sides of the building above brick wall height 3.0 mtr from FFL.</td>
</tr>
<tr>
<td>13</td>
<td>Brick Wall</td>
<td>Sheeted both sides of the building above brick wall height 3.0 mtr from FFL.</td>
</tr>
<tr>
<td>14</td>
<td>Canopy</td>
<td>4 Nos. Canopy on opening with 7.00 mtr x 2 mtr</td>
</tr>
<tr>
<td>15</td>
<td>Frame Opening</td>
<td>4 Nos. frame openings 4 mtr wide x 4 mtr ht.</td>
</tr>
<tr>
<td>16</td>
<td>Gutter and Down takes</td>
<td>Eave gutter and down spouts Metal.</td>
</tr>
<tr>
<td>17</td>
<td>Day light panel on roof</td>
<td>2mm Thick of FRP sheet 4% on roof.</td>
</tr>
<tr>
<td>18</td>
<td>Primer and Painting</td>
<td>All material i.e. column &amp; rafter duly shot blasted to SA 2.5 than Red oxide primer 35 to 55 micron and 2 coats of synthetic paints shall be applied on structure. One coat of paint shall be done in factory and one at site at the time of erection.</td>
</tr>
<tr>
<td>19</td>
<td>Accessories</td>
<td>All flashing &amp; corners considered.</td>
</tr>
<tr>
<td>20</td>
<td>Turbovent</td>
<td>24 inches dia, FRP hood, Aluminum body, steel bearing As per requirement</td>
</tr>
</tbody>
</table>
**Design Loads:** (Refer to Section 2 ‘Applicable Codes’).

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Design Dead Load (kg/m²) on roof</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Design Live Load (kg/m²) on frame</td>
<td>75</td>
</tr>
<tr>
<td>3</td>
<td>Wind Speed (kmph)</td>
<td>39 m/s</td>
</tr>
<tr>
<td>4</td>
<td>Collateral Load (kN/m²)</td>
<td>None</td>
</tr>
<tr>
<td>5</td>
<td>Snow Load (kN/m²)</td>
<td>None</td>
</tr>
<tr>
<td>6</td>
<td>Earthquake Zone</td>
<td>As per IS:1893-2002</td>
</tr>
</tbody>
</table>

**Deflection criteria:**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vertical</td>
<td>L/180</td>
</tr>
<tr>
<td>2</td>
<td>Lateral</td>
<td>EH/150</td>
</tr>
</tbody>
</table>

**Roof & Wall Sheeting**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Roof Panel</strong> 0.47 mm TCT Bare Galvalume Hi rib sheets.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Wall Panel</strong> 0.50 mm TCT SMP Coated Hi rib Profile Galvalume sheets.</td>
</tr>
</tbody>
</table>
Section 2: Applicable Codes

The building is to be designed in accordance with the following codes:

(i) Loads on the building are applied in accordance with: MBMA
(ii) Hot rolled sections and built up sections are designed in accordance with: AISC
(iii) Cold formed members are designed in accordance with: AISI
(iv) Welding is applied in accordance with:


(v) Wind Speed is calculated in accordance with:


(vi) Seismic Load is calculated in accordance with:

IS 1893 (Part 1): 2002 CRITERIA FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES
## Section 3: General Material Specifications

The following is the list of the standard material and specifications for which the building components have been designed:

<table>
<thead>
<tr>
<th>No.</th>
<th>Materials</th>
<th>Specifications</th>
<th>Minimum Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Built-Up Members (Primary and secondary)</td>
<td>ASTM A 572M Grade 345 Type 1 Hi-tensile steel</td>
<td>$F_y = 34.5 \text{kN/cm}^2$</td>
</tr>
<tr>
<td>2</td>
<td>Hot-Rolled Members</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Channels</td>
<td>IS 2062/ 1999 Grade B</td>
<td>$F_y = 24.5 \text{kN/cm}^2$</td>
</tr>
<tr>
<td></td>
<td>Pipes + Handrails</td>
<td>ASTM A 53M Type E or S Grade A Or IS: 2062</td>
<td>$F_y = 20.5 \text{kN/cm}^2$</td>
</tr>
<tr>
<td>3</td>
<td>Cold Formed Secondary Members (Purlins/Side girts)</td>
<td>Galvanised Steel</td>
<td>$F_y = 34.5 \text{kN/cm}^2$</td>
</tr>
<tr>
<td>4</td>
<td>Sheeting &amp; Liner Panels</td>
<td>ASTM A 792M Grade 550, AZ/150</td>
<td>$F_y = 55.0 \text{kN/cm}^2$</td>
</tr>
<tr>
<td>5</td>
<td>X-Bracing Members</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rod bracing</td>
<td>Or IS :2062 Grade A Or DIN 933 ST52_3</td>
<td>$F_u = 40.0 \text{kN/cm}^2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Or ASTM A 36M (or) its Equivalent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Angle bracing</td>
<td>IS 2062/ 1999 Grade A or B</td>
<td>$F_u = 24.8 \text{kN/cm}^2$</td>
</tr>
<tr>
<td>6</td>
<td>Anchor Bolts</td>
<td>IS : 2062</td>
<td>$F_y = 25.0 \text{kN/cm}^2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$F_u = 40.0 \text{kN/cm}^2$</td>
</tr>
<tr>
<td>7</td>
<td>High Strength Bolts</td>
<td>ASTM A 325M Class 8.8 Type 1 (or) its Equivalent</td>
<td>$F_u = 83.0 \text{kN/cm}^2$</td>
</tr>
<tr>
<td>8</td>
<td>Machine/foundation Bolts</td>
<td>DIN 933 Class 4.6 / 4.8 (or) its Equivalent Electro Plated Yellow Chromate</td>
<td>$F_u = 40.0 \text{kN/cm}^2$</td>
</tr>
</tbody>
</table>

$F_y = \text{Yield Strength, } F_u = \text{Ultimate Tensile Strength}$
Section 4: Steel Work Finish

1.1 Primary Steel

All primary steel members will be cleaned and painted at factory with one coat of Red Oxide primer of 35 microns DFT.

1.2 Secondary Steel

Roof Purlins, wall grits and eave struts shall be cold formed sections from cold rolled steel coils.

All other secondary steel members (Wind columns, Base angles, Angle, Clips, Brace Rod, Gable angles, Flange stays and other small misc. items) will be cleaned and painted at factory with one coat of primer of 35 microns DFT.

Section 5: Erection works

(a) Unloading of all supplied materials at job site from containers/trailers immediately upon the arrival of goods at site. Cleaning the empty container (if applicable) and sending it back.

(b) Storing of all steel supplied material at job site.

(c) Supply of skilled manpower.

(d) Supply of tools and equipment for the erection works.

(e) Erection of primary, secondary steel framing.

(f) Touch-up of paint due to erection damage.

(g) Cleaning-up of site on work completion.
16. ELECTRICAL SPECIFICATIONS

16.1 GENERAL

16.1.1 INTERPRETATION OF WORK AND INDIAN STANDARD

In the interpretation of specifications or items which are incomplete or where there are discrepancies or conflicts or may otherwise be subject to dispute, the following order of decreasing importance shall prevail:

(a) Items as detailed in “Good for Construction” drawings.
(b) Description of items in the schedule.
(c) Special Specifications and Annexures (if any) attached to the Tender.
(d) C.P.W.D specification for electrical works amended up to date.
(e) Indian standards specifications.
(f) Anything not covered by the above shall be as per I.E. Rules and Regulations.

16.2 SCOPE OF WORK

The general character and scope of work to be carried out under this contract is illustrated in the schedule of quantities and drawings. Contractor shall carry out and complete the said work under this contract in every respect and to the satisfaction of the Architects / Engineer-in-charge. In general the work to be carried out shall comprise:-

(a) Complete installation of all internal electrification for light points, light Plugs, power plugs, all types of utility outlets, call-bell points, ceiling/ exhaust fans, etc.
(b) Supply and installation of circuit wiring, submains & mains cables.
(c) Supply and installation of all distribution boards and sub distribution boards.
(d) Supply and installation of complete conduiting and wiring for communication and data systems.
(e) Supply and installation of complete earthing system.
(f) Supply and installation of all fans and installation of all types of lighting fixtures including those supplied by the client.
(g) Supply and installation of all external cabling, lighting fixtures, poles and feeder pillars.

16.3 RELEVANT I.S. STANDARDS & CPWD SPECIFICATIONS

<table>
<thead>
<tr>
<th>16.3.1</th>
<th>PVC insulated (Heavy duty) electric cable for working Voltage up to and including 1100 V (revised)</th>
<th>I.S. 1554-976</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.3.2</td>
<td>PVC insulated cables (for voltages up to 1100v)</td>
<td>I.S. 694-1977</td>
</tr>
<tr>
<td>16.3.3</td>
<td>Rigid Steel conduits for electrical wiring (second revision)</td>
<td>I.S.1653-1972</td>
</tr>
</tbody>
</table>
16.3.4  Unplasticised Rigid PVC conduits  I.S. 9537 III-1983
16.3.5  Accessories for rigid steel conduits for electrical wiring  I.S. 3837-1976
16.3.6  Boxes for the enclosure of electrical accessories  I.S. 5133-1969
16.3.7  General requirement of Switch Gear  I.S. 13947 – 1993
16.3.8  Miniature Circuit Breaker  I.S. 8828 – 1993
16.3.9  Bus bar connection & connection  I.S. 5578 & I.S. 11353
16.3.10  Assemblies of Switchgear and Control Gear & Bus Trunking  I.S. 8623 Part I & II - 1993
16.3.11  3 pi plug & socket outlets  I.S. 1293-1967
16.3.12  Adhesive insulating tapes for electrical purposes  I.S. 2448-1968
16.3.13  General safety requirements for electrical lighting fitting  I.S. 347-1966
16.3.14  Electric ceiling fans and regulators  I.S. 2312-1967
16.3.15  Propeller type AC ventilating fan  I.S. 2312-1967
16.3.16  Code of practice for earthing  I.S. 3043-1983
16.3.17  Code of practice for safety of building (General electrical installation)  I.S. 1646-1961

CPWD SPECIFICATIONS


16.4  GENERAL CONDITIONS

16.4.1  The specification general applicable to this work shall be as per C.P.W.D. specifications for electrical works in India except as otherwise specified in the description of items given in the schedule of Quantities or in the General and Technical Specification. These specifications will override the C.P.W.D. Specifications. The requirements of these specifications will be fulfilled by the Contractor within the Tendered rates and without any extra charge. The item rates quoted will be deemed to have taken these specifications into account.

16.4.2  The electrical work will be carried out in accordance with the General Specifications 1972 with amendments up to date for electrical works in Central Government buildings while complying in all respects with the Requirements of the latest Indian Electricity Rules in force at the time of execution.

16.4.3  The electrical work shall be carried out simultaneously with the building work and will be continued till it is completed satisfactorily along with the completion of essential portions of building work.
16.4.4 If any minor alterations are found necessary, the contractor shall do the same within Tendered rates.

16.4.5 The work shall be carried out in the best workman like manner and any defect in the work or changes in the design etc., if pointed out shall be carried out by the contractor within the Tendered rates.

16.4.6 The contractor shall employ adequate labour to complete the work within the stipulated time and make his own arrangements for housing labour and storage of materials etc. A full time Electrical Supervisor/ Engineer shall be employed by the contractor who will remain at site of work to receive orders or any other instructions from the Architects/ Engineer-in-charge.

16.4.7 Any materials supplied by the Employers, if damaged in any way during cartage or execution of work or otherwise, shall be made good by the contractor at his own cost.

16.4.8 During the progress of work, completed portions of the buildings may be occupied and put to use by the owner but contractor will remain fully responsible for maintenance of the electrical installations till the entire work covered by this contract is satisfactorily completed by him and taken over by the Architects/ Engineer-in-charge.

16.4.9 The contractor shall obtain for himself, on his own responsibility and at his own expense, all the information which may be necessary for the purpose if tendering and for entering into a contract, and must inspect the site, examine and study the specifications, drawings and the design of the electrical installations, the building plans etc. If the drawings are supplied to the contractor for Tender purposes, the same must be returned in good condition with the Tender. The contractors shall also make local and independent inquiries, if required.

16.4.10 All Tender rates will include the cost of materials, erection, connections, labour, supervision, tools, plant, transport, all taxes, contingencies, breakage, wastage, sundries, scaffolding and maintenance of installation for one year i.e. they should be for an item complete in all respects.

16.4.11 The contractor, while executing the work, shall conform to the provision of Government Acts relating to the work and to the regulations and Bye laws of the local authorities, and of the company to whose system of supply the installation is proposed to be connected. The contractor shall give all notices, required by the Acts, Regulations or Bye-Laws. He will also undertake to provide test certificates and drawings as required and will make necessary arrangements to procure the electricity supply. The contractor shall also obtain all approvals for the items of work done under this contract from the appropriate authorities. All inspection fees or submission fees paid by the contractor will be reimbursed by the owner against valid official receipts. Contractor shall possess a valid electrical contractor’s license issued by the inspectorate of the local government.

16.4.12 Samples of materials and fabrication drawings will be submitted by the contractor according to the schedule specification. Any deviation from the schedule/specifications must have the written consent of the Architects/ Engineer-in-charge. No approval given by the Architect/ Engineer-in-charge to any samples or drawings submitted by the contractor shall in any way exonerate the contractor form his liability to carry out the work in accordance with the terms of contract.

16.5 DRAWINGS
16.5.1 Shop Drawings

The contractor will submit four sets of shop drawings for all panels and other fabricated items which must contain details of general arrangement drawings with dimensions, clearances, loading details, foundation details, HV and LV cable box details, etc. with required copies. Minimum three sets of test certificates shall also be furnished by the Tenderer. These drawings and other literature shall be submitted in advance for approval.

16.5.2 Completion Drawings

The contractor shall submit one complete set of original tracings and further two copies of final existing layout drawings to the Architect/Engineer-in-charge after completion of the work. No completion certificate will be issued until the completion drawings are submitted. The drawings will be prepared and submitted by the contractor without extra charge.

16.6 PROGRESS AND TIME OF COMPLETION:

16.6.1 The Work will commence immediately after the contractor receives instructions to proceed. The contractor will work in co-operation with the building contractor and other contractors and shall arrange to place his conduits in the masonry and concrete work as the building or other work proceeds. Any hold up of the building or other work because of delay in laying of conduits or otherwise, shall be the responsibility of the electrical contractor and will make him liable for damages if any, by the employers.

16.6.2 The contractor shall consult the Architect/Engineer-in-charge and draw up a time schedule on commencement of the work. This time schedule shall be strictly adhered to.

16.7 COMPLETION TESTS

On Completion of installations the following tests shall be carried out:-

(a) Insulation Resistance Test;
(b) Polarity Test of Switch;
(c) Earth Continuity Test.

16.8 MAINTENANCE

The completed installation inclusive of wiring, light fittings and fans (where supplied by the contractor) shall not be finally taken over and acceptance certificate issued to the contractor until the expiry of the defects liability period. During this period the contractor shall be liable for:-

(a) The replacement of any defects that may develop in goods of his own manufacture or supplied by him.
(b) The rectification of all the defects arising out of defective workmanship of the contractor.
(c) Bringing to the notice of the Architect/Engineer-in-charge any defects arising out of materials supplied by the owner. The owner shall provide replacement of such material. Until the installation is finally taken over, for maintaining the installation in entry to the premises, at his own risk and expense, for maintaining the installation in proper order. To facilitate maintenance the contractor should clearly indicate the detailed distribution diagram on every switchgear, distribution board, sub distribution board and main board.

16.9 POSITION OF LIGHTING, DISTRIBUTION BOARDS AND SWITCHGEARS

16.9.1 The recommended positions of the lighting points, control switches, distribution boards and switchgears as shown on the layout drawings will be generally adhered to.

16.9.2 Should there be any discrepancy or incomplete description, ambiguity or omission in the drawings and other documents, whether original or supplementary, forming the contract, completion or maintenance of the installation, the contractor shall immediately, on discovering the same, bring it to the attention of the Architect/Engineer-in-charge.

16.9.3 Prior to the installation of lighting, fan and plug points and the distribution boards, switches etc., final positions shall be ascertained by the contractor with the Architects/Engineer-in-charge.

16.9.4 The dimensions and other details of the electrical drawings shall be compared with the civil drawings at site before execution of the work.

16.9.5 Installation of Main switch board, SDB’s Mains, Distribution wiring to individual points:-

(a) Distribution Boards

The D.Bs shall be installed as per the direction of Engineer-in-Charge/Consultants.

(b) Installation of Switch Boards

These shall be installed at a height of 1.3 meters (4’ – 3”) and above the floor level or as per direction of Engineer-in-Charge/Consultants.

(c) Installation of Ceiling Fans

Unless otherwise specified all ceiling fans shall be hung not less than 2.75 m (9 ft) above floor.

(d) Installation of Fluorescent Light Fittings

Unless otherwise specified these should be suspended 2.60 m(8’ – 6”) above the floor or as per direction of Engineer-in-Charge/Consultant to the match interiors.

(e) Installation of Exhaust Fans
Exhaust Fans shall be fitted by means of rag bolts embedded or on suitable size block board (12 mm thick) in the wall/ window panels.

(f) Installation of Socket Outlets

1. No Socket outlet shall be provided in the bath room at the height less than 130 cms (4’–3”) from the floor.
2. No switches shall be provided inside the bath rooms, unless approved by the Engineer-in-Charge/ Consultants.
3. Socket outlet at locations other than bath rooms shall be either 25 cms (10”) or 130 cms (4’-3”) from the floor.

16.10 PAINTING AND MARKING

All exposed steel work not actually embedded in the building construction (viz., conduits, junction boxes, switch boards D.Bs, M.Bs etc.) will be painted with one coat of primer and two coats of synthetic enamel paint in shades decided by the Architect/Engineer-in-charge. The paint will match the shades of wall wherever instructed. This work will be done by the contractor without extra charges. All switchgears, MDBs, SDBs and final DBs etc. shall be properly painted, labeled and numbered as required by the Architects/ Engineer-in-charge.

16.11 COORDINATION WITH OTHER AGENCIES

The contractors shall coordinate with other agencies and ensure that following provisions are made:

(I) Cut outs for risers, trenches etc.
(II) Proper space for DBs and all switchboards.
(III) Recesses required for fitting in the slab/false ceiling.

16.12 TECHNICAL SPECIFICATIONS

16.12.1 STEEL CONDUITS

All Conduit pipe shall be screwed type, solid drawn, mild steel with 16 Gauge wall thickness for all sizes, welded, electric thread type class ‘B’ having perfectly circular tubing and light fitting joints. The conduit shall be protected by one coat of black enameled paint applied inside and outside in its manufactured form. Confirming to IS 9537 – Part II – 1981 or latest version no steel conduit less than 19mm in diameter shall be used. Bends shall be of 16 gauge wall thickness and as far as possible the conduit system shall be so laid out that it will avoid the use of tees, elbows and sharp bends.

16.12.2 GALVANISED STEEL CONDUITS (where required)

These shall be mild steel with 16 Gauge wall thickness for all sizes, welded, electric thread type class ‘B’ having perfectly circular tubing and light fitting joints. The conduit
shall be protected from rust by hot dip galvanizing in its’ manufactured form. No steel conduit less than 19mm in diameter shall be used. Bends shall be of 16 gauge wall thickness and as far as possible the conduit system shall be so laid out that it will avoid the use of tees, elbows and sharp bends.

16.12.3 CEILING OUTLET BOXES

Outlet boxes shall be of sufficient depth and made of Cast Iron with a surface finish of hot-dip galvanising and so installed as to maintain continuity throughout. These shall be so protected at the time of laying that no mortar finds its way inside during concrete filling or plastering. For each fluorescent fittings two outlet boxes shall be provided 300 mm off-centre for a 1200 mm fitting and 150 mm off-centre for 600 mm long fitting.

16.12.4 DRAW BOXES

M.S. draw boxes/junction boxes of ample dimensions shall be provided at convenient points on walls/ceiling to facilitate pulling of long funs of cables/ wires. They will be completely concealed and covered with hylam covers flush with plaster work. These boxes will be as few as possible. All The M.S. boxes used for housing switches, plugs, drawing of wires etc. shall have metal on all sides except in front.

16.12.5 MSWITCH BOXES

Hot dip galvanized M.S. boxes of required sizes shall be provided to house the speed regulators, switches and sockets

16.12.6 ERECTION

(a) Conduits shall be laid in perfect fashion as instructed duly saddled and fastened to the wall/ceiling in a neat and proper manner in accordance with approved drawings. If required to run in the wall or in the floor filling, the same must be carried out neatly and with proper workmanship so as to conceal the entire run of conduits and ceiling outlet boxes. Wherever necessary, chaises will be cut by the contractor to sufficient depth to allow full thickness of plaster over conduits. Width of the chaise will be made to accommodate the required number of conduits. The chaises will be filled with cement and mortar (1:3) and properly cured by watering. If a chase is cut in an already finished surface the contractor shall fill the chase and finish it to match existing finish within the Tendered rates.

(b) When the conduit is to be embedded in a concrete member it shall be adequately tied to the reinforcement to prevent displacement during casting. Conduits in chases or laid above the slab, shall be held by hooks spaced at a maximum of 1500mm centre to centre. When the conduit is laid above the slab the same shall be covered with cement concrete mixture 1:3:6 using 1/4” thick stone aggregate and coarse sand. Suitable expansion joints fittings shall be provided at all the points where the conduit crossed any expansion joint in the building.

(c) The conduit shall have ample sectional area to facilitate the drawing of contractor should refer to the table given below for the laying of wires:

<table>
<thead>
<tr>
<th>Nominal Cross Sectional Area of conductor</th>
<th>Conduit size (PVC/M.S.) in mm</th>
</tr>
</thead>
</table>

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### Conduit Capacities

<table>
<thead>
<tr>
<th>Sq.mm</th>
<th>Inches</th>
<th>19/20</th>
<th>25/25</th>
<th>32/32</th>
<th>38/40</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>3/.029</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.5</td>
<td>3/.036</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4.0</td>
<td>7/.029</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6.0</td>
<td>7/.036</td>
<td>-</td>
<td>4</td>
<td>7</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10.0</td>
<td>7/.044</td>
<td>-</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>16.0</td>
<td>7/.064</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>25.0</td>
<td>19/.044</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>35.0</td>
<td>19/.064</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

**Note:** The above shows the maximum capacities of conduits for a simultaneous drawing in of cables. The table applies to 1100 Volts grade PVC insulated copper/aluminium conductor cables.

(d) All boxes shall have ample space at the back and on the sides for accommodating wires and checknut entries. Those shall be completely concealed having edges flush with wall surface. Cover plate shall be fixed to these by means of brass machine screws. No timber shall be used for any support.

(e) The entire conduit systems including outlets and boxes shall be thoroughly cleaned after completion of erection and before drawing of cables.

#### Switches, Sockets and Regulators

All switches for lights, fans and plug points shall be piano type switches, unless specified otherwise. All switches, sockets and regulators shall be flushed with wall at the heights mentioned unless directed otherwise. The mounting shall be done on the prescribed grid plates using the correct accessories and tools specified by the manufacturer.

#### Cables

All cables shall be 1100V grade and shall have been manufactured in accordance with the latest I.S specification. The conductor of flexible cables shall be of copper.

#### Point Wiring

The point wiring shall be carried out in the under mentioned manner each of which conform to the given specifications:

(a) In concealed/surface system including providing and fixing of conduits, bends, junction boxes, checknuts, PVC bushes etc.

(b) Loop system will be adopted (only in the outlet boxes for neutral wire and in the switch box for live wires) throughout including supplying and drawing of required sizes of wire without damaging the same.

(c) Each circuit will have independent neutral wire and will be complete up to outlet box and switch box. The point will be complete with conduit including accessories and wires. Necessary junction boxes, outlet boxes and switch boxes, connectors or ceiling roses, switches, switch plates and flush plates including necessary earthing.
and connection etc. The installation generally will be carried out in conformity with the Indian Electricity Act and IS specification.

(d) Wiring for light, fan, convenience lug point (5A) etc. will be as above. The size of wire shall not be less than 1.5 sq. mm or as specified against each item.

(e) The light plug points shall be complete with 3pin 5 A plug socket and switch enclosed in a galvanized M.S. box with the controlling switch as required and the third pin shall be earthed as specified with copper earth wire.

(f) The fan point shall have a provision in the switch box for mounting Electronic or wound type or regulators, unless directed otherwise.

(g) Wiring for power plugs shall be as above. Each circuit shall have one or two plug points as required and each point shall be earthed with at least 2.5 sq. mm copper earth wire or as specified against each item. The point shall be considered complete with circuit, 3 pin 5/15 A plug socket and switch mounted in as MS box with flush plates. Wiring for power plugs shall be as described in Schedule of Quantities.

(h) Separate and independent conduits will be used for each of the following systems:

- Lighting system.
- Power system.
- Telephone system.
- Computer system.

In the case of conduits for Computer networks, a minimum clear parallel space of 125mm shall be maintained from any path of AC Conductors if the AC conductors are place in metallic conduits. If the AC conductors are not armoured, shielded or otherwise provided with a conductive sheath, the minimum parallel distance to be maintained shall be 300mm. The rate per point shall include all materials and labour required for completing the points as mentioned above. Measurements will be in numbers of each kind of point.

16.12.10 MAINS AND SUBMAINS

Mains and sub-mains shall consist of wires, cables and conduits, bends, junction boxes, rubber bushes, check-nuts etc. as specified before. The sizes and capacities of conduits and wires shall be as stated in the schedule of quantities and will commence from the main switches to the various distribution boards. Wires shall be drawn in concealed or surface conduits as required without being damaged. For this purpose draw boxes shall be located at convenient but not in conspicuous places. Every main and submain will run in an independent conduit. Necessary provisions of wire lengths entering and emerging from the conduit must be made for connections. Colour code for phase and neutral are to be followed i.e. only RED, YELLOW, BLUE and BLACK colour wires are to be used. Measurements will be taken of the actual conduit run containing the wires from one switchgear to another. Per metre rate shall include all materials, connections, labour etc. as specified above.

Two earth wires of proper rating shall be provided for each sub-main and every single phase sub-main. For each 3 phase sub-main, two earth wires of proper rating shall be provided along with sub-main. The earth wires shall be fixed to conduits by means of clips at not less than 1000 mm distance.

LOAD BALANCING
Balancing of circuits in three phase installation shall be planned before the commencement of wiring and shall be strictly adhered to.

16.13 CABLE WORK

16.13.1 STORAGE AND HANDLING

Cable drums shall be stored on a well drained, hard surface, preferable concrete, so that the drums do not sink into the ground causing rot and damage to the cable drum.

During storage, periodical rolling of drums once in 3 months through 90 degree shall be done specially in the case of paper insulated cables. Rolling shall be done in the direction of the arrow marked on the drum. It should be ensured that both ends of the cables are properly sealed to prevent ingress/absorption of moisture by the cable drums, should be ensured during storage. The drums shall always be rested on flanges and not on flat sides. While removing cables the drums shall be properly mounted on jacks or on a cable wheel or any other suitable means making sure the spindle, jack, etc. is strong enough to take the weight of the drum. The cables shall not be sharply bent within a small radius.

The minimum safe bending radius for all types of PVC cables shall be taken as 12 times the overall diameter of the cable. Wherever practicable, large radius should be adopted. At joints and termination’s, the bending radius of individual cores of mulletcore cable shall not be less than 15 times its overall diameter. Cables with kinks and straightened kinks or with similar apparent defects like defective armouring etc. shall not be installed.

16.13.2 INSTALLATION

The cables installation including necessary joints shall be carried out in accordance with the specifications given herein. For details not covered in the specification, IS 1255-1967 shall be followed. Before the cable laying is undertaken, the route of the cable should be preferred, cable runs shall generally follow fixed developments such as roads, foot paths etc. Cables of different voltages and also power and control cables should be kept in different trenches with adequate separation. Where available space is restricted, LV/MV cables shall be laid above HV cables. Where cables cross one another, the cable of higher voltage shall be laid at a lower level than the cable of lower voltage.

16.13.3 LAYING DIRECT IN GROUND

(a) Width of Trench

The width of the trench shall be first determined on the following basis:

(a) The minimum of the trench for laying single cable shall be 35 cm.
(b) Where more than one cable is to be laid in the same trench in horizontal formation, the width of trench shall be increased such that the inter-axial
spacing between the cables, except where otherwise specified, shall be at least 200 mm.
(c) There shall be a clearance of at least 150 mm between axis of the end cables and the sides of the trench.

(b) **Depth of Trench**

The depth of trench shall be determined on the following basis:

(a) Where cables are laid in single tier formations, the total depth of trench shall not be less than 750mm for cables up to 1.1 KV and 1200 mm for cables above 1.1 KV.
(b) When more than one tier of cables is unavoidable and vertical formation of laying is adopted, depth of trench in (ib) above shall be increased by 15 cm for each additional tier to be formed.

(c) **Excavation of Trenches**

The trenches shall be excavated in reasonably straight lines. Wherever there is a change in direction suitable curvature shall be provided. Where gradients and changes in depth are unavoidable, these shall be gradual. Excavation should be done by any suitable means – manual or mechanical. The excavated soil shall be stacked firmly by the side of trench such that it may not fall back into the trench. Existing property exposed during trenching shall be temporarily supported or propped adequately as directed by the engineer-in-charge. The trenching in such cases shall be done in short lengths, necessary pipe laid for passing cables therein and the trench refilled.

If there is any danger of a trench collapsing or endangering adjacent structures, the sides should be well stored up with timbering and/or sheeting as the excavation proceeds. Where necessary, these may even be left in places when back filling the trench. The bottom of the trench shall be level and free from stone, bricks etc. The trench shall then be provided with layer of clean, dry sand cushion of not less than 100mm in depth.

16.13.4 **LAYING OF CABLE IN TRENCH**

The cable drum shall be properly mounted on jacks or on cable wheel at a suitable location, making sure that the spindle, jack etc. are strong enough to carry the weight of the drum without damage & that spindle is horizontal in the bearings so as to prevent the drum creeping to one side while rotating.

The cable shall be pulled over rollers in the trench steadily and uniformly without jerks and strains. The entire cable length shall be as far as possible unrolled in one stretch. However where this is not possible the remainder of the cable may be removed by ‘Flaking’ i.e. by making one long loop in the reverse direction. For short runs and sizes up to 50 sq. mm of cables up to 1.1 KV grade, any other suitable method of direct handling and laying can be adopted with the prior approval of the engineer-in-charge. When the cable has been properly
straightened, the cores are tested for continuity and insulation resistance and the
cable is then measured. The ends of all PVC/ XLPE cables shall be sealed with
suitable moisture-proofing tape.

Cables laid in trenches in a single tier formation shall have a covering of clean, dry
sand of not less than 100mm above the base cushion of sand before protective
cover is laid.

In case of vertical multi-tier formation after the first cable has been laid a sand
cushion of 150 mm shall be provided over the initial bed before the second tier is
laid. If additional tiers are formed, each of the subsequent tiers also shall have a
sand cushion than 150 mm as stated above. The top most cable shall have a final
sand covering not less than 100mm before protective cover is laid. The depth of the
top most cable shall not be less than 750 mm.

