

UDAIPUR SMART CITY LIMITED

NIT No. 13 /2016-17 **Bidding Document**

Design, construction, supply, installation, testing and commissioning and operating for 15 years under Hybrid Annuity Model (Which will include all Civil, Mechanical, electrical, instrumentation & other necessary works) of STP's (25 MLD + 10 MLD + 5 MLD) based on SBR Process (equivalent or higher process) having provision for reuse of 50% treated water of Udaipur Town

Bidding Document

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UDAIPUR SMART CITY LIMITED

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DETAILED NOTICE INVITING BID (NIB)

NIT No: E-13 / 2016-17

Udaipur Smart City Limited invites online unconditional tenders under Single Stage two envelope system are invited through e-procurement portal <http://eproc.rajasthan.gov.in> from eligible bidders as per criteria mentioned in bid document, for Design, construction, supply, installation, testing and commissioning and operating for 15 years under Hybrid Annuity Model (Which will include all Civil, Mechanical, electrical, instrumentation & other necessary works) of STP's (25 MLD + 10 MLD + 5 MLD) based on SBR Process (equivalent or higher process) having provision for reuse of 50% treated water of Udaipur Town-

Name & Address of the Procuring Entity	Name: Sidharth Sihag, Chief Executive Officer Address: Udaipur Smart City Limited, Udaipur
Subject Matter of Procurement	Works of STP's and operating for 15 years under HAM
Period of completion of physical works	24 months
Bid Procedure	Single-stage: Two Part (envelope) open competitive eBid procedure at http://eproc.rajasthan.gov.in
Bid Evaluation Criteria (Selection Method)	Least Cost based selection
Eligibility Criteria	As detailed in bid documents
Websites for downloading Bidding Document	sppp.rajasthan.gov.in eproc.rajasthan.gov.in
Fees	Bidding document fee (Non-Refundable): Rs. 20000/- (Rupees Twenty Thousand only) in Cash/Demand Draft drawn on any Scheduled/ Commercial Bank in favour of “ Chief Executive Officer , Udaipur Smart City Limited” payable at “Udaipur”. Tender Processing Fee (Non-Refundable): Rs. 1000 (Rupees One Thousand only) in Demand Draft drawn on any Scheduled/ Commercial Bank in favour of “Managing Director, RISL” payable at “Jaipur”
Estimated Procurement Cost	Rupees Eighty Crores (INR 80,00,00,000)
Bid Security and Mode of	Amount: INR 1,60,00,000/- (Rupees One crore sixty lakhs)

Payment	Only) Mode of Payment: Banker's Cheque/Demand Draft drawn on any Scheduled Commercial Bank or Bank Guarantee as per Bid document.
Period of on-line availability of Bidding Documents (Start / End Date)	From: 10.12.2016, 11.00 AM onwards till 06:00 PM of 15.01.2017
Pre-bid Meeting	Date/ Time 27.12.16 at 03:00 PM Place: Udaipur Smart City Limited, Udaipur
Manner, End Date for submission of Bids	Manner: Online at eProc website (http://eproc.rajasthan.gov.in) End Date: 16.01.17 (up to 04:00 P.M.)
Submission of original Banker's Cheque/ Demand Draft for Bid Document cost, Bid Security, Bid Processing Fee & other documents listed herein after	16.01.17 till 03:00 PM
Date & Time of Technical Bid Opening	Date: 19.01.17 Time: 04:00 PM
Date/ Time/ Place of Financial Bid Opening	Will be intimated later to the Technically qualified bidders
Bid Validity	180 days from the bid submission deadline
Note: 1) Bidders (authorised signatory) shall submit their offer on-line in Electronic formats both for technical and financial proposal. However, DD / Banker's Cheques / BG (if applicable) for RFP Document Fees, RISL Processing Fees and Bid Security should be submitted physically in original at the office of Udaipur Smart City Limited, Udaipur by time and date mentioned above as prescribed in bid document and scanned copy of same should also be uploaded along with the technical Bid/ cover. 2) In addition to above, the following original documents should also be submitted physically in the Udaipur Smart City Limited, Udaipur office by time and date mentioned above and scanned copies of same should also be uploaded along with the technical Bid/ cover:	