At the time of original installation, approximately 3m of surplus cable shall be
provided on each side of the underground joints (straight/through tee/ termination)
and at entries and plates as may be decided by the Engineer-in-charge. The surplus
cable shall be left in the form of a loop. Where there are long runs of cable length,
loose cables may be left at suitable intervals as specified by the Engineer-in-
charge.

Unless otherwise specified, the cables shall be protected by second class bricks of
not less than 20 cm x 10cm x 10cm (normal size) as per CPWD building
specification or protection covers placed on top of the sand (bricks to be laid
breadthwise, on edge) for the full length of the cable to the satisfaction of the
engineer-in-charge. Where more than one cable is to be laid in the same trench,
this protective covering shall cover all the cables and project at least 5cm over the
side of the end cables.

16.13.5 BACK FILLING

The trenches shall then be back filled with excavated earth free from stones or
other sharp edged debris and shall be rammed and watered if necessary, in
successive layers not exceeding 30cm. Unless otherwise specified a crown of earth
not less than 50mm in the centre and tapering towards the sides of the trench shall
be left to allow for subsidence. The crown of earth however should not exceed
10cms so as to be hazard to vehicular traffic. The temporary reinstatement of
roadways should be inspected at regular intervals, particularly during the wet
weather and any settlement should be made good by further fillings as may be
required. After the subsidence has ceased, trenches cut through roadways of other
paved areas shall be restored to the same density and materials as the surrounding
area and repaired in accordance with the relevant CPWD building specifications to
the satisfaction of the engineer-in-charge.

Where roads or lawns have been cut or curb stones displaced, the same shall be
repaired and made good in all respects (except turning/ asphalting) to the
satisfaction of the engineer-in-charge and all surplus earth or rock removed to
designated garbage/ debris areas at site.
16.13.6 ROUTE MARKERS

Route markers shall be provided along straight runs of the cables at locations approved by the engineer-in-charge and generally at intervals not exceeding 100m. Markers shall also be provided to identify the change in direction of the cable routes and also for location of every underground joint.

16.13.7 LAYING IN PIPES/ CLOSED DUCTS

At locations such as road crossings, entry to buildings, for poles in paved area, etc. cables shall be laid in pipes or closed ducts. Stoneware pipes, G.I, C.I, spun reinforced concrete pipes or flexible double walled corrugated HDPE pipes shall be used for such purposes. Pipes shall be continuous and clear of debris or concrete before a cable is drawn. Sharp edges at ends shall be smoothened to prevent any injury to cable insulation or sheathing.

Pipes for cable entries to the building shall slope downwards from the building and shall be suitably sealed to prevent entry of water inside the building. Further the mouth of the pipes at the building end shall be suitably sealed to avoid entry of water. Cable grips/ draw wires and winches etc. may be employed for drawing cables through pipes/ closed ducts etc.

16.13.8 LAYING ON SURFACE

The cables may be laid through in trough or brackets at regular intervals or directly cleated to wall/ ceiling. When laid over bracket supports the cables shall be clamped to prevent undue sag. Cable clamps shall be made from materials such as mild steel, aluminium etc. In case of single core cables the clamps shall be of non-magnetic materials. A suitable non-corrosive packaging shall be used for clamping unarmoured cables to prevent damage to the cable sheath.

Wherever more than one cable is laid/ run side by side, marker tags as approved inscribed with cable identification details shall be permanently attached to all the cables in the manholes/ pull pits/ joint pits/ entry points in buildings/ open ducts etc. These shall be attached to various cables laid direct in ground at suitable intervals as decided by the Engineer-in-charge before the trenches are filled up.

Jointing work shall be carried out only by licensed/ experienced cable jointer. Sufficient ventilation shall be provided during jointing operation in order to disperse fumes given out by fluxing. Jointing materials and accessories like conductor furrules, solder flux and protective tapes, filling compound, jointing boxes etc. of right quality and correct sizes conforming to relevant Indian Standards, wherever they exist shall be used.

The design of the joint box and the composition of the filling compound shall be such as to provide an effective sealing against entry of moisture in addition to affording proper electrical characteristic to joints. Where special type of splicing connector kits or epoxy resin spliced joints are specified, materials approved for
such application shall be used and instruction of the manufacturer/supplier of such materials shall be strictly followed.

Insulation resistance of cables to be jointed shall be measured with 500 V megger up to 1.1 KV grade and with 2500/5000 V megger for cables of higher voltage. Unless the insulation resistance values are satisfactory, jointing shall not be done. Whenever Aluminium conductor is exposed to outside atmosphere a highly tenacious oxide film is formed which makes soldering of aluminium conductor difficult. This oxide film should be removed using appropriate type of flux. The clamps for the armoured shall be clean and tight.

16.14 DISTRIBUTION BOARDS

The Distribution boards shall be in accordance with IS 2147 – 1952 and 2675 – 1966 comprising of set of insulated, tiered 200A rating copper bus bars, earth terminals, MCB’s, DP RCCB’s and neutral link mounted in three tiers phase wise as detailed in the schedule of quantities. Power Distribution Boards (400 volts TPN) shall be constructed form 16 SWG sheet steel and Branch Distribution Boards (230 volts SPN from 18 SWG sheet steel). These shall be housed in a hinged double door sheet metal box of adequate dimensions made by the approved MCB manufacturer and according to the IP classification mentioned in the Schedule of Quantities. Suitable locking arrangements shall be made if required. All distribution boards shall be fitted with MCBs connected on the live sides. The bus bar shall be such that the circuit could be isolated easily. The rating and breaking capacity of the MCBs shall be as detailed in the schedule of quantities. All the distribution boards shall be painted with approved paint. Each circuit shall have an independent neutral in-charge. Sample of the complete distribution board shall be approved before installing. The rate per item will include all the above mentioned material and labour required. Measurements will be in numbers of complete sets as described in the schedule of quantities.

All three phase power distribution boards shall be properly earthed with two number 10 SWG galvanized iron wires and provided with suitable Danger Board. All SPN B.D.B’s shall be properly earthed with one number 10 SWG galvanized iron wire each.

16.15 SWITCHBOARDS SHEET STEEL CUBICLE PATTERN

16.15.1 CONSTRUCTION

Switch boards shall be cubicle, indoor, floor/ wall mounting, free standing type fabricated from CRCA sheet. They shall be rated for 415/500 Volts 3 phase 4 wire 50Hzsystem and have insulation voltage of at least 2500 Volts for 60 Seconds. Panels shall be fabricated using minimum 2mm thick CRCA sheet that has been pre-treated by degreasing, pickling, phosphating and passivation.

Gaskets shall be used between all adjacent units and beneath all covers to render the joints effectively dust proof. The design shall be totally enclosed, completely dust and vermin proof conforming to IP 42 class of construction. All modules shall have a covering at the bottom so that entry to dust, rats and vermin is not possible.
The switchboards shall be easily extendible. The arrangement shall be logical, compact and neat. The switchboard shall have a uniform height throughout its length.

A base channel of 50mm x 25mm fabricated out of 3mm thick hot rolled sheet steel painted black shall be provided to prevent corrosion of the sheet steel cubicle and facilitate cleaning of floors.

16.15.2 FEEDER ARRANGEMENTS

Unless specifically stated, the switchboard shall be of single front construction, i.e. it should have all operations and connection from the front of the panel, an equipment shall be mounted on the front only. The rating of switches, fuses, connectors etc. shall be as specified. If specified rating is not available, next higher rating should be used in consultation with the Architect/ Consultant. Outgoing feeders shall be neatly arranged in different compartments. Normally equipment for individual feeders shall be accommodated in separate modules. The framework shall house the switches, switch fuse units, starters and connectors. MCBs and MCCBs etc. in multi-tier formation. The equipment shall be mounted independent of the backplate and not on the rear surface of the housing. Each module shall be fitted with individual doors and concealed hinges. All doors shall be held securely against sponge rubber gaskets to make the equipment dust tight. All hinged doors shall be provided with insulated half-turn, flush mounted, steel knobs. The compartment doors shall be so interlocked that it shall not be possible to open the door when the switch is in closed (ON) position.

16.15.3 BUS BARS

Copper bus bars are to be used for current ratings up to 400A and for ratings above 400A, electrolytic grade aluminium bus bars may be used. The rating of the three phase (and neutral) bus bars shall be as specified in the schedule of quantities and drawings and shall not be less than the total incoming switches current rating. They shall be housed in separate bus bar chambers, rated for a temperature rise of 30° C over the ambient temperature specified based on insulated conductor rating (I.S: 8084-1976). Neutral bars may be of one half the size of phase bars. An earth bus of size approximately 50% of the phase bus bar shall be provided and shall be carried to some point external to the panel.

Bus bars shall be supported on unbreakable non-hygroscopic SMC/ DMC moulded supports with anti-tracking barriers rigidly held to the framework of the chamber. The bus bars shall be suitably insulated with colour coded heat shrinkable PVC sleeves. Bus bar chamber shall have a separate screwed cover with clear markings to identify the voltage and current rating of the bus bars.

16.15.4 CABLE COMPARTMENT

A cable compartment running along the vertical module shall be provided for easy termination of all incoming and outgoing cables entering from top or bottom. Adequate supports shall be provided for the cables where necessary. The cable
compartment shall have its own screwed removable gland plate cover, preferably at top and bottom, for easy access during cabling.

16.15.5 CONTROL WIRING

All control wiring shall be carried out through the common vertical compartment. In case wires are required to cross the busbar chamber, such crossings shall be carried out in neat bunches tied together. Power connections of the feeders shall be done by aluminium or copper flats of adequate sizes.

Control wiring shall be done using PVC insulated multi-stranded copper wires of minimum 1.5sq.mm nominal cross sectional area. All control wiring shall be fitted with identification ferrules at each end. Not more than two connections shall be made at any one terminal. The wires shall be arranged and supported in such a manner that there shall be no strain on the terminations. The terminations shall be of adequate current rating and size to suit individual feeder arrangements.

Power terminals shall be pressure clamp type suitable for copper/ aluminium wires. For connection above 63A, 35sq.mm cable lugs shall be used. These cable lugs shall be mounted in such a manner as to facilitate cable connections.

16.15.6 CABLE ENTRY

Cubicles shall be designed to facilitate steel strip armoured, PVC sheathed copper or aluminium conductor cable entry from top or bottom as the case may be. Removable sheet steel plates shall be firred at the top and bottom to punch holes for cable entry at site.

16.15.7 PAINTING

All steel work shall be painted in pre-approved shade as required after proper mechanical and chemical cleaning by degreasing, pickling, phosphating and passivation has been done. Painting should preferably be carried out using powder coating technique.

16.16 SPECIFICATIONS FOR MEDIUM VOLTAGE EQUIPMENT

16.16.1 Air Circuit Breakers (A.C.B.)

Air Circuit Breakers shall be horizontal draw out type fully interlocked and meeting the requirements of IS:2516. Breakers shall be rated for medium voltage of 600V and rated full load current as indicated on drawings. Breakers shall be capable of breaking system short circuits specified and earth faults where required and be provided with facilities for electrical and/or mechanical interlocking.

Breakers shall be, unless specified otherwise, spring-charged, motor operated, complete with facility for manual spring charging and manual closing arrangement, isolating plug and safety shutters, mechanical ON/OFF indicator, silver plated
arching and main contacts, arc chutes and trip free operation. Breakers shall be capable of being racked into “Service”, “Test” and “Isolated” positions and kept locked in any position with mechanical indication of position.

16.16.2 Switch Fuse Units

Switch Fuse units shall have quick-make, quick break contacts with double break operating mechanism suitable for rotary operation and door interlock facility in the case of cubicle mounting. Incoming and outgoing terminals shall be properly sized to receive corresponding size of copper or aluminium conductor cable. All switches shall be rated according to the equipment schedule or drawings and shall withstand the system prospective fault current. All Switch Fuse Units shall be heavy duty type conforming to Fuses shall be HRC cartridge type conforming to IS: 9224-1991 with a breaking capacity to system fault level. Fuses shall be link type with visible indication to show fuse status. Unless otherwise stated, SFUs shall be three pole and neutral.

16.16.3 Instrument Transformers, Meters & Relays

Analog Ammeters and Voltmeters shall have moving iron spring controlled dead beat elements in square bezel flush type cases 96mm in size and suitable for switch board mounting with external provision for zero adjustment. Meters shall conform to BS: 89 and have grade ‘A’ accuracy. Scale ranger shall meet with the requirements or as indicated on the drawings or in the schedule of quantities. Cassette type modular metering devices shall be provided where stipulated in the Schedule of Quantities.

In the case of digital metering, the installation shall comply with the following relevant standards: BIS, IS and CBIP. All such devices shall be CE and IEC complaint.

Energy meters shall be two element switch board mounting type suitable for unbalanced loads. Meters should incorporate a KVA demand meter with an integration time of 30 minutes. In case of two incoming feeders, a summating C.T. shall be provided with the meter. Meters shall conform to BIS:37. All tripping may be through combination of IDMT thermal and magnetic releases as specified.

16.17 Testing of Installation

Before the completed installation is put into service, the following tests shall be carried out by the contractor in presence of the Engineer-in Charge/ Consultants.

(a) Polarity of Switches

It must be ensured by test that all single pole switches have been fitted on the live side of the circuits they control.

(b) Insulation Test

I. By applying a 500 volt megger between earth and the whole system of conductors or any section thereof, with all fuses in place and all switches closed, all lamps not in position, fans not connected or both poles of
installation otherwise electrically connected together:- The result in meghom shall not be less than 50 divided by the number of points on the circuit, and should not be less than 1 meghom.

II. Between all conductors connected to one phase and all such conductors connected to the neutral or to the other phase conductors of the supply after removing all metallic connections between the two poles of the installation and switching on all switches. The insulation resistance shall be as in (i) above.

(c) Earth Continuity Test

The earth continuity conductor including metal conduits, and metal sheaths of cables in all cases shall be tested for electrical continuity. Electrical resistance of the above along with the earthing lead but excluding any resistance of earth leakage circuit breaker, measured from the connection with completed installation shall not exceed one ohm.

16.18 EARTHING

Earthing shall conform to the following specifications. For other details not covered in this specification, relevant Indian standards shall be referred to.

TYPES OF EARTH ELECTRODES

(a) Pipe earth electrode.
(b) Plate earth electrode.

16.18.1 PIPE EARTH ELECTRODE:

G.I pipe shall be of medium class, 40mm dia and 4.5m in length. Galvanising of the pipe shall conform to relevant Indian standards. G.I pipe electrodes shall be cut tapered at the bottom and provided with holes of 12mm dia drilled not less than 7.5 cm from each other up to 2m of length from the bottom. The electrode shall be buried in the ground vertically with its top not less than 20 cm below ground level.

16.18.2 PLATE EARTH ELECTRODE

For plate electrode minimum dimensions of the electrodes shall be as under:

1. GI plate electrode- 60 cm x 60 cm x 6 mm thick.
2. Copper plate electrode- 60 cm x 60 cm x m 33 thick.

The electrode shall be buried in the ground with its faces vertical and the top not less than 3 m below ground level.

16.18.3 METHOD OF INSTALLING WATERING ARRANGEMENT
In the case of plate electrode, a watering pipe of 20 mm dia of medium class G.I pipe shall be provided and attached to the electrode. A funnel with mesh shall be provided on the top of this pipe for watering the earth. In case of pipe electrode a 40m x 20mm reducer shall be used for fixing the funnel. The watering funnel attachment shall be housed in a masonry enclosure of not less than 30cm x 30 cm x 30 cm. A cast iron/ M.S frame with cover and locking arrangement shall be suitably embedded in the masonry enclosure.

16.18.4 LOCATION OF EARTH ELECTRODE

Normally an earth electrode shall not be situated less than 1.5m from any building. Care shall be taken that the excavations for earth electrode shall not effect the column footings or foundations of the building. In such cases the electrodes shall be situated farther away from the building.

The location of the earth electrode shall be where the soil has reasonable chance of remaining moist, as far as possible. Entrances, pavements and roadways, are definitely to be avoided for locating the earth electrode.

16.18.5 METHOD OF CONNECTING EARTHING LEAD TO EARTH ELECTRODE

In the case of plate earth electrode the earthing lead shall be securely bolted to the plate with two bolts, nuts, checknuts and washers. In the case of pipe earth electrode, it shall be connected by means of a through bolt, nuts, washers and cable socket.

All materials used for connecting the earth lead with electrode shall be G.I in case of G.I pipe or G.I plate earth electrode and of tinned brass in case of copper plate electrode.

The earthing lead shall be securely connected at the other end to the main board. Loop earthing shall be provided for all mountings of main board and other metal clad switches and distribution fuse boards with not less than 14 SWG copper or 12 SWG G.I or 4 sq.mm. Aluminium wire.

The earthing lead from electrode onwards shall be suitably protected from mechanical damage by a 15 mm dia G.I pipe in case of wire and by 40 mm dia medium G.I pipe in case of strip. Portions of this protection pipe within ground shall be buried at least 30 cm deep (to be increased to 50 cm in case of road crossing and pavement). The portion within the building shall be recessed in walls and floors to adequate depth.

In all cases the relevant provisions of rules 33, 61 and 67 of Indian Electricity rules 1956 as amended shall be complied with. Metallic covers or supports of all medium pressure or H.T. apparatus or conductors shall in all cases be connected to not less than tow separate and distinct earth electrodes. No earth electrode shall have a greated ohm resistance than five ohms as measured by an approved earth testing apparatus. In rocky soil the resistance may be up to eight ohms.
16.18.6 EARTH RESISTANCE TEST

To ensure effectiveness of installation earth, the value of earth resistance of the earth Electrode shall not be more than five ohms as measured by an approved earth testing apparatus and in rocky soil the resistance may be upto eight ohms.
17 TECHNICAL SPECIFICATION FOR 33 or 22 or 11 kv ELECTRICAL SUB STATION

17.0 The design and setting up electrical substation shall be as per norms and standards prescribed by Power supplying authority. The capacity of Electrical substation shall be 630 KVA.

17.1 **Fencing for Substation** shall be provided to cover a length of 12 m & breadth of 8 m by

(a) Erecting MS Channel pole of size 100 x 50 x 4 mm with MS base plate of 200 x 200 x 5 mm thick for fencing at a spacing of 2 m support duly grouting in cement concrete
(b) Fixing of fencing by GI Chain link 100 x 100 mm / (3.8 mm).
(c) Fixing of Cross supporting chain link for fencing using MS Flat of size 25 x 6 mm

17.2 **Grill Gate for Substation** shall be fabricated to a size of 1.2 m breadth x 1.5 m height using MS Channel/ Flat/ bar etc. of suitable size. It shall be painted with two coats of primer zinc chromate and finished with one coat of black/ white paint including fixing of gate using hinges duly marking holes accordingly.

17.3 **630 KVA outdoor type package substation with oil immersed hermetically sealed transformer & APFC Panel**

Outdoor type package substation shall be with facility for internal lighting, earthing, padlocks etc. Connection to transformer will be by means of suitable capper cables/ Busbar and connections from transformer to LT ACB will be by busbar connections and cable termination kits should be a part of the scope of supply (within enclosure). There should be sufficient ventilation and door openings. The enclosure shall be divided into three compartments for the HV/MV voltage switch gear, low voltage switch gear and distribution transformer. The wall and roof modules are to be constructed from at least 1.5 mm galvanized sheet steel, painted with two coats of PU paint, assembled by means of a self locking mechanism. The foundation and base frame are to be of 2 mm GI sheet. The package substation should be designed and type tested in accordance with IEC 61330.

The unitised substation shall be of Areva, Schneider, ABB, Crompton Greaves make.

A) **HT Switchgear**

**2 Way Non Extensible Single Unit Compact switchgear** consisting of

- Direct cable switch : 1 No.
- Fixed manual 200 Amps Vaccum Circuit Breaker in SF6 insulated Stainless Steel tank enclosure : 1 No.
- Series trip, self powered micro processor based (IDMTL + Inst.) numerical over current relay and
Earth fault relay for circuit breakers : 1 Set

- Neon indicator for circuit breaker.
- Trip push button for T-off circuit breaker.
- Shunt trip coil rated for 230V AC.
- Padlocking facility.

With suitable arrangement for incoming cable and outgoing to primary of transformer through 1 C x 3 x 95 sqm. aluminium armoured XLPE cable.

B) Transformer

630 KVA, 33 or 22 or 11 KV / 433 V three phase, DYn11, AN Type oil immersed hermetically sealed type transformer with Copper winding and off- circuit tap changer (+)5% to –(5%) at 2.5% on HT side of transformer & other standard fittings.

3 phase 50 Hz 630 KVA DYn11, core type double wound with copper conductor oil immersed ONAN cooled distribution transformer with corrugated tank having no load voltage ratio of 11KV/433V. Tappings (-)5% to (+) 5% in steps of 2.5% shall be provided at line end of HV winding. Changing of taps shall be carried out by means of OFF Load Tap Changer. Oil temperature indicator and other statutory accessories are to be supplied along with the transformer. Temperature rise shall be 35/45°C in oil/winding respectively over a maximum ambient of 50°C. The transformer shall be manufactured as per latest IS: 2026.

C) On LV side

Incomer: - 1 No. 433V, 4pole, 1000A, 50 KA electrically operated fixed type ACB with microprocessor release with PVC sleeved Aluminum bus bars.

D) Automatic Power Factor Correction (APFC) equipment of capacity 200 KVAR (25 KVAR x 8 Nos.) shall be with capacitor units complying to IS: 13340/ IEC 831 for self healing type and other components such as Contactors, MCCB’s shall comply with the latest versions of relevant Indian Standards.

17.4 TYPE TESTS FOR THE PACKAGE SUBSTATION COMPLETELY ASSEMBLED

17.4.1 The Package Substation offered must have been type tested as per IEC 61330/62271-202. The following copy of type test report / summary should be submitted along with all relevant drawings before supply of materials:

17.4.2

a) Impulse withstand Test with breaker inside the cubicle.
b) Temperature rise test with breaker inside the cubicle.
c) Short circuit withstand test of breaker.
d) Dielectric tests
e) Internal ARC test on the CSS with RMU.
f) Temperature rise K-10 test with transformer in the CSS.
i) IP54 and IP23 test on the CSS enclosure.

17.4.3 **Routine Tests:** The routine tests shall be made on each complete prefabricated substation.
   A. Voltage tests on auxiliary circuit.
   B. Functional test.
   C. Verification of complete wiring.

17.4.4 **Test Witness:** Routine test shall be performed in presence of Owner’s representative if so desired by the Owner. The Contractor shall give at least fifteen (15) days advance notice of the date when the tests are to be carried out.

17.4.5 **Test Certificates:** Certified reports of all the tests carried out at the works shall be furnished in three (3) copies for approval of the Owner.

17.5 **Completion Drawings**

For all works covered in the contract drawings as erected shall be prepared and one soft copy on CD & four hard copies in computer printout (in A3 or A4 size paper) duly indicating all the relevant details of work done shall be submitted to **IRCTC.**
TECHNICAL SPECIFICATION FOR SAFE EARTHING

ARRANGEMENT

Safe Earthing Electrode developed by adopting pipe-in-pipe technology concept involving two mild steel pipes one inserted inside the other and both the pipes are subjected to Hot Dip Galvanization: 80 – 100 microns on the outer electrode and 250 – 300 microns inside the electrode. The empty space inside the electrodes is filled with a specially developed Crystalline Conductive Mixture (CCM), which are highly conductive and anti-corrosive.

Safe Earthing Electrode (SEE) is the product of unique blend of pipe in pipe technology manufactured form mild steel tubes and hot dip galvanized. The primary electrode is inserted in the secondary electrode. The space in-between the tubes is filled with high conductive non-corrosive compound (CCM) and the top and bottom ends are sealed with hot dipped galvanized caps, the total length of electrode is 3000 mm.

Backfill Compound

The Backfill Compound contains soil-friendly materials and it maintains moisture within the sphere of influence of electrode and enhances the surrounding oil conductivity making it more effective in improving the electrode performance the system in corrosive environment.

(i) Safe Earthing Electrode: Type ‘A’

Application: Transformer Neutral Earthing – 2 Nos.

Length : 3000 mm
Outer dia : 80 mm
Inner dia : 40 mm
Terminal Hole dia : 14 mm
Outer wall thick : 16 SWG (1.626 mm)
Inner wall thick : 12 SWG (2.641 mm)
Galvanisation : 80 -100 microns – outer electrode
Space inside filled with : Crystalline Conductive Mixture (CCM)

(ii) Safe Earthing Electrode: Type ‘B’

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>3000 mm</td>
</tr>
<tr>
<td>Outer dia</td>
<td>50 mm</td>
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<tr>
<td>Inner dia</td>
<td>25 mm</td>
</tr>
<tr>
<td>Terminal Hole dia</td>
<td>14 mm</td>
</tr>
<tr>
<td>Outer wall thick</td>
<td>18 SWG (1.219 mm)</td>
</tr>
<tr>
<td>Inner wall thick</td>
<td>12 SWG (2.641 mm)</td>
</tr>
<tr>
<td>Galvanisation</td>
<td>80 -100 microns – outer electrode</td>
</tr>
<tr>
<td>Space inside filled with</td>
<td>Crystalline Conductive Mixture (CCM)</td>
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## 19 APPROVED BRANDS & MAKES OF MATERIALS

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Item</th>
<th>Make</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>MCB/MCCB</td>
<td>Siemens, Merlin Gerin, L&amp;T, Havell’s, GE, ABB.</td>
</tr>
<tr>
<td>3.</td>
<td>MCB Distribution Board</td>
<td>MDS, Legrand, Schyendler, Havell’s.</td>
</tr>
<tr>
<td>4.</td>
<td>FSU/SFU with Fuse, Fuse Base</td>
<td>GE Power Control, Siemens, L&amp;T, Havell’s, Merlin Gerin.</td>
</tr>
<tr>
<td>5.</td>
<td>Air Conditioner</td>
<td>Hitachi, Blue Star, LG, Samsung, Voltas, Carrier, Fedders Lloyd.</td>
</tr>
<tr>
<td>6.</td>
<td>Selector Switches</td>
<td>GE, Kayce, L&amp;T (Salzer), Siemens (BCH).</td>
</tr>
<tr>
<td>7.</td>
<td>Indicator Lamp</td>
<td>MDS Legrand, Siemens, Teknic</td>
</tr>
<tr>
<td>8.</td>
<td>Meters</td>
<td>AE, MECO, MDS, Legrand, L&amp;T.</td>
</tr>
<tr>
<td>9.</td>
<td>Timers</td>
<td>L&amp;T, EAPL, MDS.</td>
</tr>
<tr>
<td>10.</td>
<td>Wiring &amp; Control Cables (HRFR)</td>
<td>Finolex, Fort Gloster, Havell’s, CCI, Skytone.</td>
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<tr>
<td>11.</td>
<td>LTUG Cable</td>
<td>Finolex, Fort Gloster, CCI, Havell’s, Asian, Premier.</td>
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<tr>
<td>12.</td>
<td>CT, PT</td>
<td>AE, Pragati, MDS Legrand, Indo tech, L&amp;T.</td>
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<td>13.</td>
<td>Cable Gland High &amp; thimbles</td>
<td>Connet, Bracco, Sibg, Dowelis.</td>
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<td>14.</td>
<td>GI Pipe</td>
<td>BST, Jindal, BEC</td>
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<td>15.</td>
<td>Connectors</td>
<td>Elmex, Connectwell</td>
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<td>17.</td>
<td>M S Pipe</td>
<td>BEC/NIC.</td>
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<td>19.</td>
<td>Telephone Cable</td>
<td>Delton, Finolex.</td>
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<td>20.</td>
<td>Cat VI</td>
<td>AT&amp;T, Avaya, Krone.</td>
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<tr>
<td>22.</td>
<td>GI Metal Trunking with accessories like Junction Boxes</td>
<td>MK Electric, LK Pace &amp; Profab</td>
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<tr>
<td>23.</td>
<td>Light Fixtures</td>
<td>Philips, Wipro, Bajaj, Crompton &amp; Greaves, Havell’s, Asian.</td>
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<td>24.</td>
<td>Lamp</td>
<td>Osram, GE, Philips, Mysore, Crompton Greaves.</td>
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<td>25.</td>
<td>RJ11 with shutter</td>
<td>Anchor, Roma, MK.</td>
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<td>26.</td>
<td>RJ45 Jack</td>
<td>Avaya, AT&amp;T, Krone.</td>
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<td>27.</td>
<td>MS Conduit</td>
<td>BEC, AKG.</td>
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<td>28.</td>
<td>Surface Information Outlet</td>
<td>Avaya, Krone, AT&amp;T.</td>
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<td>29.</td>
<td>4 core 14/36 shielded cable</td>
<td>ISI Mark.</td>
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<td>30.</td>
<td>8 core 14/36 shielded cable</td>
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<td>31.</td>
<td>650/1100 volts, 24/0.2 mm copper conductor PVC insulated for music system</td>
<td>DCI.</td>
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<td>32.</td>
<td>LT Power Capacitor (Heavy Duty low loss mixed di-electric)</td>
<td>Siemens, Epcos, L&amp;T Meher, Universal</td>
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<td>33.</td>
<td>Contactors</td>
<td>Siemens, ABB, L&amp;T.</td>
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<td>34.</td>
<td>LT Switch Gear with HRC Fuse</td>
<td>Siemens, ABB, GE, L&amp;T, Havell’s.</td>
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<tr>
<td>35.</td>
<td>Selector Switch</td>
<td>MDS Legrand, KAYCEE, BCH, L&amp;T Salzer, Siemens</td>
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<tr>
<td>36.</td>
<td>Indicating Lamp</td>
<td>MDS Legrand, Siemens, Teknis, L&amp;T</td>
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<td>37.</td>
<td>RJ11 cable</td>
<td>Finolex.</td>
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<td>38.</td>
<td>Fan/ Air Circulator/ Air Curtain</td>
<td>Crompton Greaves, Bajaj, Havell’s, Almonard, Usha.</td>
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<td>39.</td>
<td>Inverter</td>
<td>SUCAM, LUMNUS, MICROTEK</td>
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<td>40.</td>
<td>Digital Meter for KWH</td>
<td>SECORE, HAVELLS</td>
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<tr>
<td>41.</td>
<td>TV Outlet/Socket</td>
<td>MK/MDS-Mosaic, Anchor Roma</td>
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<tr>
<td>42.</td>
<td>Patch Box</td>
<td>Avaya, AT&amp;T, Krone</td>
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Note: The contractor should obtain prior approval for the materials to be used in the work from the Client/Consultant before commencing the work.
<table>
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<tr>
<th>Sl No</th>
<th>Description of Standard</th>
<th>Brief Description of the Standard</th>
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<td>1</td>
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<td>14</td>
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<td>CPWD General Specifications for Electrical works Part - I Internal - 1994 as amended upto date,</td>
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<td>3</td>
<td>CPWD General Specifications for Electrical works Part - II external - 1994 as amended upto date</td>
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**F STATUTORY RULES & REGULATIONS**

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<table>
<thead>
<tr>
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<tr>
<td>1</td>
<td>The Electricity Act 2003</td>
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<tr>
<td>2</td>
<td>National Electrical Code</td>
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*Note*: The above list is only illustrative and not exhaustive and the standards shall be as amended upto date.
20 TECHNICAL SPECIFICATIONS FOR FIRE FIGHTING SYSTEM

20.0 Main Fire Pump

The main fire pump shall be of horizontal, centrifugal type provided with a cast iron body. The internal working parts of the pump shall be of bronze construction. The shaft shall be of steel construction. The pump shall be provided with the necessary gland packing.

The pump shall be of end suction type with the outlet on the top.

The pump shall have a delivery of 97 CuM/hr at a delivery head of 35 mts. The pumping shall be based on a nominal speed of 2900 rpm. The shut off head of the pump shall not exceed 120% of the rated head and the head at 150% discharge shall not fall below 60% of the rated head.

The pump shall be coupled to a suitable motor of SPDP construction as per IS 325. The motor shall work at a speed of 2900 rpm at working conditions of 415 V and 50 MHz. The insulation shall class F insulation.

The pump shall be directly coupled to the motor with a coupling. The pumpset shall be mounted on a common base plate. The pumps shall be mounted on a suitable concrete base in order to absorb the vibration.

The main fire pump shall be capable of starting automatically, and the stopping of the pump shall be manual.

20.1 Jockey pump

The jockey pump shall be of horizontal, centrifugal type with a cast iron body. The internal working parts shall bronze construction. The pump shall have a discharge of 10.8 Cum/hr with a delivery head of 35 mts. the pump shall have all other characteristics as detailed in the description of Main fire pump.

The pump shall be coupled to a suitable motor of TEFV construction as per IS 325. The motor and the pump shall work at a speed of 2900 rpm and shall be mounted on a common base frame.

The jockey pump shall be provided with facility of automatic start and stopping. The pump shall come into operation of sensing the pressure drop in the system and the stopping of the pump shall be automatic on the pressure reaching the system pressure. The pump shall be capable of sustaining the system pressure at the desired level.

20.2 Standby Fire Pump

The standby pump shall be driven by a diesel engine. The pump shall be horizontal, centrifugal type with cast iron casing and bronze internals. The shaft shall be of steel. The pump shall be capable of delivering 97 CuM/hr at delivery head of 35 mts.
The pump shall be capable of delivering 150% of the discharge at 65% of the rated head. The shut off head shall not exceed 120% of the rated head.

The pump shall be coupled to a suitable diesel engine with individual head assemblies. The engine shall be capable of operating at a speed of 1800 rpm.

The engine shall be water-cooled type with the necessary cooling system piping. The engine shall be of self starting type with adequate battery back-up. The panel shall have an automatic charging circuit. The engine shall be provided with a fuel tank of adequate capacity to ensure that the engine runs for a period of at least 4 hours continuously.

The pump shall be capable of starting automatically, on sensing the pressure drop in the system. However the stopping of the standby pump shall be manual.

20.3 PIPING

The rind main piping shall be MS black pipes confirming to IS 1239 class B. the fittings shall be of IS 1239 part II. The pipes shall be provided with a coat of metal primer and two coats of red paint.

The pipes shall be installed on the ceiling of the basement and welding of the pipes shall be carried out as per the instructions given in this document.

The flanges shall be drilled to IS 1538.

The above ground piping shall be of MS black pipes confirming to IS 1239 class B with the fittings confirming to IS 1239 part II. The flanges shall be drilled as per IS 1538.

The sprinkler piping shall be with fittings of forged type for pipes up to 40 mm diameter and with weldable type fittings for all pipes of 50 mm and above. The pipes shall be installed in the sleeves provided in the beams and columns.

The pipes shall be fastened to the ceiling and the walls with proper supports maintaining the designated distances between supports.

The underground pipes shall be provided with pypkote (4 mm) treatment as per IS 10441.

20.4 Valves

(a) Butterfly valves

The butterfly valves shall be wafer type confirming to BS 5155 which can be easily mounted between 2 flanges. The valves shall be of Cast iron body and shall be provided with a flow control arrangement.
(b) Gate Valves

The gates shall be of Cast Iron or Cast Steel type confirming to IS 780. The internal shall be of bronze and the valve shall be provided with gland packing. The flanges shall be as per IS 1538.

(c) Non-return Valves

The non-return valves shall be of dual plate swing check type with a cast iron body. The valves shall be as per API 594. The valves must be such that they can be easily fitted between two flanges.

(d) Valve Chambers

The sluice valve chamber covers shall be provided at the ground floor level in order to operate the valves located in the basement ceiling level.

20.5 HYDRANT & ACCESSORIES

HYDRANT VALVES

The hydrant valve is of oblique type with a single outlet for the yard hydrants and twin outlet for the landing hydrant. It is made out of gunmetal with instantaneous coupling for fixing the fire hose. The valve is as per IS 5290 with IS approval. The valve has been mounted on a 80 mm dia standpost at a height of 1 mtr approximately above ground level for ease of operation. The hydrant in the landing shall be mounted on the wet riser to be located in the staircase.

STANDPOST

The standpost shall be made out of MS black pipe and shall be suitable to carry the single headed hydrant valve and shall have a length in order to limit the level of the hydrant valve to 1 mtr above the ground level.

BRANCHPIPE

The branch pipe shall be of gunmetal construction with 63 mm female instantaneous inlet arrangement, male threaded outlet and provided with a hexagonal heavy quality nozzle. The branch pipe shall be as per IS 903.

CONTROLLED PERCOLLATION HOSE

The controlled percolation hose shall be as per IS 8423 fitted with gun metal couplings.

HOSE COUPLINGS

The hose couplings shall be of gunmetal construction of 63 mm size instantaneous spring locking arrangement. It shall comprise of male and female halves with rubber washers. The couplings shall confirm to IS 903.
**HOSE CABINETS (External)**

The hose cabinets for the external hydrants shall be of MS construction made of 18 swg material, glass fronted and provided with hinged door and locking arrangement. The cabinet shall be painted red in colour.

The cabinet is to accommodate two pieces of hoses of 15 mts length fitted with couplings and one branch pipe. The hose cabinet shall be mounted on the wall with dimensions as 750 mm x 600 mm x 250 mm.

**HOSE CABINETS (Internal)**

The internal hose cabinets shall be for the hydrants on the wet riser. The cabinets shall be of MS construction with 16 swg material, two door glass fronted and locking arrangement. The hose cabinet shall be painted red in colour.

The internal hose cabinet shall accommodate 2 nos of 7.5 mts hoses fitted with couplings, one branch pipe and a hose reel with 30 mts of 3/4\textsuperscript{th} inch hose. The size of the hose cabinet shall be 1000 mm x 900 mm x 450 mm.
21 TECHNICAL SPECIFICATION OF MACHINES:

21.1 Water Treatment Plant:-

21.1.1 Quality of Raw Water: Bore wells water shall be used for process plant.

   Note: Treated water must confirm to standards for Packaged Drinking Water as per IS: 14543-2004 as well as parameter set by IRCTC within IS 14543-2004 after examining the actual parameters of permeate water. TDS of product water should not exceed beyond 100 PPM.

21.1.2 Drinking Water Treatment Plant:- Design Requirements

   21.1.2.1 Drinking Water Treatment Plant shall be designed to remove suspended and colloidal impurities, organic matter and pesticides if any. All other parameters like TDS, Hardness, Silica and Chlorides shall conform to IS: 14543-2004. The treatment scheme shall confirm generally to the process flow block diagram shown.

   21.1.2.2 Water Treatment plant shall be designed for local panel based automatic operation. Capacity of water treatment plant shall be 5 cubic meter per hour.

   21.1.2.3 Pre treated water from clarifier or Bore well water will be dosed with sodium hydrochloride for oxidation of residual organic matter & COD and stored in a closed reservoir in RCC lined internally with glazed tiles (constructed by IRCTC). The tank will have a slope at the bottom to facilitate cleaning.

   21.1.2.4 Water will then be passed through an Activated Carbon filter (ACF) for removal of free chlorine. One more ACF filled with Norit Carbon media will be provided for removal of pesticides residues. These carbon filters will be backwashed once in a day.

   21.1.2.5 The filtered water from the carbon filter shall flow into a softener for removal of hardness before feeding to an ultra filtration (UF) plant.

   21.1.2.6 Soft water will then be pumped to UF membrane skid through 100 micron basket strainer. The membrane will remove suspended solids, colloidal matter, dissolved organic matter, COD/BOD, heavy metals, colloidal silica. UF permeate will be stored in a storage tank and pumped through micron cartridge filter and to the RO skid by means of high pressure pumps to the downstream Reverse Osmosis unit (RO Plant) for reduction of TDS.

   21.1.2.7 The permeate stream (product water) from RO Plant shall be passed through a calcite filter for correction of pH, micron cartridge filters No. 1 (1 µ) and No. 2 (0.2 µ) followed by UV and Ozonator prior to bottling plant to produce bacteria free bottled water.

   21.1.2.8 UV & Ozonator are provided to control all bacteria and produce totally bacteria free water with shelf life of bottled water six months from the date of manufacturing with zero bacteria during shelf life. Vendor to confirm shelf life.
21.1.2.9 Bottles shall be capped and sealed during filling with treated UV & ozonated product water under hygienic condition to eliminate ingress of any bacteria during filling. All Drinking water bottles shall be under Brand name of ‘Rail Neer’. All the effluent streams – Carbon filter backwash, UF backwash shall be mixed together shall be utilized for irrigation of trees & plants in railway land or shall be discharged into the rain water harvesting pit.

21.1.2.10 The Drinking water treatment plant shall be operated in a manner that final treated water for packaging conforms to IS 14543-2004.

21.1.3 Detailed Scope of work with specifications and Terminal Points:

Broad scope of the work includes all equipments, electrical, instruments, chemical dosing systems, all interconnecting piping, valves, fittings etc. and accessories for the treatment plant, bottling plant (for permeate water line), Air Compressors (for pneumatic line), Lab’s instruments and equipments as per details given below etc. Material of construction for all skids will be MS powder coated unless otherwise specified.

21.1.3.1 Sodium Hypochlorite (NaOCl) Dosing System: One Set

Sodium Hypochlorite Dosing System consisting of one vertical measuring cum dosing tank in FRP complete with inlet, outlet, overflow and drain connections and fitted with level indicator and two nos. electronic metering pump complete with suction and discharge pipe work and valves for dosing sodium hypochlorite. The dosing rate is 20 mg/l of sodium hypochlorite. The Sodium hypochlorite shall confirm to BIS: 11673-1992 (Grade-II)

21.1.3.2 Multi Grade Filter (MGF)

<table>
<thead>
<tr>
<th>One No.</th>
<th>Vertical Multi Grade Filter shall be of MSRL construction and for normal flow 10 m³/hr complete with frontal pipe work and valve, inlet distributor, initial charge of media</th>
</tr>
</thead>
<tbody>
<tr>
<td>One No.</td>
<td>Pressure gauges at the outlet</td>
</tr>
<tr>
<td>One No.</td>
<td>Rate of flow indicator</td>
</tr>
</tbody>
</table>

21.1.3.3 Feed Water Pumps:

<table>
<thead>
<tr>
<th>Two nos.</th>
<th>Horizontal, motor driven centrifugal pumps (1W+1S) each of capacity 10 m³/hr at a discharge head of 40 mwc (min) complete with motor, base plate, suction and discharge pipe work and valves.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two nos.</td>
<td>Pressure gauges one each at the discharge head of each pump.</td>
</tr>
<tr>
<td>One no.</td>
<td>Level Switch in storage tank.</td>
</tr>
</tbody>
</table>

21.1.3.4 Activated Carbon Filter (for De-chlorination):

<table>
<thead>
<tr>
<th>One No.</th>
<th>Vertical Activated Carbon filter shall be of MSRL construction</th>
</tr>
</thead>
</table>

192
and for normal flow 10 m³/hr complete with frontal pipe work and valve, inlet distributor, initial charge of Activated Carbon having minimum iodine value 1000 plus and treated water collection system.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One No.</td>
<td>Pressure gauges at the outlet</td>
</tr>
<tr>
<td>One No.</td>
<td>Rate of flow indicator</td>
</tr>
</tbody>
</table>

### 21.1.3.5 Activated Carbon Filters (for pesticide removal):

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Nos.</td>
<td>Vertical activated carbon filters shall be MSRL construction and for normal flow 10 m³/hr complete with frontal pipe work and valve, inlet distributor; initial charge with NORIT ROW 0.8 SUPRA extruded activated carbon (NORIT NV or equivalent) and treated water collection system. The carbon filters shall be designed for a combined empty bed contact time of 20 minutes.</td>
</tr>
<tr>
<td>One No.</td>
<td>Pressure gauge at the outlet</td>
</tr>
<tr>
<td>Two Nos.</td>
<td>Horizontal, centrifugal pumps (1W+1S) each of suitable capacity complete with motor, base plate, suction and discharge pipe work and valves. The pumps shall be of SS-316 construction. (Note-Same pumps will be used for back wash of ACF.)</td>
</tr>
</tbody>
</table>

### 21.1.3.6 Softener (Optional):

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One no.</td>
<td>Automatic Softener for normal flow rate of 10 m³/hr, MSRL vertical pressure vessel complete with frontal pipe work, auto valve inlet distributor, initial charge of food grade strongly acidic cation resin based on sodium cycle and treated water collection system with all accessories etc. Capacity of softner shall be such that cation resin regeneration shall not be required more than once in 24 hrs operaion at present level of hardness of raw water.</td>
</tr>
<tr>
<td>One lot</td>
<td>One lot Pipe work &amp; valves from outlet of filter to softener</td>
</tr>
<tr>
<td>One no.</td>
<td>Outlet pressure gauge</td>
</tr>
<tr>
<td>One no.</td>
<td>Impulse type water meter to initiate regeneration.</td>
</tr>
<tr>
<td>One no.</td>
<td>FRP commercial salt (NaCl) measuring tank for regeneration of the cation resin complete with all accessories with all piping &amp; valves for dosing sodium chloride solution for cation unit.</td>
</tr>
<tr>
<td>One no.</td>
<td>One set of testing kit for checking the hardness at outlet of the softener &amp; also as per during operation &amp; maintenance requirements.</td>
</tr>
</tbody>
</table>

### 21.1.3.7 Ultra Filtration (UF) system:

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One set</td>
<td>Basket Screen Filter of 100 micron of SS-316 for design flow rate of 10 m³/hr.</td>
</tr>
<tr>
<td>One set</td>
<td>One set of UF system complete with UF membranes with MWCO of 1 lakh Dalton or less, back flush, cleaning/ fast flush pumps, instrumentation &amp; necessary control. The UF should be PLC based with automatic changeover of functions. The system shall be</td>
</tr>
</tbody>
</table>
21.1.3.8 **UF permeate storage tank:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One No.</td>
<td>FRP tank of capacity 15 m³ with Air release Micron filter for control of air bacterial contamination complete with inlet, outlet, overflow and drain connection and fitted with level indicator.</td>
</tr>
</tbody>
</table>

21.1.3.9 **Micron Cartridge Filter Feed Pumps:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two nos.</td>
<td>Horizontal, centrifugal motor driven pumps (1W + 1S) each of capacity 10 m³/hr and discharge head of 40 mwc complete with motor, base plate, suction and discharge pipe work and valves. Pumps shall be of SS 316 construction.</td>
</tr>
<tr>
<td>Two nos.</td>
<td>Pressure gauge one each at the discharge head of each pump.</td>
</tr>
</tbody>
</table>

21.1.3.10 **Micron Cartridge Filter:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One no.</td>
<td>Micron cartridge filter No. 1 complete with SS 316 housing and requisite number of micron cartridge filter of 10 micron nominal rating complete with inlet, outlet and drain connections.</td>
</tr>
</tbody>
</table>

21.1.3.11 **High pressure pumps for RO:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two nos.</td>
<td>Vertical, centrifugal high pressure pumps (1W + 1S) each of suitable capacity as per RO specification complete with motor, base plate, suction and discharge pipe work and valves. Pumps shall be of SS 316 construction.</td>
</tr>
<tr>
<td>Two nos.</td>
<td>Pressure gauge one each at the discharge head of each pump.</td>
</tr>
</tbody>
</table>

21.1.3.12 **Reverse Osmosis (RO) System:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One No.</td>
<td>Reverse Osmosis (RO) skid complete with a set of pressure tubes containing <em><strong>thin film composite polyamide membranes</strong></em>, feed inlet, permeate outlet and reject outlet, pipe work and valves and associated instrumentation and controls. The plant shall be designed to treat 12.5 m³/hr of feed with 65-75% recovery to produce product water of 5 m³/hr. <strong>RO system should be semi automatic</strong></td>
</tr>
<tr>
<td>One set</td>
<td>One Oxygen Reduction Potential (ORP) with all accessories and meter complete with tapping connection &amp; isolation valves etc. all respect for on-line monitoring of oxidant (i.e. Chlorine) including sampling &amp; monitoring at inlet to RO plant.</td>
</tr>
</tbody>
</table>

21.1.3.13 **RO Cleaning in Place system:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One No.</td>
<td>RO Cleaning in Place system complete with SS 316 tank, one pump of suitable capacity and all associated valves and pipe lines.</td>
</tr>
</tbody>
</table>
21.1.3.14 **pH Correction with Calcite Marble Media:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One No.</td>
<td>pH correction system consisting of Calcite crushed and screened white marble media in SS 316 vessel complete with frontal pipe work and valves, inlet distributor, initial charge of Calcite marble media of make Clack Corporation, USA or equivalent. The Calcite white marble media shall be of tested quality for health effects (test certificate to be furnished) and should confirm to specification given by Clack Corporation USA or equivalent. The filter shall be designed for a flow rate of 5 m³/hr.</td>
</tr>
</tbody>
</table>

21.1.3.15 **RO Permeate Storage Tank:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One No.</td>
<td>SS-316 tank of capacity 5 m³ with Air release micron filter for control of air bacterial contamination complete with conical hopper at bottom and inlet, outlet, overflow and drain connection and fitted with level indicator.</td>
</tr>
<tr>
<td>One No.</td>
<td>pH meter at outlet of Tank.</td>
</tr>
<tr>
<td>One No.</td>
<td>Conductivity meter at outlet of tank.</td>
</tr>
</tbody>
</table>

21.1.3.16 **RO Permeate Water Pumps:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two nos.</td>
<td>Horizontal, centrifugal pumps (1W+1S) each of capacity 5 m³/hr at a discharge head of 30 mwc complete with motor, base plate, suction and discharge pipe work and valves. The material construction of pumps SS-316.</td>
</tr>
<tr>
<td>Two nos.</td>
<td>Pressure gauges one each at the discharge head of each pump.</td>
</tr>
<tr>
<td>One no.</td>
<td>Level Switch in storage tank.</td>
</tr>
</tbody>
</table>

21.1.3.17 **Ultra violet (UV) system for Disinfection:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Set</td>
<td>A set of the Ultraviolet (UV) system shall be of wall mounted complete with UV lamp, indication for lamp ON &amp; OFF, UV dosage system complete with all necessary accessories, SS piping etc. The system shall be designed for a flow rate of 5 m³/hr.</td>
</tr>
</tbody>
</table>

21.1.3.18 **Polishing Cartridge Filters:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Sets</td>
<td>Polishing Cartridge filters no.2 &amp; 3 containing 1 micron and 0.2 micron rating of cartridges of PTFE compatible with UV &amp; ozonated water in stainless steel housing (SS 316) complete with inlet, outlet, drain, isolation and air vent valve and inlet and outlet pressure gauges. The cartridges shall be of Parker, USA or equivalent make. Each filter shall be designed for a flow rate of 5 m³/h.</td>
</tr>
<tr>
<td>One set</td>
<td>Inlet and outlet pressure gauges for each cartridge filter.</td>
</tr>
</tbody>
</table>

21.1.3.19 **Ozonator:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One set</td>
<td>A set of oxygen generator silent arc type ozone generation unit,</td>
</tr>
</tbody>
</table>
ozone dosing system, ORP controller, ozone destruction unit, necessary SS piping and Ozone contact column of SS316 for contact time of 10 minutes (minimum). The system shall be designed for a flow rate of 5 m³/hr such that 0.1 to 0.2 mg/l of ozone is kept as residual after the ozone contact column. Two Nos. Ozone Circulation Pumps of suitable capacity in SS 316 construction to be provided.

**21.1.3.20 Bottle Rinse Water Pumps:**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two nos.</td>
<td>Horizontal, centrifugal pumps (1W+1S) each of suitable capacity complete with motor, base plate, suction and discharge pipe work and valves. The material construction of pumps SS-316.</td>
</tr>
<tr>
<td>Two nos.</td>
<td>Pressure gauges one each at the discharge head of each pump.</td>
</tr>
</tbody>
</table>

**21.1.3.21 Bottle Feed water Pumps:**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two nos.</td>
<td>Horizontal, centrifugal pumps (1W+1S) each of suitable capacity complete with motor, base plate, suction and discharge pipe work and valves. The material construction of pumps SS-316.</td>
</tr>
<tr>
<td>Two nos.</td>
<td>Pressure gauges one each at the discharge head of each pump.</td>
</tr>
</tbody>
</table>

**21.1.3.22 Water Recovery System:**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Set</td>
<td>Water Recovery System complete with piping, two pumps of suitable capacity, one cartridge filter of 10 micron nominal rating in MSRL housing with 2.5 m³/hr flow rate and other accessories to feed the bottle rinsed water from filling machine and UF reject water to Raw Water Tank.</td>
</tr>
</tbody>
</table>

**21.1.3.23 Piping for Water treatment and recycling system:**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Lot</td>
<td>Interconnecting pipe work (water pipes &amp; pneumatic pipes) and valves with all fittings and accessories in SS 316 along with all structural such as pipe supports, cable trays, tubing etc for water treatment and water recycling system. All pipe line shall be seamless stainless (SS-316) meeting standard ANSI/ASME/IS 6913.</td>
</tr>
</tbody>
</table>

**21.2 PET BOTTLE BLOWING MACHINE:**

Supply, installation and commissioning of one set fully automatic PET bottle blowing machine, having minimum production capacity of 4200 BPH for bottle size 1000 ml with one set mould installed as per design approved by IRCTC. Capable of producing bottles upto 2000 ml size. The blowing machine should have following features-

- Auto Perform Hopper Loader & Conveyor
- Heat treatment oven banks
- Pneumatic/ hydraulic Stretching
- Neck Protection
- Neck Size: 19 mm to 33 mm
• Stand alone electric panel with Air conditioner/cooling system
• Stand alone Panel for PLC with Touch Screen
• High speed B&R Microprocessor/PLC based
• Air filter at machine inlet (HP & LP)
• Air receivers for high and low pressure
• Electricity 415 volts (±) 5%
• Manifold for inlet connection for Air & Water
• One (1) set of mould
• Set of Installation Spares
• Set of Tools
• Roadworthy packing
• PET Pre-forms bottles Storage System and Feeding System
• Infra Red Temperature sensor at Oven Exit
• Controls to vary heating zones individually
• Protection to avoid heating of Pre-form neck area in the oven
• Oven Temperature measurement and Indication
• Powder coated MS hood for oven assembly
• No Pre-form - No Blow
• Separate Blow & Pre-blow controls
• Gauge to indicate Pre-blow and Final Blow Pressure
• Automatic Loading of Pre-forms
• LCD Screen
• Manifold for Chilled Water circulation to Mold for Uniform Temperature Distribution
• Door Safety
• Automatic Voltage Compensation for ± 5 % Power Fluctuation
• Pneumatic/hydraulic Clamping
• Air Recovery System
• Inline preform infeed
• Inline Bottle Out feed

Make- SIDELE, Krones, KHS, Shyam Plastic, Sacmi, Tachlong

21.3 AIR COMPRESSORS:

Air Compressor should deliver “Oil free” compressed air of matching quantity (CFM) and pressure (bar) requirement of bottle blowing machine offered. Compressor should be water-cooled, continuous heavy duty, reciprocating, non-lubricated type of Air Compressor.

The Package Air Compressor should be complete with Air Compressor, Aftercooler, Air Receiver, Control panel alongwith interconnecting air piping on the skid upto discharge flange of the Air Receiver. Water piping will be complete with single inlet/outlet. The package shall be complete with all electrical connections on the skid including cabling between the control panel and the field mounted switches. However, IRCTC will provide water connection to the inlet from his inlet header and the discharge piping to the discharge header.
• Heat resistant paint in cylinder air passages to prevent rusting.
• Heavy duty well ribbed cast iron frame casting.
• Force-feed lubrication to all bearings for crankshaft, connecting rods, crosshead pins and crosshead.
• Main oil pump gear driven by compressor shaft Forged steel crankshaft, connecting rods and carbon steel piston rods.
• Piston rings, wear rings and piston rod packing for all stages.
• Distance piece and extra long piston rod with oil slinger designed to prevent frame oil from carrying into the air cylinder.
• Motor totally enclosed sheet metal belt guard, with access cover for belt tensioning.
• Motor sheave with busing and set of v-belts.
• Air pressure relief valves installed on coolers.
• Control Panel consists of following:
  • Three Step capacity Control (0-50-100%). Loading and unloading through pressure transducer & solenoid valve
  • 415 V AC/ 3 PH / 50Hz input power supply
  • 110 V AC control circuit
  • E-stop, Start/Stop, Overload, Accept/Test/Reset push buttons through Intellysis
  • Indicating Lamps – control power on
  • Indication, Alert & Shutdown Options

Make (Compressor): Ingersoll-Rand, Chicago Pneumatic, Air Francois

21.4 WATER COOLED CHILLER:

Completely packaged Skid Mounted Unit of matching capacity with blowing machine ready for installation with instrumentation and controls and include:

• Refrigeration Compressor.
• Direct Expansion Type Chiller.
• Refrigeration Condenser.
• Complete Refrigeration kit with instruments as Dryer, Expansion Device, Sight Glass, Accumulator, etc.
• All interconnecting Refrigeration and Liquid Piping.
• Digital Temperature Indicating Controller.
• Control Panel for Automatic Operation of Chiller.
• All necessary Safety Controls with interlocks for the system.
• First Charge of Refrigerant & Oils.
• Insulated Stainless Steel Water Tank

Make-Super Chiller, Reynolds, Mellcon, Premier

21.5 COOLING TOWER:

Forced air cooled cooling tower for cooling of higher temperature water passes through compressor and chiller. Capacity of the cooling tower should be 25 % higher than the
requirement of one set of LP&HP compressor and one bottle blowing machine. Supporting steel grillage, anchor bolts, starting equipment, wiring, piping External to the cooling tower, circulation water pumps and instrumentation shall also be provided/supplied. Make-Paharpur/Armec.

21.6 AIR CONVEYER:

Technical feature:

- Structure of SS. 304
- Air Conveyer will convey the empty bottle from blowing station to RFC machine.
- Minimum vibration in the conveyer operation.
- Filter/Fan housing should be SS construction.
- Conveyer should be provided with adequate number of blower and HEFA filters.
- Conveyer should have emergency stop function and closure of all rotating part.
- Conveyer should be provided with adjustable guides.

Technical specification:

- Product size : 1000 ml bottle
- Operation : Automatic PLC based
- Speed : 90 BPM (bottle per minute)
- Drive : A.C. drive VFD
- Bottle Holding Capacity : for minimum 3 minutes of production capacity of 1000 ml bottle

Make : HYMECH (Mumbai) or HILDEN (Mumbai) or HIEMENS (Faridabad) or SELVEL (Mumbai) or ITW or SATTELITE, Sacmi, Techlong.

21.7 AUTOMATIC RINSING-FILLING AND CAPPING MACHINE:

Salient features:

- Conveyer will convey the bottle for Rinsing.
- Ac frequency variable drive for variable speed with constant torque
- Automatic rinsing mechanism to rinse the bottle before filling.
- Preferred make of PLC: Siemens/Mitsubishi/eqv.
- Should be in conjunction with the air conveyer coming from blowing machine on one side and on other with labeling and carton packing machine. The machine should be with appropriate feeder.
- The machine should be able to handle different capacity bottle size with minimum required change of parts.
- Machine should be stainless steel finish
- Machine should have automatic motors speed control
- Machine should have PLC with full safe logic.
• Machine settings should not get disturbed due to power failure. Machine should not restart without human intervention
• Machine should have emergency stop function and closure of all rotating parts
• Machine should have hopper and universal cap feeder.
• Main body of the machine shall be M.S. Clad with S.S-304.

Technical Specification:

• Product size : 1000ml bottle
• Bottle size : Approx. 274 mm height and 78 mm dia.
• Speed : 90 BPM (bottles per minute)
• Drive : A.C. drive VFD

Make : Hymech (Mumbai) or Hilden (Mumbai) or Hiemens (Faridabad) or KHS or Krones, Sacmi, Techlong.

21.8 MECHANICAL CONVEYER:

Technical features:

• Structure of SS. 304
• Mechanical Conveyer will convey the filled bottle for manual labeling, heat shrinking and case packing.
• Ac frequency variable drive for variable speed with constant torque
• Conveyer length suitable for manual labeling.
• Minimum vibration in the conveyer operation.
• Conveyer should be stainless steel finish
• Conveyer should have automatic motors speed control
• Conveyer should have emergency stop function and closure of all rotating parts.
• Conveyer should have sufficient width suitable for 500 ml /1000 ml PDW bottle.
• Track section supported on rugged tripod stand of SS, adjustable brackets, having SS channel suitable for adjusting bottle size.
• The adjustment of width of the guides for any changeover is easy and no external tool is required to adjust the guides.
• The exposed framework, drive guards etc. shall be made of SS.
• Conveyors should have SS tray underneath to collect drips/spillage if any.

Technical Specification:

• Product size : 500 ml/1000 ml bottle
• Operation : Automatic PLC based
• Speed : 120 BPM (bottles per minute)
• Drive : A.C. drive VFD
• Bottle Holding Capacity : for minimum 4 minutes of production capacity of 1000 ml bottle between filler & labeller and labeller & shrink pack m/c each.
21.9 AUTOMATIC WRAP AROUND LABELING MACHINE:

Salient Features:

- Converyer will convey the bottle for labeling.
- Ac frequency variable drive for variable speed with constant torque
- Wrap around mechanism to wrap the label on the bottle.
- Preferred make of PLC: Siemens/Mitsubishi/or equivalent.
- Should be in conjunction with the filling and capping machine on one side and on other with carton packing machine. The machine should be with appropriate feeder.
- The machine should be able to handle different label size which will paste label on round container.
- Machine should be stainless steel finish
- Machine should be with label dispenser, horizontal conveyors with adjustable guides to handle different size round containers.
- Machine should have automatic motors speed control
- Machine should have label change system with definite program from key board.
- Machine should have proper label dispensing system.
- Machine should have automatic label unwind with photocell for end of reel control and machine stop.
- Machine should have standby power source for heat tunnel conveyor.
- Machine should have back paper rewinding unit.
- Machine should have PLC with full safe logic.
- Machine settings should not get disturbed due to power failure. Machine should not restart without human intervention
- Machine should have emergency stop function and closure of all rotating part
- Main body of the machine shall be M.S. Clad with S.S -304.