- i. Letter of Technical Bid
 - ii. Power of Attorney for appointing authorized representative
 - iii. Joint Venture Agreement (if applicable)
 - iv. Proof of Registration in AA class as required
- 3) Any subsequent addendum/corrigendum shall be published only at the websites sppp.raj.nic.in & <http://eproc.rajasthan.gov.in> and will not be published in newspapers. In case there is a holiday on the day of opening of bids, activities assigned on that date shall be carried out on the next working day.
- 4) Before electronically submitting the bids, it should be ensured that all the bid documents including conditions of contract are digitally signed by the bidder.
- 5) Department will not be responsible for delay in online submission due to any reason. For this, bidders are requested to upload the complete bid well advance in time so as to avoid 11th hour issues like slow speed; choking of web site due to heavy load or any other unforeseen problems.
- 6) All the prospective bidders are encouraged to participate in the pre-bid meeting and it is advised that the work sites are visited and bid documents are studied thoroughly.
- 7) The procuring entity reserves the sole right to cancel the bid process and reject any or all of the Bids without assigning any reason.
- 8) Procurement entity disclaims any factual/ or other errors in the bidding document (the onus is purely on the individual bidders to verify such information) and the information provided therein are intended only to help the bidders to prepare a logical bid-proposal.
- 9) No conditional bids shall be accepted and such bids shall be summarily rejected forthwith.
- 10) The provisions of RTPP Act 2012 and Rules 2013 thereto shall be applicable for this procurement. Furthermore, in case of any inconsistency in any of the provisions of this bidding document with the RTPP Act 2012 and Rules thereto, the latter shall prevail.

(Sidharth Sihag) IAS
Chief Executive Officer
Udaipur Smart City Limited, Udaipur

INSTRUCTION TO BIDDERS

Important Instruction:- The Law relating to procurement “The Rajasthan Transparency in Public Procurement Act, 2012” [hereinafter called the Act] and the “Rajasthan Public Procurement Rules, 2012” [hereinafter called the Rules] under the said Act have come into force which are available on the website of State Public Procurement Portal <http://sppp.raj.nic.in>. Therefore, the Bidders are advised to acquaint themselves with the provisions of the Act and the Rules before participating in the Bidding process. If there is any discrepancy between the provisions of the Act and the Rules and this Bidding Document, the provisions of the Law shall prevail.

1. General			
1.1	Scope of Bid	1.1.1	In support of the Invitation to Bid indicated in the Bid Data Sheet (BDS), the Procuring Entity as indicated in the BDS, issues this Bidding Document for the procurement of works as named in the BDS and as specified in Section V, Procuring Entity's Requirements.
1.2	Interpretation	1.2.1	Throughout this Bidding Document: the term “in writing” means communicated in written form through letter, fax, e-mail etc. with proof of receipt. if the context so requires, singular means plural and vice versa; and “Day” means calendar day
1.3	Code of Integrity	1.3.1	Any person participating in the procurement process shall,- i. not offer any bribe, reward or gift or any material benefit either directly or indirectly in exchange for an unfair advantage in procurement process or to otherwise influence the procurement process; ii. not misrepresent or omit that misleads or attempts to mislead so as to obtain a financial or other benefit or avoid an obligation; iii. not indulge in any collusion, bid rigging or anti-competitive behavior to impair the transparency, fairness and progress of the procurement process; iv. not misuse any information shared between the Procuring Entity and the Bidders with an intent to gain unfair advantage in the procurement process; v. not indulge in any coercion including impairing or harming or threatening to do the same, directly or indirectly, to any party or to its property to influence the procurement process; vi. not obstruct any investigation or audit of a procurement process; vii. disclose conflict of interest, if any; and viii. disclose any previous transgressions with any

			Entity in India or any other country during the last three years or any debarment by any other Procuring Entity.
		1.3.2	<p>Conflict of Interest: A conflict of interest is considered to be a situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations.</p> <p>A Bidder may be considered to be in conflict of interest with one or more parties in this bidding process if, including but not limited to:</p> <ul style="list-style-type: none"> i. have controlling partners/ shareholders in common; or ii. receive or have received any direct or in direct subsidy from any of them ;or iii. have the same legal representative for purposes of this Bid; or iv. have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Procuring Entity regarding this bidding process; or v. the Bidder participates in more than one Bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which the Bidder is involved. However, this does not limit the inclusion of the same subcontractor, not otherwise participating as a Bidder, in more than one Bid; or vi. the Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the Works that are the subject of the Bid; or vii. the Bidder or any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as Engineer-in-charge/ consultant for the Contract.
		1.3.3	The Bidder shall have to give a declaration regarding compliance of the Code of Integrity prescribed in the Act, the Rules and stated above in this Clause along with its Bid, in the format specified in Section IV, Bidding Forms.
		1.3.4	Breach of Code of Integrity by the Bidder:- Without prejudice to the provisions of Chapter IV of the Rajasthan Transparency in Public Procurement Act, in case of any breach of the Code of Integrity by a

			Bidder or prospective Bidder, as the case may be, the Procuring Entity may take appropriate action in accordance with the provisions of sub-section (3) of section 11 and section 46 of the Act.
1.4	Eligible Bidders	1.4.1	A Bidder may be a natural person, private Entity, government-owned Entity or, where permitted in the Bidding documents, any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture [JV], Consortium or Association. In the case of a Joint Venture, Consortium or Association:- all parties to the Joint Venture, Consortium or Association shall sign the Bid and they shall be jointly and severally liable; and a Joint Venture, Consortium or Association shall nominate a representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the Joint Venture, Consortium or Association during the Bidding process. In the event the Bid of Joint Venture, Consortium or Association is accepted, either they shall form a registered Joint Venture, Consortium or Association as company/firm or otherwise all the parties to Joint Venture, Consortium or Association shall sign the Agreement.
		1.4.2	A Bidder, and all parties constituting the Bidder, shall have the nationality of India. In case of International Competitive Bidding or Joint Venture, Consortium or Association [where permitted], the nationality of the Bidder and all parties constituting the Bidder shall be of India or an eligible country declared as such by Government of India. A Bidder shall be deemed to have nationality of a country if the Bidder is a citizen or constituted or incorporated, and operates in conformity with the provisions of the Laws of that country. This criterion shall also apply to the determination of the nationality of proposed Sub-Contractors or suppliers for any part of the Contract including related services.
		1.4.3	A Bidder should not have a conflict of interest in the procurement in question as stated in the Rule 81 and this Bidding document.
		1.4.4	A Bidder debarred under section 46 of the Act shall not be eligible to participate in any procurement process undertaken by any Procuring Entity, if debarred by the State Government; and a Procuring Entity, if debarred by such Procuring Entity.
		1.4.5	The Bidder must be a registered Contractor in appropriate class with the Department/ Organization. He shall furnish necessary proof for the same. PSU can be participate in tender without registration.

		1.4.6	<p>i Any change in the constitution of the firm, etc., shall be notified forth with by the Bidder in writing to the Procuring Entity and such change shall not relieve any former partner/ member of the firm, etc from any liability under the Contract.</p> <p>ii No new partner/partners shall be accepted in the firm by the Bidder in respect of the contract unless he/they agree to abide by all its terms, conditions and deposit with the Procuring Entity a written agreement to this effect. The Bidder's receipt for acknowledgement or that of any partners subsequently accepted as above shall bind all of them and will be sufficient discharge for any of the purpose of the Contract.</p> <p>iii The status of the lead partner/ representative of the Joint Venture, Consortium or Association as a major stake holder shall not change without the consent of the Procuring Entity. New major stake holder must agree to abide by all terms and conditions of the Contract.</p>
		1.4.7	Bidders shall provide such evidence of their continued eligibility satisfactory to the Procuring Entity, should the Procuring Entity request.
		1.4.8	In case a prequalification or empanelment or registration process has been conducted prior to the bidding process, this bidding shall be open only to the pre-qualified, empanelled or registered Bidders.
		1.4.9	Each Bidder shall submit only one Bid except in case of alternative bids, if permitted.
		1.4.10	<p>Bidder who is not registered under the Sales Tax Act prevalent in the State of Rajasthan can bid, however selected bidder shall have to be got registered with the Sales Tax department of the state government and submit the proof of registration before signing the Contract agreement.</p> <p>He is also required to provide proof of Permanent Account Number (PAN) given by Income Tax Department.</p>
2. Contents of Bidding Document			
2.1	Sections of the Bidding Document	2.1.1	<p>The Bidding Document consists of Parts I, II, and III, which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB Clause 2.3 [Amendment of Bidding Document].</p> <p>Part I: Bidding Procedures</p> <p>Section I. Instructions to Bidders (ITB)</p> <p>Section II. Bid Data Sheet (BDS)</p> <p>Section III. Evaluation and Qualification Criteria</p> <p>Section IV. Bidding Forms</p> <p>Part II: Requirements</p> <p>Section V. Procuring Entity's Requirements.</p> <p>Part III: Contract</p> <p>Section VI A. General Conditions of Contract [GCC]</p> <p>Section VI B. Special Conditions of Contract [SCC]</p> <p>Section VI C. Contract Forms</p>
		2.1.2	The Invitation for Bids (NIB) issued by the Procuring