Technical Specification

- Product size : 1000ml bottle
- Label size : Maximum label size height 70 & length 300 mm
- Speed : 120 BPM ( bottle per minute)
- Drive : A.C. drive VFD

Make : Hymech (Mumbai) or Hilden (Mumbai) or Hiemens (Faridabad) or KHS or Krones, Sacmi, Techlong
21.10 SHRINK PACKAGING MACHINE:

Web Sealer:

- Web Sealer should be suitable for wrapping, sealing and cutting the LDPE film on 12 bottles of 1000 ml in the matrix of 3x4.
- The control panel should be Heavy Duty PLC base fully automatic and operator friendly.
- The covers and all possible parts should be of SS-304.
- The Heavy duty infeed slat conveyor carrying 12 bottle in the matrix of 3x4 to web sealer should have variable speed device of reputed make such as ABB/Allen Bradly/Siemens/ or equivalent.
- The unwinding of Shrink film from rolls should be automatic.
- The web-sealer should be with all safeties and emergency switches.
- The web-sealer should have manual version also.
- The web-sealer should have top and bottom roll mounting attachment and a motorized unwinding system along with dancing rollers and twin sealing bar.

Heating Tunnel:

- The size of Heating Tunnel should be sufficient enough to shrink the polythene tightly on 12 bottle pack of 1000ml bottle in the matrix of 3x4.
- Tunnel should have double layer high quality insulation to prevent heat loss.
- Heaters of sufficient power controlled by programmable automatic temp. Controllers and solid state Relays should be provided.
- Wire mesh conveyor (Heavy Duty) should be with variable speed drive of reputed make such as ABB/Allen Bradly/Siemens/ or equivalent.
- Covers of Tunnel should be of SS-304.
- Sufficient number of air blowers to agitate the hot air in the tunnel should be provided in top.
- The control panel of Tunnel should be operator friendly.
- The tunnel should be with all safeties and emergency switches.
- At the end of tunnel, there should be a blower for cold air for shrinking of hot polythene film.
- A SS roller conveyor with downward slope is required to be provided at the outlet of tunnel. Its length should be approx.2.0 Meter.
- Capacity of the shrink packaging machine shall be 8 cases per minute.
- Standby power source/Inverter.
- Out feed conveyor approx. 2 meters.
- Capacity: 8 cartons per minute

Make: Minipack, Shrink Packaging Machine (Noida), Krone, KHS, Sacmi, Techlong
21.11 Motor Control Centre (MCC):

Vertical free standing semi draw out motor control centre of sheet steel construction with cable entry from the top complete with bus bar chamber, two incoming feeders with bus coupler, outgoing feeders, ammeters and volt meters

Each outgoing feeder shall have HRC fuser for short circuit protection, power supply isolator. Air break magnetic contactor for power switching for MCC to motor, thermal overload relay, on/off indicating lamps, start/stop push buttons, auxiliary contractors, single phasing protection and cable glands.

Panel fabricated out of 2mm thick CRCA sheet having gasketed hinged door on each cubicle, fully powder coated / enamel painted after seven tank treatment, incorporating horizontal and vertical sleeved copper busbars 'complete with all internal wiring, danger board, two earthing lugs, cable chamber etc. as required 'housing below mentioned switchgears / meters.

**Incoming-1no.,** 1000A, 415V 50Hz FP MCCB complete with neutral & accessories as incomer with O/L, E/F, S/C protections

**Outgoing - Provision of** Suitable nos of outgoing of 415V 50Hz TPN MCCB complete with neutral & accessories as outgoing for all equipment and plant of water treatment in addition of following machine load- Blowing machine (1 No.), LP compressors (1 No.), HP compressor (1 No.), Chiller (1 No.), Cooling Tower (1 No.), Labeling machine (1 No.), RFC machine (1 No.), air conveyor (1 No.), mechanical conveyor (1 no.), shrink wrapping machine (1 No.) cartons taping machine (1 No.) and water treatment plant (8 Nos.). 2 Nos. spare TPNs.

21.12 Local push button stations:

Local push button stations for start/stop of each motor and treatment unit enclosed in a box and located near motor/equipment.

21.13 LT Cabling:

Supply and Installation of LT Power cable, conduit, trench. tray etc. between MCC panel and machine center and control cables between MCC and local push button stations (if required). All cabling for the plant and machinery, utility equipments in the premises shall be done by vendor as per machine/equipment load requirement.

21.14 PIPING WORK:

All air and water pipe lines interconnections, fittings and accessories shall be provided by the vendor. All pipe line shall be seam less stainless (SS-316) meeting standard ANSI/ASME/IS 6913.
21.15 Laboratory’s equipments and instruments:

All instruments and equipments required for testing and analysis as given in tender document shall be supplied by vendor for in-house testing as per the requirement of IS:14543–2004 for Packaged Drinking Water Bottling Plant. In-house laboratory for sampling, testing and analyzing as per the requirement of BIS Doc: STI/14543/7, AUGUST 2011 or amended thereof.

21.16 MECHANICAL

(a) Alignment, lubrication, tensioning of all drives and rotating parts as required during the installation and commissioning be carried out by the vendor strictly as per the instructors guide/ manual issued by the manufacturer.

(b) Interconnecting air and water pipe line as required shall be done by the vendor. Design and drawing of pipe line shall be got approved by vendor before delivery of the material.

(c) In case of any welding or other miscellaneous activity to be carried out for the commissioning of the machinery, then the same need to be get done by the vendor.

(d) The actual size of the line is to be decided by the tenderer as per requirements and layout plan.

21.17 CIVIL WORK:

Vendor will carry out the necessary civil related works as per the design/ engineering details approved by IRCTC. However the vendor reserve the right to bring any suitable change/ modification in the said plan as deemed fit for the optimum productivity, and advise the same to IRCTC.

21.18 Approval of Layout and design: Before starting work, approval of layout, design and routing of pipelines shall be taken from IRCTC.

21.19 INSPECTION AND TESTING:

For automatic bottle blowing machine, compressor, chiller and cooling tower testing shall necessarily be carried out at factory/ manufacturer premises in presence of representative of the Department. All major items/ equipments i.e., motor in assembled condition, associated electrical control panels etc. Shall be offered for inspection and testing at factory/ manufacturers works. The successful tenderer shall give a notice of minimum two weeks for carrying out such tests.

The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make arrangements for the same.
PART-B

OPERATION & MAINTENANCE OF PACKAGED DRINKING WATER BOTTLING PLANT (RAIL NEER) AT Sanand-II (Ahmedabad) & Bhusawal

Operation and maintenance of entire plant shall be done by vendor.

1. Vendor shall provide all services towards successful Operation & Maintenance of Packaged Drinking Water Bottling Plant consisting of the following:
   - Water Treatment Plant
   - Bottle Blowing Plant
   - Bottle Filling, Coding, Labeling and Packaging machines etc.
   - Air Compressors
   - Chillers & cooling tower
   - Water Recycling system
   - Diesel Generating Set, Electrical substation (HT Panel, Transformer, power cable & LT Panel), electrical fixtures within the process area.
   - All facilities (drive in racks, Fork lift trucks and pallets and their accessories) for storage of raw and finished goods.
   - Laboratory facilities for regular analysis of water samples.
   - Any other equipment used for successful operation and maintenance of the plant.

2. Vendor shall provide following services during normal operation of the plant:
   (a) Operation, maintenance, monitoring including effective operation and management of all facilities related to water for the Packaged Drinking Water Bottling Plant.
   (b) Conduct Quarterly review with Indian Railway Catering & Tourism Corporation Ltd. (IRCTC) to document programs, preventive maintenance plans and to target activities towards reducing specific cost of production of bottled water.
   (c) Work closely with IRCTC personnel to provide effective management of treatment facilities, in terms of reliability, quality, safety, security, productivity and process enhancement.
   (d) Provide following Technical services:
      - Evaluate overall water quality./Control norms periodically and recommend measures to reduce consumption of power, water and chemicals/maintain standards.
      - Carry out water and wastewater quality monitoring for performance monitoring on a regular basis.
      - Monitoring for evaluating the performance of water treatment and machinery for bottle blowing, filling and packaging equipment
      - Provide periodic weekly and monthly summary reports to management highlighting the performance, trends, identifying the problem areas and suggestions for improvement.
3. **Maintenance**: Vendor shall perform preventive, routine and breakdown maintenance of all equipment for maintaining the plant in good operating condition.

4. **Services to be offered:**

   Operation, maintenance and monitoring of the plant for duration of 10 years. This includes running the plant, maintenance, operation, monitoring, supply of raw materials, all consumables, spares, chemicals, membranes, filtering media, cation resin, cartridges, replacement of wear out parts etc. & supply of technical & non-technical manpower and ensuring consistently quality & quantity of treated product water vendor should confirm & furnish details of O&M services along with bid.

   Vendor shall provide all services towards successful Operation & Maintenance of Packaged Drinking Water Bottling Plant as per the recommendation of OEMs of plant and machineries.
The following section contains the Integrity Pact, duly signed of 6 pages
PRE-CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the integrity pact ) is made on ____ day of ____ , 2017 between, on one hand, the Indian Railway Catering & Tourism Corporation Limited (IRCTC) acting through Shri ________________, (hereinafter called the “BUYER”, which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s _________________ represented by Shri __________________________________Chief Executive Officer (hereinafter called the “BIDDER/Seller” which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns ) of the Second Part.

WHEREAS the BUYER proposed to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/Public company/Government undertaking / partnership /registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry / Department of the Government of India/PSU performing its function on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealing prior to, during and subsequent to the currency of the contract to be entered into with a view to:

- Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

- Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this integrity Pact and agree as follows:

Commitments of the BUYER

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third Party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
1.2 The BUYER will, during the pre-contract stage, treat all BIDDERs alike, and will provide to all BIDDERs the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERs.

1.3 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(S) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealing related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

**Commitments of BIDDERs**

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair, means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:

3.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, and material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavor to any person in relation to the contract or any other contract with the Government.

3.3 * The BIDDER shall disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

3.4 * The BIDDER shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
3.5 * The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defense stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER shall not use improperly, for purpose of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposal and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER’s firm, the same shall be disclosed by BIDDER at the time of filling of tender. The term ‘relative’ for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. Previous Transgression

4.1 The BIDDER declares that not previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged
hereunder or with any Public Sector Enterprise in India or any Government Department in India could justify BIDDER’s exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on his subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money/Security Deposit

5.1 While submitting financial bid, the BIDDER shall deposit Earnest Money as detailed in Model Bid document with the BUYER through any of the following instruments:

(i) Bank Draft or a Pay Order in favour of M/s IRCTC Ltd, payable at New Delhi.
(ii) A confirmed guarantee by an Indian Nationalized Bank, Promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or thought any other instrument (to be specified in the tender document).

5.2 Security Deposit shall be valid upto a period of five years or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, whichever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violations

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to BIDDER. However, the proceedings with the other BIDDER (s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand
forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In case where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

6.2 The BUYER will be entitled to take all or any of the action mentioned at para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the independent monitor(s) appointed for the purposes of this Pact.

7. Fall Clause

The bidder undertakes that he/she shall not sell or offer to sell the product/products of identical description to any organization, such as any Department of Central Government or any Department of State Government or any statutory undertaking of the Central or a State
Government or a PSU, as the case may be, at a price lower than the price chargeable under this Rate Contract, till the currency of Rate Contract.

In case the supplier sells or offers to sell the product or any product of identical description, during the currency of the contract, at a lower price to any organization such as any Department of Central Government or any Department of State Government or any statutory undertaking of the Central or State Government or a PSU, then the difference in the cost would be refunded by the bidder to the buyer.

8. **Independent Monitors.**

8.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

   a) Shri Sudesh Kumar, IRSEE (Retd.), C-902, classic Apartments, IRWO, Rail Vihar, Phase-3, Sector-57, Gurgaon-122003.

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provide such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department and, should the occasion arise, submit proposals for correcting problematic situations.

9. **Facilitation of Investigation**

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. **Law and Place of Jurisdiction**

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.
11. **Other Legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. **Validity**

12.1 The validity of this Integrity Pact shall be from date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one of several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at **New Delhi on ________, 2016.**

BUYER

Siya Ram

GGM/RNP

IRCTC Ltd.

BIDDER

CHIEF EXECUTIVE OFFICER

Witness

1. __________________________

2. __________________________

Witness

1. __________________________

2. __________________________

* Provisions of these clauses would need to be amended/deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.
PRE-CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the integrity pact) is made on ___ day of ___ , 2016 between, on one hand, the Indian Railway Catering & Tourism Corporation Limited (IRCTC) acting through Shri Siya Ram, GGM/RNP, (hereinafter called the “BUYER”, which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s ___ represented by Shri Chief Executive Officer (hereinafter called the “BIDDER/Seller” which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns ) of the Second Part.

WHEREAS the BUYER proposed to procure (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and

WHEREAS the BIDDER is a private company/Public company/Government undertaking / partnership /registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry / Department of the Government of India/PSU performing its function on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealing prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this integrity Pact and agree as follows:

Commitments of the BUYER

1.1 The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third Party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.

1.2 The BUYER will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
1.3 All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(S) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealing related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

**Commitments of BIDDERs**

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair, means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-

3.1 The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, and material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavor to any person in relation to the contract or any other contract with the Government.

3.3 * The BIDDER shall disclose the name and address of agents and representatives and Indian BIDDERs shall disclose their foreign principals or associates.

3.4 * The BIDDER shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

3.5 * The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorized government sponsored export entity of the defense stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
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3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER shall not use improperly, for purpose of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposal and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER’s firm, the same shall be disclosed by BIDDER at the time of filling of tender. The term ‘relative’ for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4. Previous Transgression

4.1 The BIDDER declares that not previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India could justify BIDDER’s exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on his subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money/Security Deposit

5.1 While submitting financial bid, the BIDDER shall deposit Earnest Money as detailed in Model Bid document with the BUYER through any of the following instruments:

(i) Bank Draft or a Pay Order in favour of M/s IRCTC Ltd, payable at New Delhi.
(ii) A confirmed guarantee by an Indian Nationalized Bank, Promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

Page 3 of 6
(iii) Any other mode or thought any other instrument (to be specified in the tender document).

5.2 Security Deposit shall be valid up to a period of five years or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, whichever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violations

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other store, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In case where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

6.2 The BUYER will be entitled to take all or any of the action mentioned at para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.
6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the independent monitor(s) appointed for the purposes of this Pact.

7. Fall Clause

The bidder undertakes that he/she shall not sell or offer to sell the product/products of identical description to any organization, such as any Department of Central Government or any Department of State Government or any statutory undertaking of the Central or a State Government or a PSU, as the case may be, at a price lower than the price chargeable under this Rate Contract, till the currency of Rate Contract.

In case the supplier sells or offers to sell the product or any product of identical description, during the currency of the contract, at a lower price to any organization such as any Department of Central Government or any Department of State Government or any statutory undertaking of the Central or State Government or a PSU, then the difference in the cost would be refunded by the bidder to the buyer.

8. Independent Monitors

8.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

a) Shri Sudesh Kumar, IRSEJ (Retd.), C-902, classic Apartments, IRWO, Rail Vihar, Phase-3, Sector-57, Gurgaon-122003.

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provide such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Department and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and
the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. **Law and Place of Jurisdiction**

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

11. **Other Legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

12. **Validity**

12.1 The validity of this Integrity Pact shall be from date of signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one of several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at New Delhi on _______, 2016.

BUYER
Siyam Ram
GGM/RNP
IRCTC Ltd.

BIDDER
CHIEF EXECUTIVE OFFICER

Witness
Witness

1. Shri Sunil Gupta, JGM/WVM

2. Shri Archit Singhal, Sr. Sup./RNP/CO

*Provisions of these clauses would need to be amended/deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.*
The following section is the draft Contract agreement consisting of 78 pages
DRAFT CONTRACT AGREEMENT

BETWEEN

INDIAN RAILWAY CATERING AND TOURISM CORPORATION LTD (IRCTC)

AND

...........................

............. (THE DCO)

FOR

CONSTRUCTION, OPERATION & MAINTENANCE OF PDW PLANT

DATED...........................................
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CONTRACT AGREEMENT

THIS AGREEMENT is entered into on this the ……… day of……, 20……..

BY AND BETWEEN:

INDIAN RAILWAYS CATERING AND TOURISM CORPORATION LIMITED, a body corporate incorporated under the Companies Act, 1956 having its Headquarters at ______________ acting through __________________ (hereinafter "IRCTC", which expression shall, unless the context otherwise requires include its administrators, successors and assigns) ) on the first Part;

AND

{………. LIMITED}, a special purpose company incorporated under the provisions of the Companies Act, 1956 and having its registered office at ………, (hereinafter referred to as the “Developer-cum-Operator (DCO)" or “Company” which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns and substitutes) of the second Part.

IRCTC and the DCO shall collectively be known as Parties and individually as Party.

WHEREAS:

A) As part of its efforts to cater to large and increasing demand for packaged drinking water (PDW) sold under its “Rail Neer” brand, IRCTC has decided to undertake construction and operation of PDW Plant on DBFOOT basis at multiple locations.

B) IRCTC had accordingly invited Bidders by its Tender Document No. dated________________________ (the “Tender Document”) for selection of bidders for Development, Operation and Maintenance of PDW Plant and provision of Manufacturing, CFA and Transportation Services and had shortlisted bidders including, the second party being the {the selected bidder/ consortium comprising of …………………, …………………. And …………………… (collectively the “Consortium”) with ……… as its lead member (the Lead Member)}

C) After evaluation of the bids received, IRCTC had accepted the bid of the selected bidder and issued its Letter of Award No.………. dated ……… (hereinafter called the “LOA”) to the selected bidder requiring, inter alia, the execution of this Contract Agreement for the Project at ………. (location).

D) The selected bidder has since promoted and incorporated the ____________ (the DCO) as a limited company under the Companies Act 1956, and has requested IRCTC to accept the Developer-cum-Operator as the entity which shall undertake and perform the obligations and exercise the rights of the selected bidder under the LOA, including the obligation to enter into this Contract Agreement pursuant to the LOA for executing the Project. The DCO has further represented to the effect that it has been promoted by the selected bidder for the purposes hereof.

1 Part in curly paranathesis to be modified as applicable
E) Vide its letter dated______________, IRCTC has agreed to the said request of the selected bidder / DCO, and has accordingly agreed to enter into this Contract Agreement with the DCO for execution of the Project on DBFOOT basis, on the terms and conditions set forth hereinafter.

NOW THEREFORE, in consideration of the mutual covenants herein contained, and of other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Parties hereto agree as follows.
Part I: Preliminary

1. DEFINITIONS AND INTERPRETATION

1.1 Definitions

In this Agreement, the following words and expressions shall, unless repugnant to the context or meaning thereof, have the meaning hereinafter respectively assigned to them:

“Adjusted Equity” means the Equity funded in Indian Rupees and adjusted on the first day of the current month (the “Reference Date”), in the manner set forth below, to reflect the change in its value on account of depreciation and variations in WPI, and for any Reference Date occurring:

(a) On or before COD, the Adjusted Equity shall be a sum equal to the Equity funded in Indian Rupees and expended on the Project, revised to the extent of one half of the variation in WPI occurring between the first day of the month of commencement Date and the Reference Date;

(b) from COD and until the 4th (fourth) anniversary thereof, an amount equal to the Adjusted Equity as on COD shall be deemed to be the base (the “Base Adjusted Equity”) and the Adjusted Equity hereunder shall be a sum equal to the Base Adjusted Equity, revised at the commencement of each month following COD to the extent of variation in WPI occurring between COD and the Reference Date;

(c) After the 4th (fourth) anniversary of COD, the Adjusted Equity hereunder shall be a sum equal to the Base Adjusted Equity, reduced by 0.49% (zero point four nine per cent) thereof at the commencement of each month following the 4th (fourth) anniversary of COD and the amount so arrived at shall be revised to the extent of variation in WPI occurring between COD and the Reference Date;

For the purpose of calculation of Adjusted Equity, the Equity shall be considered at lower of Actual Equity or 30% of Total Project Cost.

For the avoidance of doubt, the Adjusted Equity shall, in the event of Termination, be computed as on the Reference Date immediately preceding the Transfer Date; provided that no reduction in the Adjusted Equity shall be made for a period equal to the duration, if any, for which the Contract Period is extended, but the revision on account of WPI shall continue to be made;

“Agreement” or “Contract Agreement” means (a) this Agreement including its Recitals, the Schedules, Annexures, any amendments thereto; (b) Tender Document dated……….and the amendments, if any, thereto; (c) the bid documents submitted by the DCO (Bidder) in response to the Tender Documents; , and (d) the LOA issued by IRCTC dated……….and any amendments thereto;
“Applicable Laws” means all laws, promulgated or brought into force and effect by Government Of India (GOI) or respective state Governments in which the Project is coming up including regulations, rules, directions, bye-laws, notifications, ordinances and judgments having force of law, or any final interpretation by a Court of Law having jurisdiction over the matter in question as may be in force and effect during the subsistence of this Agreement;

“Applicable Permits” means all clearance, permits, authorizations, consents, no-objections, licenses, approvals, registrations and exemptions required to be obtained or maintained under Applicable Laws and rules thereunder in connection with the design, engineering, financing, procurement, construction, operation and maintenance of the Project and provision of Services during the subsistence of this Agreement;

“Associates” means in relation to selected bidder {and/or Consortium Members}, a person who controls, is controlled by, or is under the common control with such Party {or Consortium Member}. As used in this definition, the expression “control” means with respect to a person which is a corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person, whether by operation of law or by contract or otherwise;

“Bank” means any scheduled bank incorporated in India;

“Bank of Baroda Base Rate” means the base rate per annum as fixed from time to time by the Bank of Baroda, and in the absence of such rate, the average of the base rates fixed by the State Bank of India and the Bank of India and failing that any other arrangement that substitutes such base rate as mutually agreed between the Parties;

“Bid” means the documents in their entirety comprised in the bid submitted by the {selected bidder/consortium} in response to the Request for Proposal in accordance with the provisions thereof;

“Bid Security” means the security provided by the {selected bidder /consortium} to IRCTC along with the Bid for the sum of Rs........lakh$^2$ (Rupees............. Only) in accordance with the Request for Proposal and which is to remain in force until substituted by the Performance Security;

“Capacity” means the capacity of the plant as specified in Schedule B;

“COD” means the commercial operations date of the Project and shall be the date on which the IRCTC / Independent Engineer and Auditor has issued the final completion certificate certifying Project Completion in accordance with this Agreement;

“CFA & Transportation Services” means services towards clearing & forwarding and
transportation services related to distribution of packaged drinking water and such services as listed in Clause 11.3.5;

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2 Bid Security being 5 lakh for Rs PDW Plant as per clause 2.20 of FRP/Tender Document
“Change in Ownership” means a transfer of the direct and/or indirect legal or beneficial ownership of any shares, or securities convertible into shares, that causes the aggregate holding of the {selected bidder/ Consortium Members}, together with {its/their} Associates, in the total Equity to decline below 100% (hundred per cent) thereof during Construction Period and five years thereafter; and that the aggregate holding of the {selected bidder/ Consortium Members whose experience has been evaluated}, together with {its/their} Associates, in the total Equity to decline below 51% (fifty one percent) after the fifth anniversary from COD; provided that any material variation (as compared to the representations made by the DCO during the bidding process for the purposes of meeting the minimum conditions of eligibility or for evaluation of its application or Bid, as the case may be,) in the proportion of the equity holding of {the selected bidder/ any Consortium Member} to the total Equity, shall constitute Change in Ownership;

“Company” means the Company acting as the Developer-cum-Operator under this Agreement and mentioned as the second party to this Agreement;

“Commencement Date” as defined in Clause10.2.3;

“Completion Certificate” means the Certificate issued by the Independent Engineer & Auditor pursuant to Clause10.8;

“Contract” shall have the meaning ascribed thereto in Article3;

“Contract period” means the period starting on the Commencement Date and ending on the at the end of 10 years and 8 months from the Commencement Date or on Termination Date, if its earlier;

“Consortium” means the consortium consisting of (i)________________________,(ii), , (iii)________________________and (iv)______________________________ formed and registered as company under companies Act 1956/ acting pursuant to the Joint Bidding Agreement dated_____________entered into by them, for the purpose of submitting their proposal for undertaking the Project and in the event of their being accepted by IRCTC to implement the Project through the Special Purpose Vehicle formed and incorporated by them in India;

“Construction Period” means the period beginning from the Commencement Date and ending on the COD;

“Construction Works or Works” means all works and things necessary to complete the Project thereof in accordance with this Agreement;

“Contractor” means the person or persons, as the case may be, with whom the DCO has entered into any of the EPC Contract, the O&M Contract or any other agreement or a material contract for construction, operation and/or maintenance of the Project or matters incidental thereto, but does not include a person who has entered into an agreement for providing financial assistance to the DCO;

“Cure Period” means the period specified in this Agreement for curing any breach or default
of any provision of this Agreement by the Party responsible for such breach or default and shall:

(a) Commence from the date on which a notice is delivered by one Party to the other Party asking the latter to cure the breach or default specified in such notice;
(b) Not relieve any Party from liability to pay Damages or compensation under the provisions of this Agreement; and
(c) Not in any way be extended by any period of Suspension under this Agreement; provided that if cure of any breach by the DCO required any reasonable action by the DCO that must be approved by IRCTC or the Independent Engineer hereunder, the applicable Cure Period shall be extended by the period taken by IRCTC or the Independent Engineer to accord their approval;

“DCO Default” shall have the meaning set forth in Clause 17.1;

“Damages” shall have the meaning ascribed thereto in Clause 1.2.1(q);

“Designated Bank Account” means such account of the DCO in a Bank identified for the purpose of receipt of all the payment from IRCTC;

“Debt Due” means the aggregate of the following sums expressed in Indian Rupees outstanding on the Termination Date:

(a) The principal amount of debt provided by the Lenders under the Financing Agreements for financing the Total Project Cost (the “principal”) but excluding any part of the principal that had fallen due for repayment two years prior to the Transfer Date;
(b) All accrued interest, financing fees and charges payable under the Financing Agreements on, or in respect of, the debt referred to in sub-clause (a) above till the Termination Date but excluding (i) any interest, fees or charges that had fallen due one year prior to the Termination Date, (ii) any penal interest or charges payable under the Financing Agreements to the Lenders and (iii) any pre-payment charges in relation to accelerated repayment of debt except where such charges have arisen due to IRCTC Default;

“Departmental Units” means retail outlets of IRCTC at premises of Indian Railways or elsewhere;

“Developer-cum-Operator” or “DCO” shall have the meaning attributed thereto in the array of Parties hereinabove as set forth in the Recitals;

“Dispute” shall have the meaning set forth in Clause 22.1;

“Dispute Resolution Mechanism” means the procedure for Dispute resolution set forth in Article 22;

“Document” or “Documentation” means documentation printed or in written form or in electronic storage devices like tapes, discs, drawings, computer programmes, written reports, photographs, films, cassettes, or expressed in any other written, electronic, audio or visual
form;

“Drawings” means all the drawings, calculations and documents pertaining to the Project as per the set Standards and Specifications to be submitted by the DCO as per the Agreement and shall include “as built” drawings of the Project;

“DBFOOT” means Design, Build, Finance, Own, Operate and Transfer basis of Public Private Partnership;

“EPC Contract” means contract or contracts entered into by the DCO with one or more contractors for the design, engineering, procurement of materials and equipment, construction and completion of the Project in accordance with the provisions of this Agreement;

“Emergency” means a condition or situation that is likely to endanger the security of the individuals on or about the Project including users thereof or which poses an immediate threat of material damage to any of the Project Assets and the Food Grain stock stored in the PDW Plant;

“Encumbrances” means, in relation to Project Assets, any encumbrances such as mortgage, charge, pledge, lien, hypothecation, attachment, security interest, assignment, privilege or priority of any kind having the effect of security or other such obligations and shall include without limitation any designation of loss payees or beneficiaries or any similar arrangement under any insurance policy pertaining to the Project;

“Equity” means the sum expressed in Indian Rupees representing the paid up equity share capital of the DCO, for meeting the equity component of the Total Project Cost, and shall for the purposes of this Agreement including convertible instruments or other similar forms of capital, which shall compulsorily convert into equity share capital of the Company, and any interest free funds advanced by any shareholder of the Company for meeting such equity component;

“Financial Close” means the fulfilment of all conditions precedent to the initial availability of funds under the Financing Documents;

“Financing Documents” means the documents executed by the DCO in respect of financial assistance to be provided by the Lenders by way of loans, guarantees, subscription to non-convertible debentures and other debt instruments including loan agreements, guarantees, notes, debentures, bonds and other debt instruments, security agreements, and other documents relating to the Financing (including refinancing) of the Project and includes amendments or modifications;

“Financial Year” means the year starting from 1 April of year and ending on 31st March of the succeeding year;

“Force Majeure” or “Force Majeure Event” shall mean an act, event, condition or occurrence specified in Article 16;
“GOI” means the Government of India;

“Good Industry Practice” means those practices, methods, techniques, designs, standards, skills, diligence, efficiency, reliability which are generally and reasonably expected of and accepted internationally from a reasonably skilled and experienced operator engaged in the similar type of undertaking as envisaged under this Agreement and acting in accordance with the Applicable Laws and would mean good engineering practices in the design, engineering, construction and Project management and which would be expected to result in the performance of its obligations by the DCO and in the operation and maintenance of the Project in accordance with this Agreement, Applicable Laws, Applicable Permits, reliability, safety, environment protection, economy and efficiency;

“Government, Government Agency / Instrumentality” means GOI, State Governments or any ministry, department, commission, board, instrumentality or agency, under the control of GOI or state Governments having jurisdiction over all or any part of the Project or the performance of all or any of the services or obligations of the DCO under or pursuant to this Agreement;

“Insurance Cover” means the aggregate of the maximum sums insured under the insurances taken out by the DCO pursuant to Article 15, and includes all insurances required to be taken out by the DCO under Clause 15.1 but not actually taken, and when used in the context of any act or event, it shall mean the aggregate of the maximum sums insured and payable or deemed to be insured and payable in relation to such act or event;

“Indemnifying Party” means the Party obligated to indemnify the other Party pursuant to Article 21;

“Indirect Political Event” shall have the meaning ascribed thereto in Clause 16.3;

“IRCTC Default” shall have the meaning set forth in Clause 17.2;

“IRCTC Representative” means such person or persons as may be authorised in writing by IRCTC to act on its behalf under this Agreement and shall include any person or persons having IRCTC to exercise any rights or perform and fulfil any obligations of IRCTC under this Agreement;

“Letter of Award” means the letter of award referred in Recital (C);

“Lead Member” shall have the meaning set forth in Recital (B)

“Letter of Commencement” shall have the meaning prescribed to it in Clause 10.2.3;

“Licensee Units” means such non-IRCTC owned retail outlets, both static and mobile units, on railway premises and on Indian Railways trains to which IRCTC sells its products and shall also mean all other retail outlets to which IRCTC may sell its PDW product at a future date;

“Manufacturing Services” means all manufacturing and bottling of packaged drinking
water and such related services as listed in Clause 5.1.3.c).