			Entity is also part of the Bidding Document.
		2.1.3	i. The Bidding Document shall be uploaded on the e-procurement portal, eproc.raj.nic.in along with the Notice Inviting Bids. The complete Bidding Document shall also be placed on the State Public Procurement Portal, sppp.raj.nic.in. The prospective Bidders may download the bidding document from these portals. The price of the Bidding Document and processing fee of e-bid shall have to be paid to the Procuring Entity in the amount and manner as specified in Bid Data Sheet and e-procurement portal.
		2.1.4	The Procuring Entity is not responsible for the completeness of the Bidding Document and its addenda, if they were not downloaded correctly from the e-procurement portal or the State Public Procurement Portal.
		2.1.5	The Bidder is expected to examine all instructions, forms, terms and specifications in the Bidding Document. Failure to furnish all information or authentic documentation required by the Bidding Document may result in the rejection of the Bid.
2.2	Clarification of Bidding Document and Pre-Bid Conference	2.2.1	The Bidder shall be deemed to have carefully examined the conditions, specifications, size, make and drawings, etc. of the Works and Related Services to be provided. If any Bidder has any doubts as to the meaning of any portion of the conditions or of the specifications, drawings etc., it shall, before submitting the Bid, refer the same to the Procuring Entity and get clarifications. A Bidder requiring any clarification of the Bidding Document shall contact the Procuring Entity in writing or e-mail at the Procuring Entity's address indicated in the BDS. The Procuring Entity will respond in writing or e-mail to any request for clarification, within seven days provided that such request is received no later than twenty-one (21) days prior to the deadline for submission of Bids as specified in ITB Sub-Clause 4.2.1[Deadline for Submission of Bids]. The clarification issued, including a description of the inquiry but without identifying its source shall also be placed on the State Public Procurement Portal and should the Procuring Entity deem it necessary to amend the Bidding Document as a result of a clarification, it shall do so following the procedure under ITB Clause 2.3 [Amendment of Bidding Document] through an addendum which shall form part of the Bidding Document.
		2.2.2	The Bidder or his authorized representative is invited to attend the Pre- Bid Conference, if provided for in the BDS. The purpose of the Pre- Bid Conference will be to clarify issues and to answer questions on any matter related to this procurement that may be raised at that stage. If required, a conducted site visit may be arranged by the Procuring Entity.

		2.2.3	The Bidder is requested, to submit questions in writing, to reach the Procuring Entity not later than one week before the date of Pre-Bid Conference.
		2.2.4	Minutes of the Pre-Bid Conference, including the text of the questions raised, and the responses given, without identifying the source, will be transmitted promptly to all Bidders who attended the Pre-Bid Conference and shall also be placed on the State Public Procurement Portal and the e-procurement portal. Any modification to the Bidding Document that may become necessary as a result of the Pre-Bid Conference shall be made by the Procuring Entity exclusively through the issue of an addendum (part of Bid document) and not through the minutes of the Pre-Bid Conference.
		2.2.5	At any time prior to the deadline for submission of the Bids, the Procuring Entity, suo motto, may also amend the Bidding Document, if required, by issuing an addenda which will form part of the Bidding Document.
		2.2.6	Non-attendance at the Pre-Bid Conference will not be a cause for disqualification of a Bidder.
2.3	Amendment of Bidding Document	2.3.1	Any addendum issued shall be part of the Bidding Document and shall be uploaded on the State Public Procurement Portal and the e-procurement portal.
		2.3.2	To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Procuring Entity may, at its discretion, extend the deadline for the submission of the Bids, pursuant to ITB Sub-Clause 4.2 [Deadline for Submission of Bids], under due publication on the State Public Procurement Portal and the e-procurement portal and newspapers.
3. Preparation of Bids			
3.1	Cost of Bidding	3.1.1	The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
		3.1.2	<p>The Bidder shall furnish the scanned attested copies of following documents with its Bid:-</p> <ul style="list-style-type: none"> i. Partnership Deed and valid registration certificate with the Registrar of Firms in case of Partnership Firms. Power of Attorney in favour of the partner signing/submitting the Bid, authorizing him to represent all partners of the firm. ii. VAT/ Sales Tax registration certificate and VAT/Sales Tax clearance certificate from the concerned Commercial Taxes Officer and Permanent Account Number (PAN) given by the Income Tax Department. iii. Address of residence and office, telephone numbers e-mail address in case of sole Proprietorship. iv. Certificate of Registration and Memorandum of