“Material Adverse Effect” means a major adverse action or event that will affect adversely materially the ability of either Party to perform any of its obligations under and in accordance with the provisions of this Agreement and which act or event causes a material financial burden or loss to either Party;

“Material Breach” means a breach by either Party of any of its obligation in this Agreement which shall be deemed to have a Material Adverse Effect;

“Non Political Event” shall have the meaning ascribed thereto in Clause 16.2;

“Operation & Maintenance or O&M” means the operation and maintenance of the Project during the Operation Period as per stipulated standards and provision of Services and includes but is not limited to functions of maintenance and performance of other services incidental thereto in terms of this Agreement;

“Operation Period” means the period commencing from the date of issue of Completion Certificate and ending at end of Termination of the Contract;

“Packaged Drinking Water” or “PDW” means drinking water prepared through a purification process comprising of reverse osmosis or superior technology and packaged in PET bottles such as to meet at all times the quality requirement as per BIS specification IS 14543: 2004, as periodically revised or replaced by the Bureau of Indian Standards and Food Safety and Standards Rules as applicable and all other such quality requirements stipulated by relevant Government Agencies and as per other stipulation mentioned herein.

“Parties” means the parties to this Agreement collectively and “Party” shall mean any of the parties to this Agreement individually;

“PDW Plant” means and includes the facility to be constructed under the Project and in terms of this Agreement and is inclusive of the reverse osmosis plant, PET blowing machine, automatic filling and labelling plant, warehouse, administrative office and all assets as further elaborated in Schedule-B required to provide Service to IRCTC under this Agreement

“Performance Standards” means the standards for performance during the Operation Period as stipulated in the agreement which should be adhered to by the DCO;

“Performance Security” shall have the meaning ascribed in the Article 9;

“Political Event” shall have the meaning ascribed thereto in Clause 16.4;

“Project” means the development, design, construction, financing, procurement, engineering, operation and maintenance of PDW Plant in accordance with the provision of this Agreement and shall include all incidental and auxiliary works and services relating to or in respect of the Project and also referred to as ‘PDW Plant’;
“Project Agreements” means this Agreement, the Engineering, Procurement and Construction (EPC) Contract, if any, the O&M Contract, if any, and any other agreements or contracts entered into by the DCO with IRCTC or others relating to the Project during the subsistence of this Agreement;

“Project Assets” means all physical and other assets relating to and forming part of the Project including but not limited to (i) rights over the Site in the form of license, lease, ownership, right of way or otherwise, (ii) tangible assets such as civil works including the foundation, sheet metal silo, conveyor system, drainage works, rail siding, lighting facilities, mechanical handling equipment, weighing equipment, electrical installations, DG sets, telephone and other communication systems and equipments for the Project, (iii) Project Facilities situated on the Site including office (iv) the rights of the DCO under the Project Agreements, (v) financial assets, such as security deposits for electricity supply, telephone etc. (vi) insurance proceeds and (vii) Applicable Permits and authorizations relating to or in respect of the Project;

“Project Completion” shall imply the completion of Construction Works related to the Project;

“Project Facilities” means all the amenities and facilities situated on the Site, including as per capacity requirements specified in Schedule-B;

“Project Location” means the location as specified in the Letter of Award referred to in the Recital (C);

“Rs.” Or “Rupees” Or “INR” means the lawful currency of the Republic of India;

“Scheduled Commercial Operation Date” or “SCOD” shall mean the 27th day from the Commencement Date;

“Services” means those Manufacturing, CFA and Transportation Services to be performed by the DCO under this Agreement;

“Site” means the parcel of land owned or Licensed by the Indian Railways and provided under a License Agreement for the Project;

“Specified Stations” means such locations where such specific railway stations or other premises of Indian Railways where Licensee units / Departmental Units which are customers of PDW product of IRCTC and shall mean all such locations where IRCTC intends to sell its products. The initial list of Specified Stations is mentioned as Schedule C.

“Standards and Specifications” means the standards and specifications relating to the quality, quantity, capacity and other requirements for the Project as set forth in Schedule E: Standards & Specifications” and any modifications thereof, or additions as included in the design and engineering for the Project submitted by the DCO to and expressly approved by IRCTC;

“Statutory Auditors” means firm of Chartered Accountants duly licensed to practice in India acting as independent statutory auditors of the DCO under the provisions of the
Companies Act, 1956 including any statutory modification or re-enactment or replacement thereof, for the time being in force and duly appointed by the DCO;

“Taxes” means any Indian statutory taxes and duties charged, levied or imposed on the goods, materials, equipment and services incorporated in and forming part of the Project, on the construction, operation and maintenance thereof and on the Project Assets, but excluding any taxes and duties on corporate income and any interest, penalties and other sums in relation thereto imposed on any account whatsoever;

“Transfer Date” means the date on which this Agreement and the Contract hereunder expires pursuant to the provisions of this Agreement or is terminated pursuant to a Termination Notice;

“Tender Document” shall have the meaning ascribed to it in the Recital ‘B’;

“Termination” means the expiry by efflux of time or termination of this Agreement and the Contract hereunder;

“Termination Notice” means the communication issued in accordance with this Agreement by one Party to the other Party terminating this Agreement;

“Termination Payment” means the amount payable by the Authority to the Contractor upon Termination and may consist of payments on account of and restricted to the Debt Due and Adjusted Equity, as the case may be, which form part of the Total Project Cost in accordance with the provisions of this Agreement;

“Tests” mean the tests to be carried out to determine the Project Completion and its certification by the Independent Engineer and Auditor for commencement of commercial operation of the Project;

“Total Project Cost” means the lowest of the following:

(i) A sum of {Rs ________ Crores};

24 actual capital cost of the Project upon completion of the Project as certified by the Statutory Auditors; or

25 Total Project cost as set forth in Financing Documents;

Any expression not defined above shall have the meaning as defined or described under the appropriate provisions of the Agreement;

1.2 Interpretation

25.1 In this Agreement, unless the context otherwise requires,

25.2 Any reference to any legislation or any provision thereof shall include amendment or re - enactment or consolidation of such legislation or any provision thereof so far as such amendment or re-enactment or consolidation applies or is capable of applying to any
transaction entered into hereunder;

25.3 References to Indian law shall include the laws, acts, ordinances, rules, regulations, or bye laws which have the force of law in any State or Union Territory forming part of the Union of India;

25.4 References to a ‘person’ and words denoting a natural person shall be construed as a reference to any individual, firm, company, corporation, society, trust, government, state or agency of a state or any association or partnership (whether or not having separate legal personality) of two or more of the above and shall include successors and assigns;

25.5 The words importing singular shall include plural and vice versa, and words denoting natural persons shall include consortiums, partnerships, firms, companies, corporations, joint ventures, trusts, associations, organizations or other entities (whether or not having a separate legal entity);

25.6 The table of contents, headings or sub-headings in this Agreement are for convenience of reference only and shall not be used in and shall not affect the construction or interpretation of this Agreement;

25.7 Terms and words beginning with capital letters and defined in the Agreement shall have the meaning ascribed thereto herein and the terms and words defined in the Schedules and used therein shall have the meaning ascribed thereto in the Schedules;

25.8 The words “include” and “including” are to the construed without limitation and shall be deemed to be followed by “without limitation” or “but not limited to” whether or not they are followed by such phrases;

25.9 References to “constructions” or “building” include, unless the context otherwise requires, investigation, design, engineering, procurement, delivery, transportation, installation, processing, fabrication, testing, commissioning and other activities incidental and auxiliary to the construction and ‘construct’ shall be construed accordingly;

25.10 Any reference to any period of time shall mean a reference to that according to Indian Standard Time;

25.11 Any reference to day shall mean a reference to a calendar day;

25.12 Any reference to month shall mean a reference to a calendar month as per Gregorian calendar;

25.13 The Schedules and Annexures to this agreement from an integral part of this Agreement and will be in full force and effect as though they were expressly set out in the body of this Agreement;

25.14 Any reference at any time to any agreement, deed, instrument, license or document of any description shall be construed as reference to that agreement, deed, instrument, license or other document as amended, varied, supplemented, modified or suspended at the time of such reference provided that this clause shall not operate so as to increase liabilities or obligations of IRCTC hereunder or pursuant hereto in any manner whatsoever;

25.15 References to Recitals, Articles, Clauses, Sub-clauses, Paragraphs, or Schedules in this Agreement shall, except where the context otherwise requires, be deemed to be references to Recitals, Articles, Clauses, Sub-clauses, paragraphs, and Schedules of or to this Agreement;

25.16 Any agreement, consent, approval, authorization, notice, communication, information or report required under or pursuant to this Agreement from or by any Party or the Independent Engineer and Auditor shall be valid and effectual only if it is in writing under the hands of duly authorised representative of such Party or the Independent Engineer and Auditor, as the case may be, in this behalf and not otherwise;

25.17 any reference to any period commencing “from” a specified day or date and “till” or
“until” a specified day or date shall include both such days or dates; provided that if the last day of any period computed under this Agreement is not a business day, then the period shall run until the end of the next business day;

25.18 The damages payable by either Party to the other as set forth in this Agreement, whether on per diem basis or otherwise, are mutually agreed genuine pre-estimated loss and damage likely to be suffered and incurred by the Party entitled to receive the same and are not by way of penalty (the “Damages”);

25.19 Wherever IRCTC occurs, it includes, for the limited purpose of use of storage facility of the PDW Plant, its nominees being its licencees or agents (Nominee); and

25.20 “lakh” means a hundred thousand (100,000) and ‘crore’ means ten million (10,000,000).

1.3 Measurement and arithmetic conventions

All measurements and calculations shall be in metric system and calculations done to 2 decimal places, with the third digit of 5 or above being rounded up and below 5 being rounded down.

1.4 Priority of Contract Document and errors/discrepancies

1.4.1 The several documents forming this agreement are taken as mutually explanatory to one another and, unless otherwise expressly provided elsewhere in this Agreement, the priority of the following documents shall in the event of any conflict between them be in the order they are set out:

(a) This Agreement;
(b) All other documents forming part of this Agreement.

1.4.2 In case of ambiguities or discrepancies within this Agreement the following shall apply:

(a) Between two or more Clauses of this Agreement, the provisions of the specific clause relevant to the issue under consideration shall prevail over those in other Clauses;
(b) Between the Clauses and the Schedules, the Clauses shall prevail save as otherwise expressly set forth in Clause 1.4.1;
(c) Between the written description on the Drawings and the Standards and Specifications, the latter shall prevail;
(d) Between the dimension scaled from the Drawing and its specific written dimension, the latter shall prevail;
(e) Between any value written in numerals and that in words, the latter shall prevail.

3 Estimated Project Cost as indicated in the RFP
Part II: The Contract

2. SCOPE OF PROJECT

2.1 Scope of the Project

2.1.1 The Project shall be executed on the Site, which is described in Schedule-A of this Agreement. The scope of the Project shall include:

(a) Construction of a fully automatic packaged drinking water plant for production and supply of packaged drinking water (PDW) in PET bottles exclusively to IRCTC. For this purpose, fund to the tune Rs. 8 crore is provided by IRCTC;
(b) Operation and Maintenance of the packaged drinking water plant as per BIS Standard and FSSAI Act for a period of 10 years.
(c) Provision of CFA and Transportation Services for distribution of packaged drinking water from PDW Plant to the Specified Stations; and
(d) Performance and fulfillment of all other obligation in accordance with the Contract Agreement to be entered into for the purpose.
(e) IRCTC has already procured land from State Government/ State Industrial Corporations at Mandideep Phase-II, Sanand-II, Bhuswal & Jagi Road (near Guwahati) and are in process of procurement of Land at Mallavalli (near Vijaywada), Patratu (near Ranchi) & Maneri (near Jabalpur). Rail Neer Plant thus set up will be owned by IRCTC and all licenses/Clearances will be in the name of IRCTC. DCO will be operating & maintaining the plant to manufacture Rail Neer and will be required to pay administrative/right to operate and maintain charges of Rs. 40 lakh plus applicable taxes to IRCTC for each plant for 1st year operation which will be payable at the time of commencement of the commercial production of the Rail Neer. In subsequent years, this will be payable at the beginning of each operational year with an increase of 7% annually. In case of late payment, an interest @12 % per annum will be charged.

3. GRANT OF CONTRACT

25.21 The Contract

25.21.1 Subject to and in accordance with the terms and conditions set forth in this Agreement, the Applicable Laws and the Applicable Limits, IRCTC hereby grants to the Developer-cum-Operator (DCO) the contract set forth herein, including the exclusive right and IRCTC during the subsistence of this Agreement to implement the Project (the “Contract”) for a period of 10 years and 8 months (Ten Years and eight months) in which 8 months will be construction period and ten years will be operation period starting from the Commencement Date and the DCO hereby accepts the Contract and agrees to implement the Project subject to and in accordance with the terms and conditions set forth herein. Period of operation will be 10 (ten) years irrespective of construction period.

25.21.2 Subject to and in accordance with the terms and conditions set forth in this Agreement, the Contract hereby granted shall entitle or oblige the DCO to:
(a) Right of Way and access to the Site for the purpose of and to the extent conferred by the provisions of this Agreement;
(b) Construct the Project;
(c) Manage, operate and maintain the Project;
(d) Perform and fulfill all of the DCO’s obligations under and in accordance with this Agreement;
(e) Bear and pay all costs, expenses and charges in connection with or incidental to the performance of the obligations of the DCO under this Agreement; and
(f) Neither assign, transfer or sublet or create any lien or Encumbrance on this Agreement, or the Contract hereby granted or on the whole or any part of the PDW Plant or Land nor transfer, lease or part possession thereof, save and except as expressly permitted by this Agreement or the Substitution Agreement.

4. CONDITIONS PRECEDENT

4.1 Conditions Precedent (CP)

4.1.1 Save and except as expressly provided in the Agreement in Articles 4, 9, 14,16,22 or 23 unless the context otherwise requires, the respective rights and obligations of the Parties under this Agreement shall be subject to the satisfaction in full of the conditions precedent specified in this Clause 4.1 (the “Conditions Precedent”).

4.1.2 IRCTC shall, upon receipt of the Performance Security from the DCO in accordance with Article 9, at any time within 30 (Thirty) days from date of this Agreement shall fulfill the following conditions:

(a) Procured for the DCO rights to the Site in accordance with provisions of Clause 10.1;
(b) If applicable, procured from the Indian Railways necessary NOC to carry out the activities of manufacturing, bottling and distribution of packaged drinking water from the Site.

4.1.3 The DCO shall within 30 (Thirty) days from the date of this Agreement fulfill the following conditions:

(a) Provided Performance Security to IRCTC;
(b) Procured all Applicable Permits;
(c) Delivered to IRCTC a confirmation from {the Consortium Members, their respective}, in original, of the correctness of their representations and warranties set forth in Sub clauses (k), (l) and (m) of clause 7.1 of this Agreement; and
(d) Delivered to IRCTC a legal opinion from the legal counsel of the DCO with respect to the authority to enter into this Agreement and the enforceability of the provisions thereof:
   Provided that upon request in writing by the DCO, IRCTC may, in its discretion, waive any of the Conditions Precedent set forth in this Clause 4.1.3. For the avoidance of doubt, IRCTC may, in its sole discretion, grant any waiver hereunder with such conditions as it may deem fit.

4.1.4 Each Party shall make all reasonable endeavors to satisfy the Conditions Precedent within the time stipulated and shall provide the other Party with such reasonable cooperation as may be required to assist that Party in satisfying the Conditions Precedent for which that
Party is responsible.

4.2 Damages for Delay

4.2.1 In the event, a Party does not procure the fulfillment of any or all or the Conditions Precedent as applicable to the Party under Clause 4.1.2 or 4.1.3, and the delay has not occurred due to breach of Agreement by other Party or due to Force Majeure Event, the said Party shall be deemed to be in breach of this Agreement and required to pay as Damages to the other Party at the rate of 0.5% (zero point five percent) of Capital Support (i.e. Rs. 8 crore) per week and part thereof for delay, subject to a maximum of 10% (ten percent) of Capital Support.

4.2.2 In the event the procurement or the fulfilment of any or all the Condition Precedent is delayed by a Party beyond 100 (hundred) days beyond the stipulated time, and the delay has not occurred due to breach of Agreement by other Party or due to Force Majeure Event, the Affected Party may, at its discretion, and without prejudice to its other rights and remedies under this Agreement, terminate this Agreement.

5 OBLIGATIONS OF THE DCO

5.1 Obligations of the DCO

5.1.1 Subject to and on the terms and conditions of this Agreement, the DCO shall, at its own cost and expense, procure finance for and undertake the design, engineering, procurement, construction, operation and maintenance of the PDW plant as per specified Standards and provide CFA and Transportation Services to IRCTC, on an exclusive basis, as per the terms of the Agreement herein.

5.1.2 Subject to the provisions of Clause 5.1.1, the DCO shall discharge its obligations in accordance with Good Industry Practice and as a reasonable and prudent person.

5.1.3 The DCO shall, at its own cost and expense, in addition to and not in derogation of its obligations elsewhere set out in this Agreement:

(a) At its own cost and expense, procure finance for and undertake the design, engineering, procurement of equipment and material, installation, construction, operation and maintenance of the packaged drinking water plant as per laid down technical specifications;

(b) Make, or cause to be made, necessary applications to the relevant Government Instrumentalities for Applicable Permits in favour of IRCTC and obtain and keep in force and affect such Applicable Permits, licenses. All statutory payments will be made by IRCTC

(c) During Operation Period, for manufacturing, of PDW, at its cost:

25.21.2.1.1 Source all raw materials, consumables and labour as per technical specifications provided by IRCTC. Raw water wherever required to be taken from govt./other agency for the purpose of making PDW, the cost of water at rates prevalent has to be borne by the DCO at all times. Similarly, any cess/taxes/charges levied by Govt./any other agency on ground water wherever applicable will be borne by the DCO.
25.21.2.1.1.2 Production of PDW, as per Quarterly Demand Estimates, adjusted as per Advance Notice of Revision, provided by IRCTC and meeting the specified quality requirements on exclusive basis for IRCTC;

25.21.2.1.1.3 Packaging of PDW as per requirements specified by IRCTC;

25.21.2.1.1.4 Stocking of PDW at Plant site for a minimum finished goods stock equivalent to 45,000 cartons of 12 bottles each (1 litre capacity), as per instructions of IRCTC in this regard;

25.21.2.1.1.5 Loading of PDW consignments on trucks for onward delivery; and

25.21.2.1.1.6 Comply with all the requirements under Applicable Laws and Applicable Permits.

(d) **During Operation Period, for CFA and Transportation Services, at its cost:**

i) Appointment of CFA & Transportation Agent (“Agent”) for provision of CFA & Transportation services for PDW from the Plant, unless the DCO is itself qualified to carry out the same activities; provided that the appointment of Agent shall not absolve the DCO from responsibility for provision of CFA & Transportation Services in any manner whatsoever;

ii) Ensure delivery of minimum pre-specified quantities of PDW, in good state, as per Quarterly Demand Estimate, revised by Advance Notice of Revision, to Licensee Units and Departmental Units at Specified Stations, as per Quarterly Demand Estimate amended through Advance Notice of Revision. Compliance with laid down requirements shall rest with the DCO;

iii) Maintaining warehouses at a location in proximity of Specified Stations, with capacity not less than 1 week of Annual Sales at the Specified location;

iv) Maintain at least one registered warehouse in each state in case of projects where interstate sales are required as mentioned in the Annual Demand Estimate provided by IRCTC

v) Maintaining minimum stock of PDW at the warehouse as specified by IRCTC from time to time;

vi) Directly or through Agent issue invoice to Licensee Units and collect signed and stamped copy of the invoice from the Licensee Unit. Invoicing to be done by the DCO or its Agent in the invoice books/challans provided by IRCTC or through the software provided by IRCTC;

vii) Provide to IRCTC, at regular periods as specified by IRCTC, copy of invoice duly signed and stamped by Licensee Units;

viii) Directly or through the Agent issue Stock Transfer Note (STN) to Departmental Units and collect and stamped copy of the STN from the Departmental Units. STN to be issued from STN book/challans provided by IRCTC or through the software provided by IRCTC;

ix) Provide to IRCTC, at regular periods as specified by IRCTC, the signed and stamped copy of STN. STN to be issued by the DCO or its Agent in the STN books/challans provided by IRCTC or through the software
x) Directly or through the Agent make collections from Licensee Units at Specified Stations. All collections made shall be deposited with IRCTC or in the bank account of IRCTC within the 7 (seven) calendar days of collection failing which an interest @18 % per annum will be charged. Daily report of collection and deposit to be provided to IRCTC by the end of the subsequent business day.

xi) Bear any loss / damage to goods that arises during the loading, transit, storage, unloading and transfer to Licensee/Department Units. DCO shall maintain adequate insurance cover at its cost to cover such losses, however based upon report of IRCTC representative(s) in field, reimbursement of damaged stock can be considered up to 0.1% (Zero point one percent) of stock dispatched from plant.

xii) Ensuring that its Agent have requisite permissions and necessary licenses and have complied with necessary formalities such as the possession of a license under the Shops and Establishments Act, Prevention of Food Adulteration / Essential Commodities Act etc to carry out all the activities;

xiii) Ensure compliance to all statutory requirements under various labour laws such as Motor Transport Workers Act, Minimum Wages Act etc; contract labour (Regulation & Abolition) Act 1970.

xiv) Procure required documentation from IRCTC before lifting of each consignment of PDW as required under the GST rules of the respective states. DCO shall be responsible for getting the goods cleared at any check posts and for release of any consignment seized by Sales Tax department;

xv) Complying with all the rules and regulations as applicable for distribution, transportation, warehousing and related activities; and

xvi) Bring to the notice of IRCTC or its agent issues of non-release of payment, non-receipt of consignment and other cases of non-cooperation at the Licensee Unit and/or Departmental Units; and

xvii) Employ personnel, directly or indirectly, at the Specified Stations to collect orders, supervise operations, collect payments from Licensee Units, co-ordinate with IRCTC personnel and carry out related activities.

e) Maintain the PDW Plant in reasonable state and in confirmation with the stipulations;
f) Comply with all Applicable Laws and Applicable Permits;
g) Perform and fulfill its obligations under the Financial Arrangements;
h) Make reasonable efforts to maintain harmony and good industrial relations;
i) Support, cooperate with and facilitate IRCTC in the implementation and operation of the Project in accordance with the provisions of this Agreement;
j) Maintain proper records and books of accounts relating to expenditure towards the construction, operation and maintenance of the packaged drinking water plant, PDW supplied to IRCTC, receipts from IRCTC and other receipts and provide to IRCTC information as stipulated herein;
k) Maintain plant log sheets, performance reports, equipment history, power consumption register, inventory registers, laboratory test reports and other...
necessary documentation for inspection by IRCTC;

l) Make available the facility for periodic inspection by designated quality control personnel of IRCTC, representatives of IRCTC or other authorized representatives;
m) At its cost, maintain insurance cover as required and prudent;
n) At its cost, pay all taxes, duties and levies incidental to provision of manufacturing Services and CFA & Transportation Services in conformity with schedule D[Price schedule] of this agreement;
o) Transfer the PDW plant upon Termination of the Contract or expiry of the Contract in accordance with the provisions herein;
p) Neither assign, transfer or sublet or create any lien or encumbrance on this Agreement, or the Contract hereby granted or on the whole or part of asset nor transfer, lease or part possession thereof, save and except as expressly permitted under the terms herein; and
q) At the end of the Contract Period, transfer the plant and machinery and operations of the PDW plant to IRCTC.

5.2 Obligations relating to Project Agreements

5.2.1 It is expressly agreed that the DCO shall, at all times, be responsible and liable for all its obligations under this Agreement notwithstanding anything contained in the Project Agreements or any other agreement, and no default under any Project Agreement or agreement shall excuse the DCO from its obligations or liability hereunder.

5.2.2 Upon demand from IRCTC at any time during the Contract Period to furnish the drafts and/or copies of Project Agreements any amendments or replacements thereto. It is further agreed that no review and/or observation of IRCTC and/or its failure to review and/or convey its observations on any document shall relieve the DCO of its obligations and liabilities under this Agreement in any manner nor shall IRCTC be liable for the same in any manner whatsoever.

5.2.3 The DCO shall not make any addition, replacement or amendments to any of the Financing Documents without the prior written consent of IRCTC if such addition, replacement or amendment has, or may have, the effect of imposing or increasing any financial liability or obligation on IRCTC, and in the event that any replacement or amendment is made without such consent, the DCO shall not enforce such replacement or amendment nor permit enforcement thereof against IRCTC. For the avoidance of doubt, IRCTC acknowledges and agrees that it shall not unreasonably withhold its consent for restructuring or rescheduling of the debt of the DCO.

5.2.4 In case IRCTC wishes to produce/source the preform or any other raw material at a future date, IRCTC reserves the right to supply the preforms or any such raw material to the DCO at prevailing market rates.

5.3 Obligations relating to Change in Ownership

5.3.1 The DCO shall not undertake or permit any Change in Ownership, except with the prior approval of IRCTC.

5.3.2 Notwithstanding anything to the contrary contained in this Agreement, the DCO agrees and acknowledges that:
(a) All acquisitions of Equity by an acquirer, either by himself or with any person acting in concert, directly or indirectly, including by transfer of the direct or indirect legal or beneficial ownership or control of any Equity, in aggregate of not less than 15% (fifteen per cent) of the total Equity of the DCO; or

(b) Acquisition of any control directly or indirectly of the Board of Directors of the DCO by any person either by himself or together with any person or persons acting in concert with him shall constitute a Change in Ownership requiring prior approval of IRCTC from national security and public interest perspective, the decision of IRCTC in this behalf being final, conclusive and binding on the DCO, and undertakes that it shall not give effect to any such acquisition of Equity or control of the Board of Directors of the DCO without such prior approval of IRCTC. For the avoidance of doubt, it is expressly agreed that approval of IRCTC hereunder shall be limited to national security and public interest perspective, and IRCTC shall endeavour to convey its decision thereon expeditiously. It is also agreed that IRCTC shall not be liable in any manner on account of grant or otherwise of such approval and that such approval or denial thereof shall not in any manner absolve the DCO from any liability or obligation under this Agreement. For the purposes of this Clause 5.3.2:

I. The expression “acquirer”, “control” and “person acting in concert” shall have the meaning ascribed thereto in the Securities and Exchange Board of India (Substantial Acquisition of Shares and Takeover) Regulations, 1997 or any statutory re-enactment thereof as in force as on the date of acquisition of Equity, or the control of the Board of Directors, as the case may be, of the DCO;

II. The indirect transfer or control of legal or beneficial ownership of Equity shall mean transfer of the direct or indirect beneficial ownership or control of any company or companies whether in India or abroad which results in the acquirer acquiring control over the shares or voting rights of shares of the DCO; and

III. Power to appoint, whether by contract or by virtue of control or acquisition of shares of any company holding directly or through one or more companies (whether situate in India or abroad) the Equity of the DCO, not less than half of the directors on the Board of Directors of the DCO or of any company, directly or indirectly whether situate in India or abroad, having ultimate control of not less than 15% (fifteen per cent) of the Equity of the DCO shall constitute acquisition of control, directly or indirectly, of the Board of Directors of the DCO.

5.4 Employment of trained personnel

The DCO shall ensure that the personnel engaged by it or its contractors or agents in the performance of its obligations under this Agreement are at all times properly trained for their respective functions.

5.5 Sole purpose of the DCO
5.5.1 Subject to the condition specified herein, the DCO having been set up for the sole purpose of exercising the rights and observing and performing its obligations and liabilities under this Agreement, the DCO shall not be or become directly or indirectly engaged, concerned or interested in any business other than as envisaged herein. However, the DCO is allowed to enter into one or more similar Agreements with IRCTC for any other project listed under the RFQ/RFP under which the DCO being the bidder was selected for such other Project (s).

5.6 Liability for Personnel

5.6.1 Labour:

(a) The DCO shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution of the Contract Agreement.

(b) The DCO shall at all times during the progress of the Agreement use its best endeavours to prevent any unlawful, riotous or disorderly conduct or behaviour by or amongst its employees & labour and labour of its Sub- Vendors / Contractors.

(c) The DCO shall, in all dealings with its labour and the labour of its Sub-Vendors employed on or connected with the Agreement, pay due regard to the laws and regulations pertaining to the employment of labour.

5.6.2 Labour Rules:

(a) In respect of all labour directly or indirectly employed on the works by the DCO, the DCO shall comply with and implement all the Provisions of the Contract Labour (Regulation and Abolition) Act 1970, or any amendment thereof, and all legislation and Rules of the State and / or Central Government or other local authority formed from time to time governing the protection of health, sanitary arrangements, wages, welfare and safety of labour employed on the works and the DCO shall be deemed to the Principal IRCTC for this purpose. The rules and other statutory obligations with regard to fair wages, welfare and safety measures, maintenance of register, etc. will be deemed to be part of the Agreement. The DCO will get it registered with the concerned statutory authorities as provided in the Act and shall be directly responsible to the authorities there under for compliance with the provisions thereof.

(b) Provision of Minimum Wages Act and Payment of Wages:

(c) The DCO shall comply with the provisions and procedures of Central Govt. / State Government’s minimum wages Act 1948 & Central Govt. / State Government’s Minimum Wages Fixation Act. 1962 and rules made there under in respect of all employees employed by the DCO or its Sub-Vendor(s) directly or indirectly for the purpose of carrying out the works. The DCO shall pay employees wages not less than the minimum rates of wages, if any, fixed by Central Govt. or State Government, whichever is higher, from time to time.

(d) In respect of labour employed by the DCO or its Sub-Vendor(s) on the works the DCO shall provide at its own cost reasonable amenities for securing proper working and living condition such as water supply, lavatories, bathing place, cleanliness, etc.
Where woman labour is employed, the DCO will provide lavatories separately for female workers as well as crèches for the infant children of women labourers. The DCO free of charges shall provide labourer’s engaged on hazardous jobs and occupations, with necessary safety appliances.

(e) The DCO’s / Sub-Vendors establishment will be subject to inspection, investigation, etc., by the IRCTC or its representative for assuring proper and faithful compliance of the provisions of the Agreement by the DCO (so with regard to the implementations of labour laws & other matters anticipated herein. The DCO / Sub-Vendors shall abide by the decisions and orders of the IRCTC with regard to any such matter and furnish information if required, for necessary compliance.

(f) In the event of retrenchment of workers by the DCO or Sub-Vendors employed by the DCO during or after the completion of facilities the DCO will pay the retrenchment compensation and other benefits to the workers as per the Industrial Dispute Act.