			<p>Association issued by Registrar of Companies in case of a registered company and in case of any other statutory or registered body, certificate of incorporation or registration issued by concerned authorities. Power of attorney in favour of the person signing the Bid.</p> <p>v. Where permitted to bid as Joint Venture, Consortium or Association, letter of formal intent to enter in to an agreement or an existing agreement in the form of a Joint Venture, Consortium or Association.</p>
3.2	Language of Bid	3.2.1	<p>The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Procuring Entity, shall be written in English/ Hindi or a language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages duly accepted by the Bidder in English/ Hindi or the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.</p>
3.3	Documents Comprising the Bid	3.3.1	<p>The Bid shall comprise of two covers, one containing the Technical Bid/ Proposal and the other the Financial or Price Bid/ Proposal.</p> <p>One more cover containing scanned copies of proof of payment in form specified in Bid Data Sheet, of the price of Bidding Document, processing fee and Bid Security/ Bid Securing Declaration shall be enclosed separately.</p>
		3.3.2	<p>The Technical Bid/ Proposal shall contain the following :</p> <ol style="list-style-type: none"> Technical Bid/ Proposal Submission Sheet and Technical Bid containing the filled up Bidding Forms and Declarations related to Technical Bid and Code of Integrity given in Section IV [Bidding Forms]; proof of payment of price of Bidding Document, processing fee, Bid Security, in accordance with ITB Clause 3.10; written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB Clause 3.11; documentary evidence in accordance with ITB Clause 3.7 establishing the Bidder's eligibility to bid; documentary evidence in accordance with ITB Clause 3.8 establishing the Bidder's qualifications to perform the contract if its Bid is accepted; Drawings/ designs in support of the Works to be executed; the Notice Inviting Bids; any other document required in the BDS; and others considered necessary to strengthen the Bid submitted.

		3.3.3	The Financial Bid/ Price Proposal shall contain the following : Financial Bid/ Price Proposal Submission Sheet and the applicable Price Schedules, in accordance with ITB Clauses 3.4, 3.5; Any other document required in the BDS.
3.4	Bid Submission Sheets and Price Schedules	3.4.1	The Bidder shall submit the Technical Bid and Financial Bid using the Bid Submission Sheets provided in Section IV [Bidding Forms]. These forms must be completed without any alterations to their format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.
		3.4.2	The Bidder shall submit as part of the Financial Bid, the Price Schedules for Works, using the forms provided in Section IV [Bidding Forms].
3.5	Bid Prices	3.5.1	i. In case of Item Rate Contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Procuring Entity but will have to be executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities. ii. In case of Percentage Rate Contracts, combined single percentage above or below must be quoted by the Bidder for all items of the Bill of Quantities. iii. In case of Lump Sum Contracts, only Total Price which the Bidder wants to charge for the entire Works with all its contingencies in accordance with drawings and specifications shall be quoted by the Bidder. A Schedule of Rates shall be specified in the Bid Data Sheet in order to regulate the amount to be added to or deducted from the fixed sum on account of additions and alterations not covered by the Contract. Payments shall be linked to various stages of completion of the Works specified in Activity Schedule given in Bid Data Sheet.
		3.5.2	Prices quoted by the Bidder shall be fixed during the Bidder's Performance of the Contract and not subject to variation on any account, unless otherwise specified in the BDS. A Bid submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected, pursuant to ITB Clause 5.7 [Responsiveness of Bids]. However, if in accordance with the BDS, prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract, a Bid submitted with a fixed price quotation shall not be rejected, but the price adjustment shall be treated as zero.
		3.5.3	All duties, taxes and other levies payable by the Bidder under the contract, or for any other cause, shall be included in the rates and prices, and the total Bid Price submitted by the Bidder.