(g) If any money shall, as a result of any claim of application made under the said acts, be directed to be paid by the IRCTC, such money shall be deemed to be money payable to the IRCTC by the DCO and / or failure by the DCO to repay the IRCTC, and money paid by the IRCTC as aforesaid, latest within 30 days after the same shall have been demanded from the DCO, the IRCTC shall be entitled to recover the same from any money due or accruing to the DCO under this or any other Agreement with the IRCTC, failing which such amount shall be considered as debt due from the DCO to the IRCTC.

(h) The DCO shall comply with the provisions of by-partite and tripartite agreement entered into by the IRCTC from time to time with Labour Union and/ or the circulars issued by the IRCTC regarding payment of minimum wages and other benefits whichever applicable.

(i) The DCO shall strictly comply the statutory rules and regulations in respect of working hours of female labourer’s at site.

5.6.3. Reporting of Accidents:

(a) The DCO shall be responsible for the safety of its own and its Vendors’ workmen and employees. All accidents at site are to be immediately reported to the required authorities. The DCO shall be responsible for all such accidents.

5.6.4. Provision of Workmen’s Compensation Act:

(a) The DCO shall be liable in respect of any damages or compensation payable by law in respect of or in consequence of any accident or injury to any workmen or other person in the employment of the DCO or any of its Sub - Vendors and the DCO shall save harmless and shall indemnify and keep indemnified the IRCTC against all such damages and compensation and against all claims, demands, proceedings, costs, charges and expenses, whatsoever, in respect thereof or in relation thereto. The DCO shall at all times indemnify and keep indemnified the IRCTC against all claims for compensation under the provisions of the Workmen’s Compensation Act 1923 (VIII of 1923) or any other law for the time being in forces by or in respect of any workmen employed by the DCO or its Sub-DCOs/agencies in carrying out the Agreement and against all costs and expenses or penalties incurred by the IRCTC in connection therewith. In every
case in which by virtue of the provisions of Section-12, Sub-Section (1) of the Workmen’s Compensation Act 1923, the IRCTC is obliged to pay compensation to a workmen employed by the DCO or its Sub-DCOs/agencies, the amount of compensation so paid and without prejudice to the rights of the IRCTC under Section-12, Sub-Section (2) of the said Act, the IRCTC shall be at liberty to recover such amount or any part thereof from the security deposit or from the sums due or to become due to the DCO (whether under this Agreement or any other Agreement).

(b) The IRCTC shall not be bound to contest any claim made against him under Section-12, Sub-Section (1) of the said Act, except on the written request of the same or his Sub-Vendors / agencies and upon their giving to the IRCTC full security for all costs for which the IRCTC might become liable in consequence of contesting such claims.

5.6.5 Provisions of Apprentices Act:

(a) The DCO shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If DCO fails to do so, his failure may be treated as breach of the Agreement and the IRCTC may, in its discretion, terminate the Agreement. The DCO shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

5.6.6 Labour Returns:

The DCO shall, if required by the IRCTC, submit periodical statements of labour employed by the DCO in the Performa prescribed by the IRCTC from time to time.

5.6.7 Labour Camps:

The DCO shall, at its own expense, make adequate arrangements for housing, electricity, road, supply of drinking water and provision of lavatories and urinals for its staff and labour, disposal of sewerage and sludge and for temporary crèche (bal mandir) where 50 or more women are employed at a time.

5.6.8 Preservation of Peace:

The DCO shall take requisite precautions and use its best endeavour to prevent riotous or unlawful behaviour by, or amongst his workmen and/or others employed on the works, by the DCO its Sub-Vendors and for the preservation of peace and protection of the inhabitants and security of the property in the neighbourhood of the works/site. In the event of the IRCTC requiring the maintenance of a special police force at or in the vicinity of the site during the tenure of the Agreement in consequence of the riotous or unlawful behaviour by, or amongst the DCO’s or its Sub-Vendors workmen and/or others employed by the DCO/Sub-Vendors, all expenses thereof and costs of all damages due to such riotous or unlawful behaviour shall be borne by the DCO and if paid by the IRCTC, shall be recoverable from the DCO from any money due or that may become due to the DCO by the IRCTC.
5.6.9 Payment of Wages:

(a) The DCO shall make regular and prompt payment of wages to the labour engaged in the work and in no case should the payment be delayed more than seven days following the period for which the wages are due. The DCO shall send a certificate to the IRCTC to this effect every month. If it is found that workers are not paid regularly, the Agreement is liable to be terminated.

(b) The IRCTC shall have the right to enquire into and decide against any complaint alleging that the wages paid by the DCO to any labour for the work done by such labour is less than the wages paid for similar work in the neighborhood.

(c) As a number of DCOs may be working at the same time in the erection of different parts of the Facilities, there is need for pursuance of a coordinated policy in regard to employment, wages and other conditions of work. The DCO shall consult the IRCTC on all such matters to arrive at mutually agreed settlements.

5.6.10 Sanitary Arrangements:

The DCO shall comply with all sanitary rules in force and carry out all sanitary measures and permit inspection of all sanitary arrangements at all reasonable times by the IRCTC and or Statutory Authorities.

5.6.11 Infectious Diseases:

(a) The DCO shall employ such persons as are found to be free of contagious diseases and shall produce if required by the IRCTC, certificate of fitness of all his employees working at site. The DCO shall, if required by the IRCTC, subject all its employees to regular medical check-up and produce satisfactory evidence of their being free from any contagious disease.

(b) The DCO shall remove from its labour camp such labour and their families who refuse protective inoculations and vaccination when called upon to do so by any competent authority.

5.6.12 Medical Facilities at Site:

The DCO shall provide medical facilities at the site as per rules in force in relation to the strength of the DCO’s staff and workmen deployed at site.

5.6.13 Use of Intoxicants:

The use or sale of ardent spirits or other intoxicating beverages, upon the works or in any of the building, boarding houses, encampments or other tenements owned, occupied by or within the control of the DCO or any of its employees or its Sub-Vendors is strictly forbidden and the DCO shall secure strict compliance.

5.6.14 Age Limits of Labour:
The DCO shall not employ for the purpose of the work, any person below the age as is statutorily forbidden. The IRCTC shall have the right to refuse to allow any labour, which the IRCTC considers to be under age to be employed by the DCO. The DCO shall submit periodical statements of labour employed by the DCO to the IRCTC.

5.6.15 Provident Fund:

(a) The DCO shall be solely responsible for deduction and contributions under the Employees Provident Fund and Family Pension Act, 1952 and the scheme made there under as amended from time to time. The DCO shall be solely responsible for the maintenance of records for payment of contributions and submission of returns in accordance with the said act and scheme.

(b) In case the DCO fails to make payments under the above Act and the scheme made there under and as amended from time to time, the IRCTC reserves the right to make such payment on behalf of the DCO on demand from the authorities under the Act and recover the same from the payments due to the DCO. Further, the DCO shall indemnify and keep indemnified the IRCTC against any loss or damage whatsoever that may be suffered by the IRCTC as a result of any claims, damages, penalties for any failure, non-compliance on his part with the provisions of the aforesaid Act and the scheme framed there under.

5.7 IRCTC may ask DCO for manufacturing of any other packaging size of packaged drinking water within existing facility with minor modification/change parts. Ex plant manufacturing rate of the product shall be decided on mutually agreed terms. The rate of 500 ml bottle has been stipulated in the clause -14.1.3

5.8 The Capital cost for major modification, expansion beyond present scope of work will be borne by IRCTC. Ex plant manufacturing rate of new product shall be decided on mutually agreed terms.

6. OBLIGATIONS OF IRCTC

25.22 Obligations of IRCTC

25.22.1 IRCTC shall, at its own cost and expense undertakes, comply with and perform all its obligations set out in this Agreement or arising hereunder.

25.22.2 IRCTC agrees to provide support to the DCO and undertakes to observe, comply with and perform, subject to and in accordance with the provisions of this Agreement and the Applicable Laws, the following:

(a) Procure the Site, free of encumbrances, for the PDW Plant under license from Indian Railways/any other agency and handover the same for design, engineering, procurement, construction, operation and maintenance of the PDW plant to the DCO for the period of the contract;

(b) Upon request from the DCO, provide reasonable support to the DCO in procuring Applicable Permits. However, non-rendering of any support by IRCTC shall not absolve the DCO of its obligation to obtain all Applicable Permits;

(c) Ensure that no unreasonable barrier is created at the site preventing the DCO in
carrying out its tasks under the terms herein;
(d) Ensure timely release of dues to the DCO on performance of the obligation as per the term herein;
(e) Support, cooperate with and facilitate to a reasonable extent the DCO in the implementation and operation of the PDW plant in accordance with the provisions of this Agreement; and
(f) Support, cooperate with and facilitate to a reasonable extent for CFA and Transportation Activities.

26 REPRESENTATIONS AND WARRANTIES

7.1 Representation and warranties of the DCO

7.1.1 The DCO represents and warrants to IRCTC that:

(a) It is duly organised and validly existing under the laws of India, and has full power and authority to execute and perform its obligations under this Agreement and to carry out the transactions contemplated hereby;
(b) It has taken all necessary actions under Applicable Laws to authorise the execution and delivery of this Agreement and to validly exercise its rights and perform its obligations under this Agreement;
(c) It has the financial standing and capacity to undertake the Project in accordance with the terms of this Agreement;
(d) This Agreement constitutes its legal, valid and binding obligation, enforceable against it in accordance with the terms hereof, and its obligations under this Agreement will be legally valid, binding and enforceable obligations against it in accordance with the terms hereof;
(e) it is subject to the laws of India, and hereby expressly and irrevocably waives any immunity in any jurisdiction in respect of this Agreement or matters arising there under including any obligation, liability or responsibility hereunder;
(f) The information furnished in the Bid and as updated on or before the date of this Agreement is true and accurate in all respects as on the date of this Agreement;
(g) The execution, delivery and performance of this Agreement will not conflict with, result in the breach of, constitute a default under, or accelerate performance required by any of the terms of its {Memorandum and Articles of Association or those of any member of the Consortium} or any Applicable Laws or any covenant, contract, agreement, arrangement, understanding, decree or order to which it is a party or by which it or any of its properties or assets is bound or affected;
(h) There are no actions, suits, proceedings, or investigations pending or, to its knowledge, threatened against it at law or in equity before any court or before any other judicial, quasi-judicial or other authority the outcome of which may result in the breach of this Agreement or which individually or in the aggregate may result in any material impairment of its ability to perform any of its obligations under this Agreement;
(i) It has no knowledge of any violation or default with respect to any order, writ, injunction or decree of any court or any legally binding order of any Government Instrumentality which may result in any material adverse effect on its ability to perform its obligations under this Agreement and no fact or circumstance exists which may give rise to such proceedings that would adversely affect the performance of its obligations under this
Agreement;

(j) It has complied with Applicable Laws in all material respects and has not been subject to any fines, penalties, injunctive relief or any other civil or criminal liabilities which in the aggregate have or may have a material adverse effect on its ability to perform its obligations under this Agreement;

(k) It shall at no time undertake or permit any Change in Ownership except in accordance with the provisions of Clause 5.3 and that the {selected bidder / Consortium Members}, together with {its/their} Associates,

I. hold not less than 100% (hundred percent) of its issued and paid up Equity as on the date of this Agreement and for a period till 5 (years) from COD; and that no member of the Consortium whose technical and financial capacity was evaluated for the purposes of pre-qualification and short-listing in response to the Request for Qualification shall hold less than 26% (twenty six per cent) of such Equity for the period till 5 years from COD and

II. that the {selected bidder / Consortium Members}, together with {its/their} Associates shall continue to hold not less than 51% (fifty one percent) {and that the Lead Member of the Consortium shall continue to hold not less than 26% (twenty six percent)} during the balance Operation Period;

(l) {the selected bidder/Consortium Members and its/their} Associates have the financial standing and resources to fund the required Equity and to raise the debt necessary for undertaking and implementing the Project in accordance with this Agreement;

(m) {the selected bidder / each Consortium Member} is duly organised and validly existing under the laws of the jurisdiction of its incorporation, and has requested IRCTC to enter into this Agreement with the DCO pursuant to the Letter of Award, and has agreed to and unconditionally accepted the terms and conditions set forth in this Agreement;

(n) no representation or warranty by it contained herein or in any other document furnished by it to IRCTC or to any Government Instrumentality in relation to Applicable Permits contains or will contain any untrue or misleading statement of material fact or omits or will omit to state a material fact necessary to make such representation or warranty not misleading;

(o) no sums, in cash or kind, have been paid or will be paid, by it or on its behalf, to any person by way of fees, commission or otherwise for securing the Contract or entering into this Agreement or for influencing or attempting to influence any officer or employee of IRCTC in connection therewith; and

(p) all information provided by the DCO being selected bidder/Consortium Members} in response to the Request for Qualification and Request for Proposals or otherwise, is to the best of its knowledge and belief, true and accurate in all material respects.

7.2 Representations and warranties of IRCTC

7.2.1 IRCTC represents and warrants to the DCO that:

(a) It has full power to execute, deliver and perform its obligations under this Agreement and to carry out the transactions contemplated herein and that it has taken all actions necessary to execute this Agreement, exercise its rights and perform its obligations, under this
Agreement;
(b) It has taken all necessary actions under the Applicable Laws to authorise the execution, delivery and performance of this Agreement;
(c) It has the financial standing and capacity to perform its obligations under this Agreement;
(d) this Agreement constitutes a legal, valid and binding obligation enforceable against it in accordance with the terms hereof;
(e) It has no knowledge of any violation or default with respect to any order, writ, injunction or any decree of any court or any legally binding order of any Government Instrumentality which may result in any material adverse effect on IRCTC’s ability to perform its obligations under this Agreement; and
(f) It has complied with Applicable Laws in all material respects.

7.3 Disclosure

In the event that any occurrence or circumstance comes to the attention of either Party that renders any of its aforesaid representations or warranties untrue or incorrect, such Party shall immediately notify the other Party of the same. Such notification shall not have the effect of remedying any breach of the representation or warranty that has been found to be untrue or incorrect nor shall it adversely affect or waive any right, remedy or obligation of either Party under this Agreement.

4Part in curly brackets to be deleted if not applicable
8 DISCLAIMER

8.1 Disclaimer

8.1.1 The DCO acknowledges that prior to the execution of this Agreement, the DCO has, after a complete and careful examination, made an independent evaluation of the Request for Qualification, Request for Proposals, Scope of the Project, Standards and Specifications, Site, existing structures, local conditions, physical qualities of ground, subsoil and geology, accessibility of Site, feasibility of rail siding to the PDW Plant, water quality and availability and all information provided by IRCTC or obtained procured or gathered otherwise, and has determined to its satisfaction the accuracy or otherwise thereof and the nature and extent of difficulties, risks and hazards as are likely to arise or may be faced by it in the course of performance of its obligations hereunder. IRCTC makes no representation whatsoever, express, implicit or otherwise, regarding the accuracy, adequacy, correctness, reliability and/or completeness of any assessment, assumptions, statement or information provided by it and the DCO confirms that it shall have no claim whatsoever against IRCTC in this regard.

8.1.2 The DCO acknowledges and hereby accepts the risk of inadequacy, mistake or error in or relating to any of the matters set forth in Clause 8.1.1 above and hereby acknowledges and agrees that IRCTC shall not be liable for the same in any manner whatsoever to the DCO, [the Consortium Members and their] Associates or any person claiming through or under any of them.

8.1.3 The Parties agree that any mistake or error in or relating to any of the matters set forth in Clause 8.1.1 above shall not vitiate this Agreement, or render it voidable.

8.1.4 In the event that either Party becomes aware of any mistake or error relating to any of the matters set forth in Clause 8.1.1 above, that Party shall immediately notify the other Party, specifying the mistake or error; provided, however, that a failure on part of IRCTC to give any notice pursuant to this Clause 8.1.4 shall not prejudice the disclaimer of IRCTC contained in Clause 8.1.1 and shall not in any manner shift to IRCTC any risks assumed by the DCO pursuant to this Agreement.

8.1.5 Except as otherwise provided in this Agreement, all risks relating to the Project shall be borne by the DCO and IRCTC shall not be liable in any manner for such risks or the consequences thereof.
Part III: Project Implementation and Operations

9 PERFORMANCE SECURITY

9.1 Performance Security

9.1.1 The DCO shall, for the performance of its obligations hereunder during the Contract Period, no later than 30 (Thirty) days from the date of this Agreement, provide to IRCTC an irrevocable and unconditional guarantee from Scheduled Bank (the “Performance Security”). Until such time the Performance Security is provided by the DCO pursuant hereto and the same comes into effect, the Bid Security shall remain in force and effect, and upon such provision of the Performance Security pursuant hereto, IRCTC shall release the Bid Security to the DCO. The bank guarantee towards Performance Security provided shall have a validity of not less than 16 (sixteen) months. On receipt of the Performance Security as stipulated herein, IRCTC shall forthwith return the Bid Security, if not returned, to the DCO. The amount of the Performance Security shall be as follows:

(a) During the Construction Phase, for a sum equivalent to Rs 50 Lakh (Rupees Thirty Lakh) only. This BG can also be submitted by lead bidder; and

(b) During the Operation Period, for a sum equivalent to 4.5% of the value arrived at by multiplying maximum retail price (MRP) of 1 litre bottle of Rail Neer brand PDW, as prevailing at the start of the financial year, with the annual Capacity of the PDW Plant in litres. In the event Rail Neer is replaced, fully or partially, with other any other brand of IRCTC, such other brands shall be considered herein to the extent it replaces the Rail Neer brand.

9.1.2 Notwithstanding anything to the contrary contained in this Agreement, in the event Performance Security for the Construction Period is not provided by the DCO within the stipulated period from the date of the Agreement, IRCTC may encash the Bid Security and appropriate the proceeds thereof as Damages, and thereupon all rights, privileges, claims and entitlements of the DCO under or arising out of this Agreement shall be deemed to have been waived by, and to have ceased with the concurrence of the DCO, and this Agreement shall be deemed to have been terminated by mutual agreement of the Parties.

9.1.3 On or before the COD, the DCO shall provide fresh bank guarantee towards Performance Security to meet the criteria specified under Clause 9.1.1.b). Upon receipt of a fresh bank guarantee, under this clause, IRCTC shall within a period of 21 days return the first performance guarantee. The DCO shall, 45 (forty five) days prior to the expiry of validity of bank guarantee provided towards the Performance Security, replace the bank guarantee with a fresh bank Guarantee in similar form or extend the validity period of the bank guarantee for a period not less than 24 (twenty four) months. In the event the DCO fails to extend the validity or provide fresh Performance Security or maintain the Performance Security as per stipulations herein anytime during the
Contract Period, the same shall constitute a DCO Default and without prejudice to its other rights under this Agreement, IRCTC may at its discretion invoke the bank guarantee submitted with IRCTC provided towards Performance Security.

9.2 Appropriation of Performance Security

9.2.1 Upon the occurrence of a DCO Default or failure to meet any Condition Precedent, IRCTC shall, without prejudice to its other rights and remedies hereunder is entitled to in cash and appropriate the relevant amounts from the Performance Security as Damages for such DCO Default or failure to meet any Condition Precedent. Upon such encashment and appropriation of the Performance Security, IRCTC shall grant a period of 30 (thirty) days to the DCO to provide either a fresh Performance Security or replenish, through another guarantee, the part amount so encashed failing which IRCTC shall, notwithstanding anything contained in this Agreement relating to Termination, be entitled to Terminate this Agreement in accordance with Article 18.

9.3 Release of Performance Security

9.3.1 The Performance Security shall remain in force and effect from the date of the Agreement till 60 (sixty) days after the Termination Date except in the event of Termination of the Agreement due to DCO Default, wherein IRCTC shall forfeit the Performance Security. In the event of Termination upon IRCTC Default or Termination under Force Majeure, subject to deduction of dues payable to IRCTC including Damages and compensation, the Performance Security shall be returned within a period of 60 (sixty) days from the Termination Date.

10 PROJECT IMPLEMENTATION

10.1 Project Site

10.1.1 IRCTC shall arrange for the site for the Project for PDW Plant under long term lease of period not less than Contract Period from the Indian Railways or any other agency.
10.1.2 IRCTC shall charge administrative right to operate and maintain charges from the DCO as per the contract agreement entered between the IRCTC and DCO for the Project Site. The obligation of the DCO to pay above charges shall start from the date of commercial operation of the plant.
10.1.3 IRCTC shall ensure that the Project Site is vacant and free from encumbrances and encroachment. The DCO shall arrange infrastructure facilities including approach road, power supply, bore well and/ or associated pipe line for raw water, sewerage facility etc. IRCTC shall arrange for permission from Railway only, if required. In case of change of site after tender opening and before commencement date, IRCTC will initiate compensatory mechanism towards additional expenditure of road and electricity line on mutually agreed terms & conditions.
10.1.4 On or after the date of this Agreement, IRCTC and DCO shall jointly carry out test of the ground water with respect to its availability and quality. The DCO shall review the results
and provided it is satisfied, the DCO shall convey its satisfaction with the quality and availability of water. If the DCO is not satisfied, it shall convey, in writing the same to IRCTC in which case IRCTC can call for a second test at the cost of IRCTC. If in the opinion of the DCO the situation is a Water Force Majeure, it shall have the right to call for Termination under Clause 16.8.1.

10.1.5 After the issue of Letter of Award, IRCTC shall, on written request of the DCO, allow temporary access to DCO to carry out surveys and tests on the Site for the purpose of the design and engineering of the PDW Plant.

10.2 Obligations prior to commencement of construction

10.2.1 Upon signing of this Agreement, IRCTC shall provide reasonable access to the DCO to carry out surveys and such investigations as required, including those related to availability and quality of water at the Site.

10.2.2 Prior to the commencement of Construction Works, IRCTC and the DCO shall undertake and comply with all Condition Precedents as stipulated under Clause 4.1.3. Each Party shall satisfy that the Condition Precedent has been satisfactorily satisfied by the other Party.

10.2.3 Subject to Clause 4.2.2, upon satisfactory fulfillment of all Conditions Precedent by the DCO and itself, IRCTC shall issue a Letter of Commencement to the DCO to start the Construction Works on the Site. The date of the issue of Letter of Commencement shall be the Commencement Date.

10.3 Construction of Project

10.3.1 On receipt of the Letter of Commencement from IRCTC and on and after the Commencement Date, the DCO shall commence Construction Work for the PDW Plant as per the Construction Plan and in conformity with the Standards and Specifications and the Applicable Permits procured.

10.3.2 The DCO shall submit the Designs and Drawings along with the a construction plan specifying its construction methodology, procurement, engineering and construction plan, construction time schedule and quality assurance procedures (together “Construction Plan”) for the PDW Plant to the IRCTC complying with the laid down standards and all Applicable Permits procured by it. In the event the Engineer and/or IRCTC seeks clarifications and/or suggests modification, if any, to the Construction Plan, the DCO shall satisfy the Engineer and/or IRCTC on the issues raised, including making suitable modification in its Construction Plan as required.

10.3.3 The DCO shall complete the Construction Works within the period between the Commencement Date and the Scheduled Commercial Operation Date.

10.3.4 The design, procurement and construction of the PDW Plant undertaken by the DCO shall be in complete compliance with the laid down standards. The DCO shall be solely liable for compliance of all requirements related to the PDW Plant as per the Standards and Specifications.

10.3.5 The DCO shall undertake all necessary measures for the project implementation, including appointment of personnel, contractors, procurement of equipment and material and
procurement of permits and arrangement of finances in timely manner for carrying out the construction Work of the PDW Plant.

10.3.6 The design, installation and construction of the PDW Plant shall be in compliance with the applicable regulations and Good Industry Practice, including but not limited to regulations applicable to seismic zones, environment, fire and safety. The DCO shall be solely liable for compliance of such requirements. The DCO shall seek permission and approvals, as required, from respective Government Instrumentalities in these aspects.

10.3.7 The DCO shall take all safety measures required under Applicable Laws and as expected as per Good Industry Practice. The DCO shall be solely responsible for maintaining safety at the Project site.

10.3.8 IRCTC and/or Engineer shall have the right, but not the obligation, to review the submissions related to Construction Plan and other aspects related to the Construction Work of the PDW Plant and provide comments, if any. IRCTC and the Engineer shall endeavour to provide its observation and comments, if any, within a reasonable time so as not to adversely impact the project implementation schedule. The DCO, on its parts, should at least ensure that IRCTC and Engineer is provided a reasonable time, being not less than 14 working days, for review and response on its submissions. Such submissions shall not relieve or absolve the DCO of its obligations and liabilities hereunder in any manner whatsoever.

10.4 Appointment of Contractors

10.4.1 In order to fulfill the objectives of this Agreement, the DCO may appoint any person as Contractor, at its own cost and risk, for any works relating to the Construction Work and O&M of the Project; provided further such person(s) are capable of discharging the obligations under this Agreement for and on behalf of the DCO.

10.4.2 The DCO shall ensure that its obligations, which are relevant to the scope of work of a Contractor, pursuant to this Agreement are incorporated in the terms and conditions under which any Contractor is retained.

10.4.3 Prior to appointment of contractor for any substantial work, the DCO shall inform IRCTC of the appointment and the qualification of such contractors. IRCTC shall have the right, but not the obligation, to review the submissions related to the qualification of the contractors.

10.4.4 The appointment of Contractors shall not in any way relieve the DCO of its obligations as set out in this Agreement and IRCTC’s consent to the appointment of such Contractors shall not impose any obligation or liability whatsoever on IRCTC in this respect.

10.5 Fortnightly progress reports

During the Construction Period, the DCO shall, no later than 3 (three) days after the close of each fortnight, furnish to IRCTC and the Engineer a fortnightly report on progress of the Construction Works and shall promptly give such other relevant information as may be required by the Engineer.
10.6 Inspection

10.6.1 During the Construction Period, the Engineer shall inspect the Project at least once a month and make a report of such inspection (the “Inspection Report”) stating in reasonable detail the defects or deficiencies, if any, with particular reference to the Scope of the Project and Standards and Specifications. It shall send a copy of the Inspection Report to IRCTC and the DCO within 7 (seven) days of such inspection and upon receipt thereof, the DCO shall rectify and remedy the defects or deficiencies, if any, stated in the Inspection Report. Such inspection or submission of Inspection Report by the Engineer shall not relieve or absolve the DCO of its obligations and liabilities hereunder in any manner whatsoever.

10.7 Tests

10.7.1 For determining that the Construction Works conform to the standards, the Independent Engineer shall require the DCO to carry out or cause to be carried out tests, at such time and frequency and in such manner as may be specified by the Independent Engineer from time to time, in accordance with Good Industry Practice for quality assurance. The DCO shall, with due diligence, carry out or cause to be carried out all the tests in accordance with the instructions of the Independent Engineer and furnish the results thereof to the Engineer.

10.7.2 In the event that results of any tests conducted under this Clause 10.7.1 establish any defects or deficiencies in the Construction Works, the DCO shall carry out remedial measures and furnish a report to the Independent Engineer in this behalf.

10.8 Completion Certificate

10.8.1 At least 30 (thirty) days prior to the likely completion of the Project, the DCO shall notify the Engineer, with a copy to IRCTC for its information, of its intent to subject the PDW Plant to pre-commissioning tests. The date and time of each of the Tests shall be determined by the Engineering consultation with the DCO, and notified to IRCTC who may designate its representative to witness the Tests. The tests shall comprise test of quality of PDW, verification of capacities and confirmation with general standards.

10.8.2 Upon the DCO materially satisfactorily meeting the requirements of product quality, capacity and confirmation with standards, IRCTC shall issue to the DCO a certificate (“Completion Certificate”) for meeting the construction related requirements.

10.8.3 In the event, the DCO falls short on meeting certain requirements as per laid down standards which in the opinion of IRCTC / Engineer shall not affect the operations of the PDW plant, the Engineer / IRCTC shall not withhold the Completion Certificate provided the DCO assures to make good the shortfall within a reasonable time.

10.9 Entry into Commercial Service

10.9.1 The construction and development of the Project shall be deemed to be complete when the Completion Certificate is issued under the provisions of Clause 10.8.2, and accordingly the Commercial Operation Date (the “COD”) of the Project shall be the date on which such Completion Certificate is issued.
10.9.2 The obligations of the Parties relating to the Operation Period shall commence from the day of Commercial Operation Date.

10.10 **Damages due to delay in Project Completion**

10.10.1 Subject to any of the provisions of this Agreement providing excuse from performance, as the case may be, of any of the obligations of the DCO under this Agreement, including in case of occurrence of Force Majeure Event or due to material breach of the provisions of this Agreement by IRCTC, the DCO shall pay to IRCTC Damages at the rate of 0.25% (zero point two five percent) of the Performance Security for each day of delay in completion of the Project beyond the SCOD. The Parties agree that the Damages as provided is a genuine pre-estimate of the damages IRCTC is likely to suffer and is not by way of a penalty. In case the delay exceeds 180 (one hundred and eighty) days IRCTC shall be entitled to terminate this Agreement and the consequences of Termination as laid down in Article 18 shall apply.

10.11 **Bonus for early completion**

10.11.1 In the event the DCO achieves COD earlier than the SCOD, IRCTC shall pay a bonus of Rs. 2 Lakh per month or part thereof for early completion.

11 **OPERATION AND MAINTENANCE**

11.1 **Provision of manufacturing Services**

11.1.1 During the Operation Period, the DCO shall produce and bottle PDW at the PDW Plant exclusively for IRCTC or its assignees. The PDW shall be bottled in PET bottles in such sizes and shapes as specified by IRCTC on an ongoing basis. Each bottle shall be labeled using automatic labeling machine and plastic shrink-wrapped, or similarly packaged, in bundles as specified by IRCTC.

11.1.2 During the Operation Period, shall provide all Manufacturing Services as per stipulated under Clause 5.1.3.c) and other related obligations under this Agreement.

11.1.3 Within the PDW Plant, the DCO shall provide covered storage facility for maintaining stock of packaged PDW for a minimum of 45,000 cartons of 12 bottles each (1 litre capacity).

11.1.4 The PDW produced by the PDW shall at all times meet the water quality requirement as per BIS specification IS 14543: 2004, as periodically revised or replaced by the Bureau of Indian Standards and Food Safety and Standards Rules as stipulated by the Government and applicable on PDW.

11.1.5 The DCO shall at all times have a fully-staffed house lab at the PDW Plant to test water quality during each of the stages of water treatment and ensure that the final product complies to quality norms given in BIS specification IS 14543: 2004. DCO shall allow authorized person(s) of IRCTC free entrance at all times during the Operation Period and to carry out such quality tests as reasonably required to ascertain the quality of water.

11.1.6 The DCO shall produce such quantities of the PDW bottles shall be as per the
Quarterly Demand Estimate provided by IRCTC to the DCO, revised through Advance Notice of Revision in Quarterly Demand Estimate.