3.6	Currencies of Bid.	3.6.1	The unit rates and the prices shall be quoted by the Bidder entirely in Indian Rupees unless otherwise specified in BDS. All payments shall be made in Indian Rupees only, unless otherwise specified in the BDS.
3.7	Documents Establishing the Eligibility of the Bidder	3.7.1	To establish their eligibility in accordance with ITB Clause 1.4 [Eligible Bidders], Bidders shall: complete the eligibility declarations in the Bid Submission Sheet and Declaration Form included in Section IV [Bidding Forms]; if the Bidder is an existing or intended Joint Venture [JV], Consortium or Association in accordance with ITB Sub-Clause 1.4.1, shall submit a copy of the Agreement, or a letter of intent to enter into such Agreement. The respective document shall be signed by all legally authorized signatories of all the parties to the existing or intended JV, Consortium or Association as appropriate; and the existing or intended JV shall authorize an individual/ partner in one of the firms as lead partner of the JV to act and commit all the partners of JV for the Bid.
3.8	Documents Establishing the Qualifications of the Bidder	3.8.1	To establish its qualifications to perform the Contract, the Bidder shall submit as part of its Technical Proposal the documentary evidence indicated for each qualification criteria specified in Section III, [Evaluation and Qualification Criteria].
3.9	Period of Validity of Bids	3.9.1	Bids shall remain valid for 180 days or the period specified in the BDS after the Bid submission deadline date as specified by the Procuring Entity. A Bid valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.
		3.9.2	In exceptional circumstances, prior to the expiration of the Bid validity period, the Procuring Entity may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. The Bid Security or a Bid Securing Declaration in accordance with ITB Clause 3.10 [Bid Security] shall also be got extended for thirty days beyond the dead line of the extended validity period. A Bidder may refuse the request without forfeiting its Bid Security or a Bid Securing Declaration. A Bidder granting the request shall not be permitted to modify its Bid.
3.10	Bid Security	3.10.1	Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, a Bid Security for the amount specified in the BDS.
		3.10.2	Bid Security shall be 2% of the value of the Works indicated in the NIB. For bidders registered with the Procuring Entity, the bid security shall be 0.5% of the value of works indicated in the NIB. The bid security shall be in Indian Rupees, if not otherwise specified in the BDS.
		3.10.3	The Bid Security may be given in the form of a banker's Cheque or demand draft or bank guarantee of a Scheduled Bank in India, in specified format, or deposited through eGRAS/ net banking, if permitted.

		3.10.4	In lieu of Bid Security, a Bid Securing Declaration shall be taken from Government Departments and State Government Public Sector Enterprises, Autonomous bodies, Registered Societies, Cooperative Societies which are owned or controlled or managed by the State Government, Public Sector Enterprises of Central Government. For the Bid Securing Declaration the Bidder shall use the form included in Section IV [Bidding Forms].
		3.10.5	Scanned copy of Bid Security instrument or a Bid Securing Declaration shall necessarily accompany the sealed Bid. Any Bid not accompanied by Bid Security or Bid Securing Declaration, if not exempted, shall be liable to be rejected.
		3.10.6	Bid Security of a Bidder lying with the Procuring Entity in respect of other Bids awaiting decision shall not be adjusted towards Bid Security for the this Bid. The Bid Security originally deposited may, however be taken into consideration in case Bids are re-invited.
		3.10.7	The issuer of the Bid Security and the confirmer, if any, of the Bid Security, as well as the form and terms of the Bid Security, must be acceptable to the Procuring Entity.
		3.10.8	Prior to submitting its Bid, a Bidder may request the Procuring Entity to confirm the acceptability of a proposed issuer of a Bid Security or of a proposed confirmer, if different than as specified in ITB Clause 3.10.3. The Procuring Entity shall respond promptly to such a request.
		3.10.9	The bank guarantee presented as Bid Security shall be got confirmed from the concerned issuing bank. However, the confirmation of the acceptability of a proposed issuer or of any proposed confirmer does not preclude the Procuring Entity from rejecting the Bid Security on the ground that the issuer or the confirmer, as the case may be, has become insolvent or is under liquidation or has otherwise ceased to be creditworthy.
		3.10.10	The Bid Security of unsuccessful Bidders shall be refunded soon after final acceptance of successful Bid and signing of Contract Agreement and submitting Performance Security by successful Bidder pursuant to ITB Clause 6.4 [Performance Security].

		3.10.11	<p>The Bid Security taken from a Bidder shall be forfeited in the following cases, namely:-</p> <ul style="list-style-type: none"> i. when the Bidder withdraws or modifies his Bid after opening of Bids; or ii. when the Bidder does not execute the agreement in accordance with ITB Clause 6.3 [Signing of Contract] after issue of letter of acceptance/ placement of Work order within the specified time period; or iii. when the Bidder fails to commence the Works as per Work Order within the time specified; or iv. when the Bidder does not deposit the Performance Security in accordance with ITB Clause 6.4 [Performance Security]; in the prescribed time limit after the work order is placed; v. if the Bidder breaches any provision of the Code of Integrity prescribed for Bidders in the Act and Chapter VI of the Rules or as specified in ITB Clause 1.3 [Code of Integrity]; or vi. if the Bidder does not accept the correction of its Bid Price pursuant to ITB Sub-Clause 5.5 [Correction of Arithmetical Errors].
		3.10.12	<p>In case of the successful bidder, the amount of Bid Security may be adjusted in arriving at the amount of the Performance Security, or refunded if the successful bidder furnishes the full amount of Performance Security. No interest will be paid by the Procuring Entity on the amount of Bid Security.</p>
		3.10.13	<p>The Procuring Entity shall promptly refund the Bid Security of the Bidders at the earliest of any of the following events, namely:-</p> <ul style="list-style-type: none"> i. the expiry of validity of Bid Security; ii. the execution of agreement for procurement and Performance Security is furnished by the successful bidder; iii. the cancellation of the procurement process; or iv. the withdrawal of Bid prior to the deadline for presenting Bids, unless the Bidding Document stipulates that no such withdrawal is permitted.
		3.10.14	<p>The Bid Security of a Joint Venture, Consortium or Association must be in the name of the Joint Venture, Consortium or Association that submits the Bid. If the Joint Venture, Consortium or Association has not been legally constituted at the time of Bidding, the members of the proposed consortium or JV shall enter in to an Agreement to form a legally constituted</p>

			JV after the issue of Letter of Acceptance / Letter of Intent to them and also declare a partner as the lead partner in whose name the Bid Security may be submitted.
3.11	Format and Signing of Bid	3.11.1	All pages of the Technical and Financial Bid shall be digitally signed by the Bidder or authorized signatory on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. In case of a Joint Venture, Consortium or Association, if the Joint Venture, Consortium or Association has not been legally constituted at the time of Bidding, all the members of the proposed Joint Venture, Consortium or Association shall digitally sign the Bid.
4. Submission and Opening of Bids			
4.1	Sealing and Marking of Bids	4.1.1	Bidders shall submit their Bids to the Procuring Entity electronically only on the e-procurement portal, eproc.raj.nic.in. In submission of their Bids, the Bidders should follow the step by step instructions given on the e-procurement portal.
		4.1.2	The Bidder shall enclose the Technical Bid and the Financial Bid in separate covers. The proof of payment of price of Bidding Document, processing fee and Bid Security shall be enclosed in third cover. The price of Bidding Document and Bid Security shall be paid in the name of the Procuring Entity and the processing fee shall be paid in the name of RISL.
4.2	Deadline for Submission of Bids	4.2.1	Bids shall be submitted electronically only upto the time and date specified in the Notice Inviting Bids and BDS or an extension issued thereof.
4.3	Withdrawal, Substitution and Modification of Bids	4.3.1	A Bidder may withdraw, substitute or modify its Bid after it has been submitted by submitting electronically on the e-procurement portal a written Withdrawal/ Substitutions/ Modifications etc. Notice on the e-procurement portal, duly digitally signed by the Bidder or his authorized representative, and shall include a copy of the authorization in accordance with ITB Sub-Clause 3.11.1 [Format and Signing of Bid]. The corresponding Withdrawal, Substitution or Modification of the Bid must accompany the respective written Notice. All Notices must be received by the Procuring Entity on the e-procurement portal prior to the deadline specified for submission of Bids in accordance with ITB Sub-Clause 4.2. [Deadline for Submission of Bids].
		4.3.2	No Bid shall be withdrawn, substituted or modified in the interval between the deadline for submission of the Bid and the expiration of the period of Bid validity specified in ITB Clause 3.9.[Period of Validity of Bids] or any extension thereof.
4.4	Bid Opening	4.4.1	The electronic Technical Bids shall be opened by the Bids opening committee constituted by the Procuring Entity at the time, date and place specified in the Bid Data Sheet in the presence of the Bidders or their authorized representatives, who choose to be present.