11.1.7 IRCTC shall provide to the DCO, 90 (ninety) days prior to the start of a Financial Year an Annual Estimate of Demand for the relevant Financial Year to enable the DCO to prepare its operational plans for the year. The Annual Estimate of Demand shall indicate a reasonable forecast of the expected sales in the coming financial year and shall cover the following aspects:

(a) Total expected sales for each quarter of the Financial Year;
(b) Specified Stations and their lead distance from PDW Plant;
(c) Total expected sales at each Specified Station;
(d) Sizes of PDW Bottles;
(e) Expected level of warehousing requirements in proximity of each Specified Station; and
(f) Any other relevant issue related to demand estimate for the upcoming Financial Year.

11.1.8 IRCTC shall provide the DCO, at least 30(thirty) days prior to start of a calendar quarter, a Quarterly Demand Estimate for the upcoming calendar quarter. Subject to Clause 11.1.9, the Quarterly Demand Estimate shall be the basis for production activities by the DCO at the PDW Plant. IRCTC shall take all reasonable steps to ensure that the level of variation between Annual Demand Estimate and Quarterly Demand Estimate is kept to minimum levels. The Quarterly Demand Estimates shall cover the following aspects for the upcoming calendar quarter, broken into reasonable smaller periods and with reasonable return:

(a) Total expected sales for upcoming quarter;
(b) Specified Stations and their lead distance from PDW Plant;
(c) Total expected sales at each Specified Station;
(d) Sizes of PDW Bottles;
(e) Frequency of supply at each Specified Station
(f) Expected level of warehousing requirements in proximity of each Specified Station; and
(g) Any other relevant issue related to demand estimate for the upcoming calendar quarter.

11.1.9 In case of unexpected variation in demand or disruption in sales, IRCTC may issue Advance Notice of Revision in Quarterly Demand (“Advance Notice of Revision”) at least 10 (ten) days prior to such requirement arising to revise the Quarterly Demand Estimate. IRCTC shall take all reasonable steps to ensure that such issuances are kept to a minimum. The Quarterly Demand Notice issued under Clause 11.1.8 shall stand revised as per the Advance Notice of Revision.

11.1.10 IRCTC shall take reasonable opinion of the DCO, the plant capacity and Assured Sales Levels into consideration while finalizing on the demand estimates prepared as Clauses 11.1.7, 11.1.8 and 11.1.9. It is mutually agreed that the notwithstanding the
demand estimates, IRCTC shall not make payments beyond the amounts stipulated in Article 14.

11.2 Maintenance requirements

11.2.1 The DCO shall procure that at all times during the Operation Period, the PDW Plant conforms to maintenance requirements set forth in the laid down Performance Standards, maintenance manual of machinery/equipment suppliers and in conformance with Good Industry Practice.

11.3 Provision of CFA and Transportation Services

11.3.1 At least 3 (three) months prior to the Schedule Commercial Operation Date (SCOD), the DCO shall appoint an Agency (“CFA & Transport Agent”) to carry out the works related to Clearing and Forwarding (C&F) and Transportation of the PDW from the PDW Plant to retail outlets at Specified Stations. The DCO shall ensure that the CFA & Transport Agent is properly qualified and registered as a Goods Transport Agent (GTA), has relevant experience, has adequate resources and financial standing to carry out the C&F and Transportation Services. The DCO may provide such services on its own provided it is qualified and registered as a GTA for doing so.

11.3.2 Prior to appointment of the CFA & Transport Agent, the DCO shall inform IRCTC of its intent to appoint a certain party as the CFA & Transport Agent and provide all such relevant details of its qualifications and experience. In case IRCTC is not satisfied with the same, IRCTC may at, its discretion, request in writing for a change stating relevant reasons for the same. The final decision of appointment of CFA & Transport Agent shall be with the DCO.

11.3.3 The DCO shall have the right to replace a CFA & Transport Agent with another subject to provisions of Clause 11.3.2.

11.3.4 Notwithstanding the appointment of CFA & Transport Agent, the DCO shall be solely responsible for the provision of the C&F and Transportation services to IRCTC for the production from the PDW plant in terms of this Agreement.

11.3.5 The DCO shall be responsible for the following CFA & Transportation Services for the entire Operation Period as laid down in Clause 5.1.3.d)and other related obligations under this Agreement.

11.3.6 The DCO shall have to bear any loss / damage to goods that arises during the loading, transit, storage, unloading and transfer to Licensee/Department Units. DCO shall maintain adequate insurance cover at its cost to cover such losses;

11.3.7 The DCO shall be responsible for compliance with all the rules and regulations as applicable for distribution, transportation, warehousing and related activities.

11.4 Damages payable in shortfall in compliance during Operation Period

11.4.1 Subject to Article 16, if during the Operation Period, the DCO fails to comply with the stipulated Quality requirements for PDW, apart from rejection of the whole consignment wherein samples have tested for less than stipulated quality, the DCO shall be required to pay to IRCTC as Damage sat the rate of to 15% (fifteen percent) of the sum of Manufacturing
Rate, CFA Rate and Transport Rate per bottle as applicable for the financial year in addition to compensation for the total number of bottles in the subject consignment in addition to compensation. In case of persistent shortfall in quality of PDW supplied by the DCO, IRCTC may terminate the Agreement as if it were a DCO Default. For clarity, IRCTC shall not be liable to pay any charges for such consignments which have failed Quality requirements. In addition to the damages payable by the DCO under this Clause, the DCO shall indemnify for all third party claims due to shortfall in quality of PDW.

11.4.2 Subject to Article 16, if during the Operation Period, the DCO fails to manufacture stipulated quantity of PDW as per Quarterly Demand Estimated, adjusted for Advance Notice of Revision, the DCO shall pay to IRCTC as Damages at the rate of to 10% of the sum of Manufacturing Rate, CFA Rate and Transport Rate per bottle as applicable for the financial year for the total shortfall. In case of persistent shortfall, IRCTC may terminate the Agreement as if it were a DCO Default. The shortfall shall be calculated on a quarterly basis and adjustments in payments made accordingly.

11.4.3 Subject to Article 16, if during the Operation Period, the DCO fails to provide CFA & Transportation Services as per the stipulated requirements, the DCO shall pay to IRCTC as Damages at the rate of to 10% of the sum of CFA Rate and Transport Rate per bottle as applicable for the financial year for the total shortfall. In case of persistent shortfall in level of CFA & Transportation Service provided by the DCO, IRCTC may, at its discretion, partially terminate the Agreement with respect to the CFA and Transportation Services (“Partial Termination”) or completely terminate as if it were a DCO Default. The shortfall shall be calculated on a quarterly basis and adjustments in payments made accordingly. In case of Partial Termination, IRCTC may award the CFA & Transportation Services to a third party selected by IRCTC to whom the DCO shall extend full co-operation.

11.5 Property right on the PDW and “Rail Neer” Brand

11.5.1 The ownership rights of the PDW shall be deemed to be transferred to IRCTC once the same has been dispatched from the plant after due tax-related processes and the DCO shall not create lien on the same.

11.5.2 The ownership right of the “Rail Neer” brand or any other brand of IRCTC shall at all times be with IRCTC and the DCO shall not commercially or otherwise exploit the brand.

11.6 On account of operational convenience IRCTC may take over the CFA and transport services from DCO.

12 MONITORING AND INSPECTION

12.1 Monitoring and Inspection

12.1.1 IRCTC’s representative or nominee and/or the Engineer shall periodically conduct quantity and quality test sat the PDW Plant, warehouses of the DCO or its agent and at point of sales ( Licensee Units, Departmental Units, others), examine the records and visit the PDW Plant including the Quality Lab and warehouses of the DCO or its agent

12.1.2 IRCTC may at its discretion deploy a team of its personnel or representatives or
nominees at the PDW Plant including the Quality Lab and warehouses of the DCO or its
agent on a permanent basis to carry out monitoring and inspection activities.

12.1.3 The DCO shall cooperate with IRCTC’s representative and provide reasonable facilities
including work space to carry out such monitoring and inspection activities. The DCO shall
ensure that similar facilities are extended by its agents.

12.1.4 The DCO, at its own cost, shall to provide IRCTC such information and records and
copies thereof, including quantity and quality related records, as may reasonably be
requested for by IRCTC during the course of such inspection.

12.2 Implementation of findings of IRCTC

12.2.1 Based on its inspection, IRCTC shall communicate to the DCO its findings. The DCO
shall discuss with IRCTC its findings and corrective steps required. Based on agreement on
the matter with IRCTC and the Engineer, the DCO shall take all such steps to correct the
deficiencies. Such submissions shall not relieve or absolve the DCO of its obligations and
liabilities under this Agreement in any manner whatsoever.

13 INDEPENDENT ENGINEER – Deleted

14 PAYMENT FOR SERVICES

14.1 Payment for Services

14.1.1 IRCTC shall make payments for Manufacturing and CFA and Transportation Services
provided by the DCO during the Operation Period under the terms of this Agreement. The
total payment to the DCO shall comprise of the following:-
(a) Payment for Manufacturing Services;
(b) Payment for CFA Services;
(c) Payment for Transportation Services;
(d) Volume shortfall payments.

14.1.2 All non-disputed payments shall be made within 30 days of the invoice being Submitted to
IRCTC. The payments as per Clauses 14.1.2 and 14.1.3 shall be made on a monthly basis
where as payments at Clause 14.1.6 shall be made on an annual basis not later than of 6 (six)
months from the close of the Financial Year.

14.1.3 Payment for Manufacturing Services: The total amount payable to the DCO by IRCTC
towards provision of Manufacturing Services as referred at Clause 14.1.1.a) shall be
calculated as following :

   a) (Total number 1 litre Bottles produced as per Standards & Specifications) X
      Manufacturing Rate per 1 litre bottle.
   
      Wherein
   - Total number of 1 Litre Bottles produced shall be accounted for based on tax-
     invoice produced by DCO and shall not include bottles rejected in quality tests
   - Manufacturing Rate shall be based on the bid of the DCO, adjusted as per Clause
14.2 for the relevant financial year on a Rs per 1 litre bottle basis
- In case of production of 500 ml bottles, the Manufacturing Rate shall be paid @80% of ex. plant cost of 1 litre bottle.

14.1.4 Payment for CFA Services: The total amount payable to the DCO by IRCTC towards CFA Services under this Agreement as referred to at Clause 14.1.1.b) shall be calculated sum of the following:

a) (Total number of 1 litre Bottles sold to Licensee Units) X (CFA Rate per 1 litre bottle); and

b) (Total number of 1 litre Bottles sold to Departmental Units) X (CFA Rate per 1 litre bottle)

Wherein
- Total no of 1 litre bottles sold to Licensee Units shall be calculated based on original tax-invoice signed by the authorized signatory of Licensee Unit made available to IRCTC
- Total no of 1 litre bottles sold to Departmental Units shall be calculated based on Stock Transfer Note signed by the authorized signatory of Department Unit made available to IRCTC in original
- CFA Rate shall be based on the bid of the DCO, adjusted as per Clause 14.2 for the relevant financial year on a Rs per 1 litre bottle basis
- In case unit size of bottles produced is different from 1 litre bottle, the CFA rate will be adjusted on a proportionate basis of volume of bottle

c) Payment for CFA & Transportation services: For supply of Rail Neer to Rajdhani/shatabadi and other premium trains run as departmental units or licensee units where sale proceeds is not collected by the agency, only 75% of the CFA rate will be paid.

14.1.5 Payment for Transportation Services: The total amount payable to the DCO by IRCTC towards Transportation Services under this Agreement as referred to at Clause 14.1.1.c) shall be calculated for each Specified Station and then summed up to arrive at the total payment under this clause. The payment towards Transportation Services for a Specified Station shall be calculated as following:

a) (Total number of 1 litre Bottles sold to Licensee Units and Department Units at the Specified Station) X (Lead Distance of the Specified Station minus 35 kms) X (Transport Rate per 1 litre bottle per km for the Specified Station)

Wherein
- Total no of 1 litre bottles sold to Licensee Units shall be calculated based on original tax-invoice signed by the authorized signatory of Licensee Unit made available to IRCTC
- Total no of 1 litre bottles sold to Departmental Units shall be calculated based on Stock Transfer Note signed by the authorized signatory of Department Unit made available to IRCTC in original
- Lead Distance of the Specified Station shall be the distance by road from the PDW Plant to the Specified Station as specified by IRCTC from time to time
- Transport Rate shall be as specified in the bid document, adjusted as per Clause 14.2 for the relevant financial year on a Rs. per litre bottle per km basis
- In case unit size of bottles produced is different from 1 litre bottle, the transportation rate will be adjusted on a proportionate basis of volume of bottle

14.1.6 In addition to the Clause 14.1.2 and 14.1.3, IRCTC shall make Volume Shortfall Payments to DCO for actual despatch in a year less than Assured despatch Levels. The payment, to be made on annual basis, under this clause shall be calculated as follows

a) Actual shortfall below Assured despatch Levels (in number of bottle) X (Shortfall Compensation per bottle).
b) The Shortfall Compensation shall be equal to 10 % of the Manufacturing Rate per Bottle as applicable for the Financial Year.
c) The Assured Sales Levels are as follows:
   26.1.1.1 50% of Capacity for the first Financial Year of Operation Period
   26.1.1.2 60% of Capacity for the second Financial Year of Operation Period, and
   26.1.1.3 70% of Capacity for the third Financial Year of Operation Period.

In the event the operation is for less than full Financial Year, the Assured Sales level shall be considered on a pro rata basis

14.1.7 **Penalty for lesser production**: The normal target per working day with one bottle blowing machine will be 72000 bottles per day. The plant will be working for 327 days in a calendar year. The slab wise penalty for lesser production as compared with target fixed by IRCTC on monthly basis will be levied as under:
   I. 95%- 100% - No penalty
   II. 90%-95% - @5% of manufacturing rate per bottle
   III. Below 90% - @10% of manufacturing rate per bottle

14.1.8 Bonus: The DCO will be paid bonus @ 5% of the manufacturing cost per bottle beyond production of 72000 bottle per day.

14.1.9 The payments payable under this Article 14 shall be the only payment made by IRCTC to the DCO towards provision of Services as per the terms of the Agreement.

14.2 **Variation of charges**

14.2.1 The Manufacturing Cost per 1 litre bottle (Ex plant) will remain unchanged for the first year of operation. From the second year of operation it shall be revised on quarterly basis (i.e. on 1\textsuperscript{st} of January, April, July & October) as per following formula:

\[ R_1 = \left( \frac{Ro}{100} \times [40 + 34\times (P_1/P_0)\times(W_1/W_0) + 4\times(C_1/C_0) + 2\times(B_1/B_0) + 6\times(S_1/S_0) + 7\times(L_1/L_0) + 7\times(F_1/F_0)] \right) \]

\[ R_1 = \text{Updated price} \]
R0 = Accepted price as mentioned in LOA (manufacturing cost Ex plant)  
P1 = Average of price of RELPET grade G5801 as on 15th of each month in the preceding quarter  
P0 = Price of RELPET Grade –G5801 as on 15th of proceeding tender opening month  
W1 = Revised weight of Preform in grams as specified by IRCTC from time to time  
W0 = Weight of Preform in grams as specified in the Schedule E of the Contract Agreement  
C1 = Average of price of HDPE Resin Grade-E52009 as on 15th of each month in the preceding quarter  
C0 = Base price of HDPE Resin Grade-E52009 as on 15th of proceeding tender opening month  
B1 = Average of price of BOPP Resin as on 15th of each month in the preceding quarter  
B0 = Base price of BOPP Resin as on 15th of proceeding tender opening month  
S1 = Average of price of LDPE Resin as on 15th of each month in the preceding quarter  
S0 = Base price of LDPE Resin as on 15th of proceeding tender opening month  
L1 = Average of All India Consumer Price Index for Industrial Labour during each month in the preceding quarter as per Labour Bureau, Ministry of Labour Website http://labourbureau.nic.in  
L0 = All India Consumer price index for Industrial Labour for tender opening month has per Labour Bureau Ministry of Labour website http://labourbureau.nic.in  
F1 = Average of WPI for Electricity for each month during the preceding quarter as per Economic Advisor Ministry of Industry website http://eaindustry.nic.in  
F0 = WPI for Electricity for tender opening month as per Economic Advisor Ministry of Industry website http://eaindustry.nic.in

14.2.2 The Cost of CFA per 1 Litre bottle will remain unchanged for the first two years of operation. From the third year of operation the CFA price would be revised on quarterly basis. The updated price would be calculated on the 1st working day of each quarter (i.e. on 1st of January, April, July & October) by the following formula:

For two years from COD: Updated price = Accepted price

Third year onwards: Updated price = \(\frac{\text{Accepted price}}{100} \times (30+50 \times \frac{L_1}{L_0})+20 \times \frac{D_1}{D_0}\)

Accepted price = Price as mentioned in LOA (Cost of CFA per bottle)

L1= Quarterly Average of minimum wages for unskilled labour applicable in that State where the plant is located for the preceding year.  
L0= Minimum wages for unskilled labour applicable in that State during the tender opening month  
D1=Average of price of HSD on the 15th of each month of the preceding quarter (PSU-Basic)
14.2.3 **Transportation cost per 1 litre bottle will remain unchanged for the first year of operation. From the second year of operation it shall be revised, on quarterly basis (i.e. on 1st of January, April, July & October) as per following formula:**

\[ \text{Updated price} = (\text{Accepted price}/100) \times [30 + 30 \times (\text{WPI}_1/\text{WPI}_0) + 40 \times (\text{D}_1/\text{D}_0)] \]

**Accepted price = Price as mentioned in LOA (Cost of transportation per bottle)**

\[ \text{D}_1 = \text{Average of price of HSD on the 15th of each month of the preceding quarter (PSU-Basic)} \]

\[ \text{D}_0 = \text{Price of HSD on the date of tender opening (PSU-Basic)} \]

\[ \text{WPI}_1 = \text{Three monthly average of overall Wholesale Price Index of quarter} \]

\[ \text{WPI}_0 = \text{Overall Wholesale Price Index for tender opening month} \]

**Note:** The price of HSD (High Speed Diesel) at Petrol pump in the state where plant is located to be Considered.

14.2.4 **Mid Term Price Review:** IRCTC reserves the right to review the base price and the price variation clause in the midterm of the contract applicable from the 5th year of commercial operations. The base price and the price variation clause would be reset on mutually agreeable basis to the DCO and IRCTC in order to reflect any major changes in usage of raw materials, cost structure, regulations, and other changes in the operational environment. IRCTC and the DCO may jointly commission a price review study by an independent agency in order to determine the applicable pricing structure.

14.2.5 In future, new activities such as production of pdw in other sizes, production of premium water, flavored water, fruit drinks etc. may also be introduced. In such case, the pricing will be on mutually agreed term.

14.3 **Invoices**

14.3.1 With effect from the COD, at the end of each calendar month, the DCO shall prepare and submit to IRCTC, separate invoices for Manufacturing and CFA & Transportation, for the PDW Plant with supporting calculations and documents and all the relevant details.

14.3.2 The DCO shall maintain, retain and store all relevant information along with the relevant records, bills, invoices and receipts with respect to Services performed under this Agreement. Upon request, the DCO shall provide all such information forthwith to IRCTC.

14.4 **Mode of Payment**

14.4.1 The DCO hereby expressly authorizes IRCTC to pay all the dues under this Article 14, including any reduction or adjustments, Termination Payment and any other payment which becomes payable by IRCTC to the DCO under this Agreement directly by the credit to the Designated Bank Account as per written declarations of the DCO. IRCTC shall to the
extent of the payment so made be relieved and discharged of all its obligations in respect of such payments under this Agreement.

14.5 **Disputed Invoices**

14.5.1 If, within 21 (twenty one) days of the submission of an invoice, IRCTC does not dispute in writing such invoice, it shall be considered as being accurate, final and binding and shall not be open to any dispute.

14.5.2 If the parties do not, within 30 (thirty) days, of the communication of dispute in writing, resolve any dispute arising under this clause, either Party may refer the matter for dispute resolution as set out in Article 22.

14.5.3 The non-payment of the disputed amount under this Clause 15.6 shall not amount to a breach by IRCTC under this Agreement.

14.6 **Right to set-off**

14.6.1 IRCTC retains the right to set-off any amount owed to it by the DCO under this Agreement which has fallen due and payable against any amount due to the DCO under this Agreement.

14.7 **Security Creation by DCO**

14.7.1 IRCTC shall allow creation of security creation by the DCO on the assets and its bank account under the Financing Documents, provided the same shall not increase the financial liabilities as contemplated by IRCTC under this Agreement.

14.8 **Change in Tax structure**

14.8.1 In the event there is a change in the structure of Taxes as applicable to the Project which leads to adverse financial impact of value greater than 5(five) percent of the revenue in a financial year, the Affected Party shall request for a change in the payment structure such that impact is reasonably mitigated. The other Party give reasonable consideration to the request of the Affected Party. In the event the Parties are unable to resolve the issue within a period of 180 (one hundred and eighty) days, the Affected Party shall have the right to ask for compensation from the other Party such that the adverse impact on the Affected Party is reasonably mitigated. In case of a dispute, the Affected Party has the right to Dispute Resolution Mechanism as per Article 22.

15 **INSURANCE**

15.1 **Insurance during Contract Period**

15.1.1 The DCO shall effect and maintain at its own cost, during the Contract Period, such insurance as may be required under the Financing Documents, and the Applicable Laws, and such insurances as may be necessary or prudent in accordance with Good
Industry Practice. The DCO shall also effect and maintain such insurances as may be necessary for mitigating the risks that may devolve on IRCTC as a consequence of any act or omission of the DCO during the Contract Period.

15.2 Evidence of Insurance Cover

15.2.1 The DCO shall furnish to IRCTC notarised copy of certificates of insurance policies procured by the DCO along with evidence of premia paid on such policies for the PDW Plant and the stock.

15.3 Remedy for failure to insure

15.3.1 If the DCO shall fail to effect and keep in force all insurances for which it is responsible pursuant hereto, IRCTC shall have the option to either keep in force any such insurances, and pay such premia and recover the costs thereof from the DCO, or in the event of computation of a Termination Payment, treat an amount equal to the Insurance Cover as deemed to have been received by the DCO.

15.4 Waiver of subrogation

15.4.1 All insurance policies in respect of the insurance obtained by the DCO pursuant to this Article 15 shall include a waiver of any and all rights of subrogation or recovery of the insurers there under against, inter alia, IRCTC, and its assigns, successors, undertakings and affiliates, employees, insurers and underwriters, and of any right of the insurers to any set-off or counterclaim or any other deduction, whether by attachment or otherwise, in respect of any liability of any such person insured under any such policy or in any way connected with any loss, liability or obligation covered by such policies of insurance.

15.5 DCO’s waiver

15.5.1 The DCO hereby further releases, assigns and waives any and all rights of subrogation or recovery against, inter alia, IRCTC and its assigns, undertakings and their subsidiaries, affiliates, employees, successors, insurers and underwriters, which the DCO may otherwise have or acquire in or from or in any way connected with any loss, liability or obligation covered by policies of insurance maintained or required to be maintained by the DCO pursuant to this Agreement (other than third party liability insurance policies) or because of deductible clauses in or inadequacy of limits of any such policies of insurance.
Part III: Force Majeure and Termination

16  FORCE MAJEURE

16.1 Force Majeure Event

16.1.1 As used in this Agreement, a Force Majeure Event shall mean occurrence in India of any or all of Non Political Event, Indirect Political Event and/or Political Event as defined in Clauses 16.2, 16.3 and 16.4 respectively hereinafter which prevent the Party claiming Force Majeure (the “Affected Party”) from performing its obligations under this Agreement and which act or event is (i) beyond the reasonable control and not arising out of the fault of the Affected Party, (ii) which are of incapacitating nature impairing the Affected Party’s ability to carry out its obligation under this Agreement, (iii) the Affected Party has been unable to overcome such act or event by the exercise of due diligence and reasonable efforts, skill and care, including through expenditure of reasonable sums of money and following good Industry practice and(iv) has a Material Adverse Effect on the Affected Party.

16.2 Non Political Force Majeure Events

16.2.1 For purposes of Clause 16.1, Non-Political Events shall mean one or more of the following acts or events:

(a) Acts of God or events beyond the reasonable control of the Affected Party which could not reasonably have been expected to occur, exceptionally adverse weather conditions, lightning, earthquake, cyclone, flood, volcanic eruption or fire to the extent originating from a source external to the Site or beyond design specifications for the Construction Works) or landslide;

(b) Radioactive contamination or ionizing radiation;

(c) Strikes or boycotts (other than those involving the DCO, Contractors or their respective employees/representatives or attributable to any act or omission of any of them) interrupting supplies and services to the Project for a period exceeding a continuous period of 21 (twenty one) days in a Financial Year, and not being an Indirect Indian Political Event set forth in Clause 16.3 hereof;

(d) Any failure or delay of a Contractor but only to the extent caused by another Non-Political Event and which does not result in any offsetting compensation being payable to the DCO by or on behalf of such Contractor;

(e) Any event or circumstance of a nature analogous to any of the foregoing;

(f) The discovery of geological conditions, toxic contamination or archaeological remains on the Site that could not reasonably have been expected to be discovered through a site inspection; and

(g) Drop in availability of ground water or contamination of ground water such that the same cannot be used for production of PDW after treatment in line with specification of BIS (“Water Force Majeure Event”).
16.3 **Indirect Political Force Majeure Events:**

16.3.1 For Purposes of Clause 16.1, Indirect Political Event shall mean one or more of the following acts or events:

(a) an act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage which prevents the Affected party from performing any of its obligations for a continuous period of not less than 21 (twenty one) days from the date of its occurrence.

(b) Industry wide or state wide or nationwide strikes or industrial action which prevent the Affected party from performing any of its obligations for a continuous period of not less than 21 (twenty one) days from the date of its occurrence; or

(c) Any civil commotion, boycott or political agitation which prevents the Affected Party from performing any of its obligations for an aggregate period exceeding 15 (fifteen) days in a Financial Year;

(d) Any failure or delay of a Contractor to the extent caused by any Indirect Political Event and which does not result in any offsetting compensation being payable to the DCO by or on behalf of such Contractor; or

(e) Any Indirect Political Event that causes a Non-Political Event; or

(f) Any event or circumstances of a nature analogous to any of the foregoing.

16.4 **Political Force Majeure Events**

16.4.1 For purposes of Clause 16.1, Political Event shall mean one or more of the following acts or events by or on account Government Of India (GOI), IRCTC, or any other Governmental Agency:

(a) Change of Law;
(b) Expropriation or compulsory acquisition by any Government, any agency of Project Assets or rights of the DCO or of the Contractors; or
(c) Unlawful or unauthorized or without jurisdiction revocation of, or refusal to renew or grant without valid cause any consent or approval required by the DCO or any of the Contractors to perform their respective obligations under the Project Agreement (other than a consent the obtaining of which is Condition Precedent) provided that such delay, modification, denial, refusal or revocation did not result from the DCO’s or any Contractor’s inability or failure to comply with any condition relating to grant, maintenance or renewal of such consents or permits.

(d) Any failure or delay of a Contractor but only to the extent caused by another Political Event and which does not result in any offsetting compensation being payable to the DCO by or on behalf of such Contractor;

(e) Cancellation of License on Project Site by Indian Railways or IRCTC; or

(f) Any event or circumstance of a nature analogous to any of the foregoing.
16.5 **Duty to Report:**

16.5.1 Upon occurrence of a Force Majeure Event, the Affected Party shall by notice report such occurrence to the other Party forthwith. Any notice pursuant hereto shall include full particulars of:

(a) The nature, extent and Material Adverse Impact of each Force Majeure Event which is the subject of any claim for relief under this Article 16 with evidence in support thereof;
(b) The estimated duration and the effect or probable effect which such Force Majeure Event is having or will have on the Affected Party’s performance of its obligations under this Agreement;
(c) The measures which the Affected Party is taking or proposes to take, to alleviate the impact of such Force Majeure Event; and
(d) Any other information relevant to the Affected Party’s claim.

16.5.2 The Affected Party shall not claim any relief for or in respect of a Force Majeure Event unless it shall have notified the other Party and Independent Engineer and Auditor in writing of the occurrence of the Force Majeure event as soon as reasonably practicable, and in any event within 7 (seven) days after the Affected Party knew, or ought reasonably to have known, of its occurrence and the probable material effect that the Force Majeure Event is likely to have on the performance of its obligation under this Agreement.

16.5.3 For so long as the Affected Party continues to claim to be affected by such Force Majeure Event, it shall provide the other Party with regular (and not less than weekly) written reports containing information as required by this Clause 16.5.1, and such other information as the other Party may reasonably request the Affected Party to provide.

16.6 **Effect of Force Majeure Event on the Contract**

16.6.1 Upon the occurrence of any Force Majeure Event prior to the Commencement date, the period set forth in Clause 4.1.2 for fulfilling Conditions Precedent shall be extended by a period equal in length to the duration of the Force Majeure Events.

16.6.2 At any time after the signing of this Agreement, if any Force Majeure Event occurs:

(a) Before issue of Letter of Commencement as per Clause 10.2.3, on account for Water Force Majeure, Termination of this Agreement as the discretion of the DCO; or
(b) Before COD, the Contract Period and the SCOD shall be extended by a period equal in length to the duration for which such Force Majeure Event other than Water Force Majeure Event subsists; or
(c) After COD, whereupon the DCO is unable to provide Services under this Agreement, the DCO shall suspend the Services under this Agreement.

16.7 **Allocation of costs arising out of Force Majeure**

16.7.1 Upon occurrence of any Force Majeure Event prior to the Commencement Date, the Parties shall bear their respective costs and no Party shall be required to pay to the other Party any costs thereof;
16.7.2 Upon occurrence of a Force Majeure Event after the Commencement Date, the costs incurred and attributable to such event and directly relating to the Project (the “Force Majeure Costs”) shall be allocated and paid as follows:

(a) Upon occurrence of a Non-Political Event, the Parties shall bear their respective Force Majeure Costs and neither Party shall be required to pay to other Party any costs thereof;
(b) Upon occurrence of an Indirect Political Event or Water Force Majeure Event, the Parties shall bear their respective Force Majeure Costs and IRCTC shall one-half of the Force Majeure Costs thereof;
(c) Upon occurrence of a Political Event, all Force Majeure Costs attributable to such Political Event shall be reimbursed by IRCTC to the DCO.

For avoidance of doubt, Force Majeure Costs shall not include any debt related obligations but shall include additional O&M Expenses and all other costs directly attributable to the Force Majeure Event over and above the expenses incurred in relation to normal operations and which cannot be avoided.

16.7.3 Save and except as expressly provided in this Article 16, neither Party shall be liable in any manner whatsoever to the other Party in respect of any loss, damage, cost, expense, claims, demands and proceedings relating to or arising out of occurrence or existence of any Force Majeure Event or exercise of any right pursuant hereto.

16.8 Termination due to Force Majeure Event

16.8.1 In the event of Water Force Majeure Event, prior to issue of Letter of Commencement, the DCO may at its discretion terminate this Agreement with no liability of any Party to the other. IRCTC shall forthwith return to the DCO Bid Security or Performance Security submitted by the DCO under the terms of the Request of Proposal or this Agreement.

16.8.2 Post issue of Letter of Commencement, if the period of Force Majeure continues or is in the reasonable judgement of the Parties likely to continue beyond a period of 120 (one hundred and twenty) days, the Parties may mutually decide to terminate this Agreement or continue this Agreement on mutually agreed revised terms. If the Parties are unable to reach an agreement in this regard, the Affected Party shall after the expiry of the said period of 120 (one hundred and twenty) days be entitled to terminate this Agreement subject to provisions of Clauses 16.9.

16.9 Termination Payment for Force Majeure Events:

16.9.1 Upon Termination of this Agreement pursuant to Clause 16.8.2, Termination Payment of the DCO shall be made in accordance with the following in addition to returning the Bid Security and /or Performance Security provided by the DCO if the same has not been returned by IRCTC:

(a) If the Termination is on account of a Non-Political Event other than Water Force Majeure, IRCTC shall pay to the DCO 90 (ninety) percent of Debt Due less Insurance Cover;
(b) If the Termination is on account of Water Force Majeure, IRCTC shall pay to the DCO 50 (fifty) percent of Debt Due less insurance cover less realised value of the Project Asset;

(c) If the Termination is on account of an Indirect Political Event, IRCTC shall 100 (one hundred) percent of Debt Due and 110 (one hundred and ten) percent of Adjusted Equity less Insurance Cover;

(d) If the Termination is on account of a Political Event, IRCTC shall make a Termination Payment to the DCO in an amount equal that would be payable under the Clause 18.3.2 as if it were an IRCTC Default.

16.9.2 Provided IRCTC shall be entitled to deduct from the Termination Payment any amount due and recoverable by IRCTC from the DCO as on the Termination Date.

16.9.3 In addition to the Termination Payment, IRCTC shall pay to the DCO the payment due under Article 14 for Services satisfactorily performed by the DCO prior to the date of Termination.

16.9.4 Subject to Clause 16.10, the DCO hereby expressly agrees that the Termination Payment under this Clause 16.9 shall constitute full and final settlement of all claims of the DCO on account of Termination of this Agreement due to Force Majeure events and that the DCO or any shareholder thereof shall not have any further right or claim under any law, treaty, convention, contract or otherwise.

16.9.5 On payment of Termination Payment, the ownership of all the assets of the DCO relating to the PDW Plant shall be transferred to IRCTC with immediate effect. The DCO shall execute all such documents as required for the purpose.

16.10 **Excuse from performance of obligations**

16.10.1 If the Affected Party is rendered wholly or partially unable to perform its obligation under this Agreement because of a Force Majeure Event, it shall be excused from performance of such of its obligations to the extent it is unable to perform on account of such Force Majeure Event provided that:

(a) The suspension of performance shall be of no greater scope and of no longer duration than is reasonably required by the Force Majeure Event;

(b) The Affected Party shall make all reasonable efforts to mitigate or limit damage to the other Party arising out of or as a result of the existence or occurrence of such Force Majeure Event and to cure the same with due diligence, and

(c) When the Affected Party is able to resume performance of its obligations under this Agreement, it shall give to the other Party written notice to that effect and shall promptly resume performance of its obligations hereunder.
17 Events Default and Compensation for Breach

17.1 DCO’s event of Default (DCO Default)

17.1.1 Subject to Article 16, the DCO shall be deemed to be in material default or breach of this Agreement (“DCO Default”) in the event of any of the following:

(a) Failure to meet Conditions Precedent set forth in Clause 4.1.3 within the stipulated time;
(b) Failure to meet project timelines as stipulated under this Agreement;
(c) The Project Site is abandoned for more than 90 (ninety) days during the Construction Period;
(d) The Performance Security is not maintained in terms of the provisions hereof;
(e) Material Breach with regard to Operation and Maintenance the PDW Plant as per Standards and Specifications ;
(f) Material and persistent Quality and Quantity shortfall in PDW ;
(g) Material and persistent failure to provide CFA and Transportation Services as per the terms of this Agreement;
(h) Any representation made or warranties given by the DCO under this Agreement is found to be false or misleading;
(i) Failure to maintain adequate insurance cover;
(j) The DCO passing a resolution for voluntary winding up;
(k) Appointment of a provisional liquidator, administrator, trustee or receiver of the whole or substantially whole of the undertaking of the DCO by a court of competent jurisdiction in proceedings for winding up or any other legal proceedings;
(l) The DCO abandons or expresses its intention to revoke / terminate this Agreement without being entitled to do so as is expressly provided in the Agreement;
(m) Change in ownership other than as permitted under Clause 5.3;
(n) The DCO has been, or is in the process of being liquidated, dissolved, wound- up, amalgamated or reconstituted in a manner that would cause, in the reasonable opinion of IRCTC, a Material Adverse Effect;
(o) A material default in complying with any other provision of this Agreement if such a default causes a Material Adverse Effect on IRCTC;
(p) Other such events as specified in the Agreement.

17.2 Default by IRCTC

17.2.1 Subject to Article 16, IRCTC shall be deemed to be in breach of this Agreement (“IRCTC Default”) in the event of any of the following:

(a) Failure to make payments to the DCO as per the terms of this Agreement;
(b) Material default in complying with any of the provisions of this Agreement and such default has a Material Adverse Effect on the DCO;
(c) Any representation made or warranties given by IRCTC under this Agreement is found to be false or misleading;
(d) IRCTC repudiates this Agreement or otherwise takes any action that amounts to or manifests an irrevocable intention not to be bound by this Agreement;
(e) Other such events as specified in the Agreement.

17.3 Cure Period in case of Event of Default

17.3.1 In the event of default under this Agreement, a Cure Period, of upto a period of 30 (thirty) days extendable, at the discretion of Affected Party, by another 30 (thirty) days from the occurrence of an event of default, unless otherwise expressly specified for a breach under this Agreement, shall be provided by the Affected Party to the Party at default to cure the default.

17.3.2 In the event of default under this Agreement is not cured before the expiry of the Cure Period provided for the same under this Agreement and the default continues such that the operations cannot be carried out normally and the default has Material Adverse Effect on the Affected Party, in such a case the Affected Party may call for termination of the Agreement.

17.4 Compensation for default by the DCO

17.4.1 Subject to the provisions of Clause 17.6, in the event of the DCO being in material default or breach of this Agreement, it shall pay to IRCTC by way of Damages, losses, all direct costs and compensation suffered or incurred by IRCTC as a consequence of such material default or breach, within 30 (thirty) days of receipt of the demand supported by necessary particulars thereof; provided that no compensation shall be payable under this Clause for any material breach or default in respect of which Damages are expressly specified and payable under this Agreement or for any consequential losses incurred by IRCTC. Without prejudice to whatever is stated herein above, IRCTC shall have the right to adjust the Damages etc., payable as stated herein from the payment due to DCO under this Agreement and/or Performance Security.

17.5 Compensation for default by IRCTC

17.5.1 Subject to the provisions of Clause 17.6, in the event of IRCTC being in material default or breach of this Agreement at any time after the Commencement Date, it shall pay to the DCO by way of Damages, losses and all direct costs suffered or incurred by the DCO as a consequence of such material default or breach within 30 (thirty) days of receipt of the demand supported by necessary particulars thereof; provided that no such compensation shall be payable under this Clause for any material breach or default in respect of which Damages have been expressly specified in this Agreement.
17.6 Mitigation of costs and damage

17.6.1 The Affected Party shall make all reasonable efforts to mitigate or limit the costs and damage arising out of or as a result of breach of Agreement by the other Party.

18 TERMINATION

18.1 Termination for DCO Default

18.1.1 Without prejudice to any other rights or remedies which IRCTC may have under this Agreement, upon occurrence of a DCO Default and failure of the DCO to cure the DCO Default within the Cure Period, IRCTC shall be entitled to terminate this Agreement by issuing a Termination Notice to the DCO. The Termination under this Article shall be effective 7 days from the issue of Termination Notice (“Termination Date”).

18.2 Termination for IRCTC Default

18.2.1 Without prejudice to any other right or remedy which the DCO may have under this Agreement, upon occurrence of an IRCTC Default and failure of IRCTC to cure IRCTC Default within the Cure Period, the DCO shall, be entitled to terminate this Agreement by issuing a Termination Notice to IRCTC The Termination under this Article shall be effective 7 days from the issue of Termination Notice.

18.3 Termination Payment

18.3.1 Upon the termination of this Agreement pursuant to Clauses 18.1.1 and 18.2.1 of the Agreement, IRCTC shall pay the DCO the payment due under Article 14 for Services satisfactorily performed by the DCO prior to the date of termination less amounts due, if any, to IRCTC from the DCO under the provisions of this Agreement.

18.3.2 In case of termination of this Agreement by the DCO for DCO Default pursuant to Clause 18.1.1 any time after the issue of Letter of Commencement, IRCTC shall in addition to the payment in the above Clause 18.3.1, pay the DCO 90% of Debt Due as on the date of Termination Notice. However, IRCTC shall invoke the Performance Security provided by the DCO under this Agreement.

18.3.3 In case of termination of this Agreement by the DCO for an IRCTC Default pursuant to Clause 18.2.1 any time after the issue of Letter of Commencement, IRCTC shall in addition to the payment in the above Clause 18.3.1, pay the DCO the sum of (a) the Debt Due and (b) the 150% of Adjusted Equity IRCTC shall return the Performance Security and Additional Bank Guarantee to the DCO if it has not already been returned.

18.3.4 The DCO hereby expressly agrees that the Termination Payment, if any, under this Article 18 shall constitute full and final settlement of all claims of the DCO on account of Termination of this Agreement for any reason whatsoever and that the DCO or any shareholder thereof shall not have any further right or claim under any law, treaty, convention, contract or otherwise.
18.4 Other rights and obligations of IRCTC

18.4.1 Upon Termination for any reason whatsoever, IRCTC shall:

(a) Be deemed to have taken possession and control of the PDW Plant forthwith
(b) Take possession and control of all materials, stores, implements, construction plants and equipment
(c) Be entitled to restrain the DCO and any person claiming through or under the DCO from entering upon the Site or any part of the PDW Plant
(d) Require the DCO to comply with the Divestment Requirements set forth in Clause 19.1; and
(e) succeed upon election by IRCTC, without the necessity of any further action by the DCO, to the interests of the DCO under such of the Project Agreements as IRCTC may in its discretion deem appropriate, and shall upon such election be liable to the Contractors only for compensation accruing and becoming due and payable to them under the terms of their respective Project Agreements from and after the date IRCTC elects to succeed to the interests of the DCO. For the avoidance of doubt, the DCO acknowledges and agrees that all sums claimed by such Contractors as being due and owing for works and services performed or accruing on account of any act, omission or event prior to such date shall constitute debt between the DCO and such Contractors, and IRCTC shall not in any manner be liable for such sums. It is further agreed that in the event IRCTC elects to cure any outstanding defaults under such Project Agreements, the amount expended by IRCTC for this purpose shall be deducted from the Termination Payment.

18.5 Survival of rights

18.5.1 Notwithstanding anything to the contrary contained in this Agreement, but subject to the provisions of Clause 18.3.4, any Termination pursuant to the provisions of this Agreement shall be without prejudice to the accrued rights of either Party including its right to claim and recover money damages, insurance proceeds, security deposits, and other rights and remedies, which it may have in law or contract. All rights and obligations of either Party under this Agreement, including Termination Payments and Divestment Requirements, shall survive the Termination to the extent such survival is necessary for giving effect to such rights and obligations.

19 Divestment of Rights and Interests

19.1 Divestment Requirements

19.1.1 Upon Termination, the DCO shall comply with and conform to the following Divestment Requirements:

(a) Notify to IRCTC forthwith the location and particulars of all assets of PDW Plant, include PDW stock;
(b) Deliver forthwith the actual or constructive possession of the PDW Plant, free and clear of all Encumbrances, and hand over all the PDW stock;
(c) Cure all assets of the PDW Plant of all defects and deficiencies so that the PDW Plant is in reasonably good condition; provided that in the event of Termination prior the scheduled Termination Date, the PDW Plant shall be handed over on ‘as is where is’ basis after bringing them to a safe condition;
(d) Deliver and transfer relevant records, reports, Intellectual Property and other licences pertaining to the PDW Plant and its design, engineering, construction, operation and maintenance, including all programmes and manuals pertaining thereto, and complete ‘as built’ Drawings as on the Transfer Date. For the avoidance of doubt, the DCO represents and warrants that the Intellectual Property delivered hereunder shall be adequate and complete for the design, engineering, construction, operation and maintenance of the PDW Plant and shall be assigned to IRCTC free of any encumbrance;
(e) Transfer and/or deliver all Applicable Permits to the extent permissible under Applicable Laws;
(f) Execute such deeds of conveyance, documents and other writings as IRCTC may reasonably require for conveying, divesting and assigning all the rights, title and interest of the DCO in the PDW Pant, including manufacturers’ warranties in respect of any plant or equipment and the right to receive outstanding insurance claims to the extent due and payable to IRCTC, absolutely unto IRCTC or its nominee; and
(g) Comply with all other requirements as may be prescribed or required under Applicable Laws for completing the divestment and assignment of all rights, title and interest of the DCO in the PDW Plant, free from all Encumbrances, absolutely unto IRCTC or to its nominee.

19.1.2 Subject to the exercise by IRCTC of its rights under this Agreement or under any of the Project Agreements to perform or procure the performance by a third party of any of the obligations of the DCO, the Parties shall continue to perform their obligations under this Agreement, notwithstanding the giving of any Termination Notice, until the Termination of this Agreement becomes effective in accordance with its terms.

19.2 Inspection and cure

19.2.1 Not earlier than 90 (ninety) days prior to Termination but not later than 15 (fifteen) days prior to the effective date of such Termination, IRCTC the Independent Engineer shall verify, after giving due notice to the DCO of the time, date and venue of such verification, compliance by the DCO with the maintenance requirements, and if required, cause appropriate tests to be carried out at the DCO’s cost for this purpose. Defaults, if any, in the maintenance requirements shall be cured by the DCO at its cost and the provisions of Article 20 shall apply, mutatis mutandis, in relation to curing of defects or deficiencies under this Article 20.
19.3 Cooperation and assistance on transfer of Project

19.3.1 The Parties shall cooperate on a best effort basis and take all necessary measures, in good faith, to achieve a smooth transfer of the PDW Plant in accordance with the provisions of this Agreement.

19.3.2 The Parties shall provide to each other, six (months) months prior to the Transfer Date in the event of Termination by efflux of time and immediately in the event of either Party conveying to the other Party its intent to issue a Termination Notice, as the case may be, as much information and advice as is reasonably practicable regarding the proposed arrangements for operation of the PDW Plant and the PDW Stock following the Transfer Date. The DCO shall further provide such reasonable advice and assistance as IRCTC, its DCO or agent may reasonably require for operation of the Project until the expiry of 6 (six) months after the Transfer Date.

19.4 Vesting Certificate

19.4.1 The divestment of all rights, title and interest in the PDW Plant shall be deemed to be complete on the date when all of the Divestment Requirements have been fulfilled, and IRCTC shall, without unreasonable delay, thereupon issue a certificate which will have the effect of constituting evidence of divestment by the DCO of all of its rights, title and interest in the PDW Plant, and their vesting in IRCTC pursuant hereto at no additional cost beyond what has been paid under the terms of this Agreement. It is expressly agreed that any defect or deficiency in the Divestment Requirements shall not in any manner be construed or interpreted as restricting the exercise of any rights by IRCTC or its nominee on, or in respect of, the PDW Plant on the footing that all Divestment Requirements have been complied with by the DCO.

19.5 Divestment costs etc.

19.5.1 The DCO shall bear and pay all costs incidental to divestment of all of the rights, title and interest of the DCO in the PDW Plant in favour of IRCTC upon Termination, save and except that all stamp duties payable on any deeds or Documents executed by the DCO in connection with such divestment shall be borne by IRCTC.

19.5.2 In the event of any dispute relating to matters covered by and under this Article, the Dispute Resolution Procedure shall apply.

19.6 Liability for defects after Termination

19.6.1 The DCO shall be responsible for all defects and deficiencies, other than those caused by normal wear and tear, in the PDW Plant for a period of 120 (One hundred and twenty) days after Termination, and it shall have the obligation to repair or rectify, at its own cost, all defects and deficiencies in the PDW Plant during the aforesaid period.
Part IV: Miscellaneous

20 ASSIGNMENT AND CHARGES

20.1 Restrictions on assignment and charges

20.1.1 The DCO shall not assign this Agreement to any person, save and except with the prior consent in writing of IRCTC, which consent IRCTC shall be entitled to decline without assigning any reason.

20.1.2 Subject to the provision of Clause 20.2, the DCO shall not create nor permit to subsist any Encumbrance, or otherwise transfer or dispose of all or any of its rights and benefits under this Agreement or any Project Agreement to which the DCO is a party except with prior consent in writing of IRCTC, which consent IRCTC shall be entitled to decline without assigning any reason.

20.2 Permitted assignment and charges

20.2.1 The restraints set forth in Clause 20.1 shall not apply to:

(a) Liens arising by operation of law (or by an agreement evidencing the same) in the ordinary course of business of the Project;

(b) Mortgages/pledges/hypothecation of goods/assets including Project Assets and their related documents of title excluding that on the Site, a charge on the Designated Bank Account of DCO, arising or created in the ordinary course of business of the Project, and as security only for indebtedness to the Lenders under the Financing Documents and/or for working capital arrangements for the Project; and

(c) Liens or encumbrances required by any Applicable Law.

20.3 Assignment by IRCTC

20.3.1 Notwithstanding anything to the contrary contained in this Agreement, IRCTC may, after giving 60 (sixty) days’ notice to the DCO, assign and/or transfer any of its rights and benefits and/or obligations under this Agreement; to an assignee who is, in the reasonable opinion of IRCTC, capable of fulfilling all of IRCTC’s then outstanding obligations under this Agreement.

21 LIABILITY AND INDEMNITY

21.1 General Indemnity

21.1.1 The DCO will indemnify, defend, save and hold harmless IRCTC and its officers, servants, agents, Government Instrumentalities and Government owned and/or controlled entities/enterprises, (the “IRCTC Indemnified Persons”) against all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by the DCO of any of its obligations under this Agreement or any related agreement or on account of any defect or deficiency in the provision of services by the DCO or from
any negligence of the DCO under contract or tort or on any other ground whatsoever, except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of this Agreement on the part of IRCTC Indemnified Persons.

21.2.2 IRCTC will indemnify, defend, save and hold harmless the DCO against defect in title and/or rights of IRCTC in the land comprised in the Site, any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature arising out of breach by IRCTC of any of its obligations under this Agreement or any related agreement, which materially and adversely affect the performance by the DCO of its obligations under this Agreement, save and except that where any such claim, suit, proceeding, action, and/or demand has arisen due to a negligent act or omission, or breach of any of its obligations under any provision of this Agreement or any related agreement and/or breach of its statutory duty on the part of the DCO, its subsidiaries, affiliates, contractors, servants or agents, the same shall be the liability of the DCO.

21.2 Indemnity by the DCO

21.2.1 Without limiting the generality of Clause 21.1, the DCO shall fully indemnify, hold harmless and defend IRCTC and IRCTC Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:

(a) Failure of the DCO to comply with Applicable Laws and Applicable Permits;
(b) Payment of taxes, levies, fees and any other statutory dues required to be made by the DCO in respect of the income or other taxes of the DCO’s contractors, suppliers and representatives; or
(c) Non-payment of amounts due as a result of materials or services furnished to the DCO or any of its contractors which are payable by the DCO or any of its contractors.

21.2.2 Without limiting the generality of the provisions of this Article 21, the DCO shall fully indemnify, hold harmless and defend IRCTC Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which IRCTC Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by the DCO or by the DCO’s Contractors in performing the DCO’s obligations or in any way incorporated in or related to the Project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, the DCO shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, the DCO shall promptly make every reasonable effort to secure for IRCTC a licence, at no cost to IRCTC, authorising continued use of the infringing work. If the DCO is unable to secure such licence within a reasonable time, the DCO shall, at its own expense, and without impairing the Standards and Specifications, either replace the affected work, or part,
or process thereof with non-infringing work or part or process, or modify the same so that it becomes non-infringing.

21.2.3 The DCO shall indemnify IRCTC against all claims whatsoever arising out of any Statute/Law in force in respect of the personnel engaged by him directly or indirectly for the Project.

21.3 No consequential claims

21.3.1 Notwithstanding anything to the contrary contained in this Article 21, the indemnities herein provided shall not include any claim or recovery in respect of any cost, expense, loss or damage of an indirect, incidental or consequential nature, including loss of profit, except as expressly provided in this Agreement.

21.4 Survival on Termination

21.4.1 The provisions of this Article 21 shall survive Termination.

22 DISPUTE RESOLUTION (ARBITRATION CLAUSE)

22.1 Dispute Resolutions

22.1.1 Any dispute, difference or controversy of whatever nature regarding the validity, interpretation or the rights and obligations arising out of, or in relation to, or howsoever arising under or in relation to this Contract between the Parties, and so notified by either Party to the other Party (the “Dispute”) shall be subject to the dispute resolution procedure set out hereinafter.

22.1.2 Direct discussion between Parties: The Parties agree that any Dispute that may arise between them shall be first submitted for direct discussion between the Parties. For this purpose, the notice of Dispute (the “Notice of Dispute”) sent by one Party to the other Party shall be considered an invitation for direct discussion, and it should specify a reasonable time and venue for conduct of the negotiation proceedings. In addition, the Notice of Dispute shall specify the basis of the Dispute. In the direct discussion proceedings, both the Parties shall be represented by any of its officials or employees with sufficient knowledge and authority over the subject matter of the Dispute in order for the discussion to be meaningful. At the discussion proceedings, the Party that has given the Notice of Dispute shall present an offer of a settlement, which may form the starting point of discussions between the two Parties during the discussion proceedings.

22.1.3 Reconciliation: In the event that the parties are unable to resolve the Dispute through Direct Discussion under the Article 22.2 of the draft contract agreement, any party may make a reference to the Chairman cum Managing Director IRCTC to reconcile the differences and determine the rights and obligations of both the parties. The CMD may further appoint a committee of 2/3 members, one of whom will be nominee of the bidder.

22.1.4 Arbitration or Adjudication: In the event that the parties are unable to resolve the Dispute through the process of reconciliation under the Article 22.2 and 22.3 of
the draft contract agreement, the Parties shall submit the Dispute for arbitration in accordance with the Arbitration and Conciliation Act, 1996.

22.1.5 The Arbitration shall be conducted by a three member Arbitration tribunal. One member each shall be appointed by both the Parties. Such arbitrators shall be either serving Government Officers or a retired judicial officer or an officer on the panel of Indian Council of Arbitrator or IRCTC. They shall, within 30 days of their appointment, mutually decide on the name of the third arbitrator. Arbitrator proceedings shall be deemed to commence only on the first date of meeting of all the three arbitrators. The place of Arbitration shall be New Delhi.

22.1.6 Any decision or award resulting from Arbitration shall be final and binding upon the Parties. The fees and expenses of the Arbitration tribunal and all other expenses of the Arbitration shall be initially borne and jointly paid by the Parties in equal proportion subject to determination by the Arbitration tribunal in accordance with instructions no. 2011/IRCTC/CO/Legal/App. Arbitration dated 05.09.2012.

22.1.7 Pending the submission of and/or decision on a dispute, difference or claim or until the arbitral award is made; the parties shall continue to perform all of their obligations under this Agreement without prejudice to a final adjustment in accordance with such award.

22.2 Performance during Dispute:
Save in such cases where the dispute has arisen due to premature termination, performance of this Contract shall continue during the settlement of any Dispute under this Article 22 of the draft contract agreement. The provisions for dispute settlement shall be binding upon the successors, assigns and any trustee or receiver of either the parties. In case of premature termination, the Project Premises shall revert back to the IRCTC.

23 MISCELLANEOUS

23.1 Governing Law and jurisdiction

23.1.1 This Agreement shall be construed and interpreted in accordance with the laws of India and the court at New Delhi shall have jurisdiction over all matters arising out of or relating to this Agreement.

23.2 Waiver of immunity

23.2.1 Each Party unconditionally and irrevocably:

(a) Agrees that the execution, delivery and performance by it of this Agreement constitute commercial acts done and performed for commercial purpose;

(b) Agrees that, should any proceedings be brought against it or its assets, property or revenues in any jurisdiction in relation to this Agreement or any transaction contemplated by this Agreement, no immunity (whether by reason of sovereignty or otherwise) from such proceedings shall be claimed by or on behalf of the Party with respect to its
assets;
(c) Waives any right of immunity which it or its assets, property or revenues now has, may acquire in the future or which may be attributed to it in any jurisdiction; and
(d) Consents generally in respect of the enforcement of any judgement or award against it in any such proceedings to the giving of any relief or the issue of any process in any jurisdiction in connection with such proceedings (including the making, enforcement or execution against it or in respect of any assets, property or revenues whatsoever irrespective of their use or intended use of any order or judgement that may be made or given in connection therewith).

23.3 Waiver

23.3.1 Waiver, including partial or conditional waiver, by either Party of any default by other Party in the observance and performance of any provision of or obligations of or under this Agreement.
I. shall not operate or be construed as a waiver of any other or subsequent default hereof or of other provisions of or obligations under this Agreement;
II. shall not be effective unless it is in writing and executed by a duly authorized representative of the party; and
III. shall not affect the validity or enforceability of this Agreement in any manner.

23.3.2 Neither the failure by either Party to insist on any occasion upon the performance of the terms, conditions and provisions of this Agreement or any obligation there under nor time or other indulgence granted by a Party to the other Party shall be treated or deemed as waiver of such breach or acceptance of any variation or the relinquishment of any such right hereunder.

23.4 Liability for review of documents and drawings

23.4.1 Except to the extent expressly provided in this Agreement:
(a) no review, comment or approval by IRCTC or the Independent Engineer of any Project Agreement, Document or Drawing submitted by the DCO nor any observation or inspection of the construction, operation or maintenance of the Project nor the failure to review, approve, comment, observe or inspect hereunder shall relieve or absolve the DCO from its obligations, duties and liabilities under this Agreement, the Applicable Laws and Applicable Permits; and
(b) IRCTC shall not be liable to the DCO by reason of any review, comment, approval, observation or inspection referred to in Sub-clause (a) above.

23.5 Exclusion of implied warranties etc

23.5.1 This Agreement expressly excludes any warranty, condition or other undertaking implied at law or by custom or otherwise arising out of any other agreement between the Parties or any representation by either Party not contained in a binding
legal agreement executed by both Parties.

23.6 Survival

23.6.1 Termination of this Agreement

(a) Shall not relieve the DCO or IRCTC of any obligations hereunder which expressly or by implication survives Termination hereof, and
(b) except as otherwise provided in any provision of this Agreement expressly limiting the liability of either Party, shall not relieve either Party of any obligations or liabilities for loss or damage to the other Party arising out of or caused by acts or omissions of such Party prior to the effectiveness of such Termination or arising out of such termination.

All obligations surviving the cancellation, expiration or Termination of this Agreement shall only survive for a period of 5 (five) years following the date of such Termination or expiry of this Agreement.

23.7 Entire Agreement:

The Agreement and the Schedules constitutes a complete and exclusive statement of the terms of the agreement between the Parties on the subject hereof and no amendment or modification hereto shall be valued and effective unless expressly previously approved in writing by IRCTC and executed by the person expressly authorized by a resolution of IRCTC in this behalf.

All prior written or oral understandings, offers or other communications of every kind pertaining to this Agreement are abrogated and withdrawn. For the avoidance of doubt, the Parties hereto agree that any obligations of the DCO arising from the Request for Qualification or Request for Proposals, as the case may be, shall be deemed to form part of this Agreement and treated as such.

23.8 Severability

If for any reason whatever any provision of this Agreement is or becomes invalid, illegal or unenforceable or is declared by any court of competent jurisdiction or any other instrumentality to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall not be affected in any manner, and the Parties will negotiate in good faith with a view to agreeing one or more provisions which may be substituted for such invalid, unenforceable or illegal provisions, as nearly as is practicable to such invalid, illegal or unenforceable provision. Failure to agree upon any such provisions shall not be subject to dispute resolution under this Agreement or otherwise.

23.9 No Partnership

Nothing contained in this Agreement shall be construed or interpreted as
constituting a partnership between the Parties. Neither Party shall have any right to bind the other in any manner whatsoever.

23.10 **Third Parties**

This Agreement is intended solely for the benefit of the Parties, and their respective successors and permitted assigns, and nothing in this Agreement shall be construed to create any duty to, standard of care with reference to, or any liability to, any person not a Party to this Agreement.

23.11 **Successors and assigns**

This Agreement shall be binding upon, and inure to the benefit of the Parties and their respective successors and permitted assigns.

23.12 **Notices**

Any notice or other communication to be given by Party to the other Party under, or in connection with the matters contemplated by this Agreement shall be in writing and shall:

(a) In the case of the DCO, be given by letter delivered by hand or by registered acknowledgement due pre-paid post or speed post to the address given and marked for the attention of the person set out below or to such other person as the DCO may from time to time designate by notice to IRCTC;
(b) in the case of IRCTC, be given by letter delivered by hand or by registered acknowledgement due pre-paid post or speed post to the address given and marked for the attention of the person set out below or to such other person as IRCTC may from time to time designate by notice to the DCO.

23.13 **Language**

All notices required to be given by one Party to the other Party and all other communications, documentation and proceedings which are in any way relevant to this Agreement shall be in writing and in English language.

23.14 **Counterparts**

This Agreement may be executed in two counterparts, each of which when executed and delivered shall constitute an original of this Agreement.
IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DAY, MONTH AND YEAR FIRST ABOVE WRITTEN.

SIGNED, SEALED AND DELIVERED  
For and on behalf of BY INDIAN  
RAILWAYCATERING AND TOURISM  
CORPORATION LTD

(Signature)  
(Name)  
(Designation)  
In the presence of:
1.  
2.

SIGNED, SEALED AND DELIVERED For  
and on behalf of by DCO

(Signature)  
(Name)  
(Designation)  
In the presence of:
1.  
2.
Schedules
### Schedule A: Site

The Site of the Project shall include the land, building, structures, rail siding and related facilities of the PDW Plant.

The details of the land for the Site are as follows:

<table>
<thead>
<tr>
<th>Project Location</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>{ refer LoA}</td>
<td></td>
</tr>
<tr>
<td>Name of the village/town / city where the land (site) is located</td>
<td></td>
</tr>
<tr>
<td>Survey numbers of the land (site)</td>
<td></td>
</tr>
<tr>
<td>Extent of land</td>
<td></td>
</tr>
<tr>
<td>Nearest National / State Highway and distance of the site from the same</td>
<td></td>
</tr>
</tbody>
</table>
Schedule B: Payment schedule to setup the Plant
Schedule C: Details of Stations with Estimated Rail Neer demand
Schedule D: Base Rate

As per Letter of Acceptance (LoA) of contract
Schedule E: Scope of Work & Technical Specifications:
Schedule F: Technical Specifications covering Civil, Electrical, PEB, Allied Works & Machines (Chapter 13-21)