		4.4.2	The Bids opening committee may co-opt experienced persons in the committee to conduct the process of Bid opening.
		4.4.3	The Bidders may choose to witness the electronic Bid opening procedure online.
		4.4.4	The Financial Bids shall be kept unopened until the time of opening of the Financial Bids. The date, time, and location of electronic opening of the Financial Bids shall be intimated to the bidders who are found qualified by the Procuring Entity in evaluation of their Technical Bids.
		4.4.5	The Bids opening committee shall prepare a list of the Bidders or their representatives attending the opening of Bids and obtain their signatures on the same. The list shall also contain the representative's name and telephone number and corresponding Bidders' names and addresses. The authority letters brought by the representatives shall be attached to the list. The list shall be signed by all the members of Bids opening committee with date and time of opening of the Bids.
		4.4.6	<p>First, covers marked as "WITHDRAWAL" shall be opened, read out, and recorded and the covers containing the corresponding Technical Bids and Financial Bids shall not be opened. No Bid shall be permitted to be withdrawn unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is readout and recorded at Bid opening. If the withdrawal notice is not accompanied by the valid authorization, the withdrawal shall not be permitted and the corresponding Technical Bid shall be opened.</p> <p>Next, covers marked as "SUBSTITUTION Technical Bid" shall be opened, read out, recorded. The covers containing the Substitution Technical Bids and/ or Substitution Financial Bids shall be exchanged for the corresponding covers being substituted. Only the Substitution Technical Bids shall be opened, read out, and recorded. Substitution Financial Bids will remain unopened in accordance with ITB Sub-Clause 4.4.4. No Bid shall be substituted unless the corresponding substitution notice contains a valid authorisation to request the substitution and is read out and recorded at Bid opening.</p> <p>Covers marked as "MODIFICATION Technical Bid" shall be opened thereafter, read out and recorded with the corresponding Technical Bids. No Technical Bid and/ or Financial Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Financial Bids, both Original as well as Modification, will remain unopened in accordance with ITB Sub-Clause 4.4.4.</p>

		4.4.7	<p>All other covers containing the Technical Bids shall be opened one at a time and the following read out and recorded-</p> <ul style="list-style-type: none"> i. the name of the Bidder; ii. whether there is a modification or substitution; iii. whether proof of payment of Bid Security or Bid Securing Declaration, if required, payment of price of the Bidding Document and processing fee have been enclosed; iv. any other details as the Bids opening committee may consider appropriate. <p>After all the Bids have been opened, their hard copies shall be printed and shall be initialed and dated on the first page and other important papers of each Bid by the members of the Bids opening committee.</p>
		4.4.8	<p>Only Technical Bids shall be read out and recorded at the bid opening and shall be considered for evaluation. No Bid shall be rejected at the time of opening of Technical Bids except Alternative Bids (if not permitted) and Bids not accompanied with the proof of payment of the required price of Bidding Document, processing fee and Bid Security.</p>
		4.4.9	<p>The Bids opening committee shall prepare a record of opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, modification, or alternative offer (if they were permitted), any conditions put by Bidder and the presence or absence of the price of Bidding Document, processing fee and Bid Security. The Bidders or their representatives, who are present, shall sign the record. The members of the Bids opening committee shall also sign the record with date.</p>
		4.4.10	<p>After completion of the evaluation of the Technical Bids, the Procuring Entity shall invite Bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified to attend the electronic opening of the Financial Bids. The date, time, and location of the opening of Financial Bids will be intimated in writing by the Procuring Entity. Bidders shall be given reasonable notice of the opening of Financial Bids.</p>
		4.4.11	<p>The Procuring Entity shall notify Bidders in writing whose Technical Bids have been rejected on the grounds of being substantially non-responsive and not qualified in accordance with the requirements of the Bidding Document.</p>
		4.4.12	<p>The Bids opening committee shall conduct the electronic opening of Financial Bids of all Bidders who submitted substantially responsive Technical Bids and have qualified in evaluation of Technical Bids, in the presence of Bidders or their</p>

			representatives who choose to be present at the address, date and time specified by the Procuring Entity.
		4.4.13	<p>All covers containing the Financial Bids shall be opened one at a time and the following read out and recorded-</p> <ul style="list-style-type: none"> i. the name of the Bidder; ii. whether there is a modification or substitution; iii. the Bid Prices; iv. any other details as the Bids opening committee may consider appropriate. <p>After all the Bids have been opened, their hard copies shall be printed and shall be initialed and dated on the first page of the each Bid by the members of the Bids opening committee. All the pages of the Price Schedule and letters, Bill of Quantities attached shall be initialed and dated by the members of the committee. Key information such as prices, completion period, etc. shall be encircled and unfilled spaces in the Bids shall be marked and signed with date by the members of the Bids opening committee.</p>
		4.4.14	The Bids opening committee shall prepare a record of opening of Financial Bids that shall include as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification, the Bid Price, any conditions, any discounts and alternative offers (if they were permitted). The Bidders or their representatives, who are present, shall sign the record. The members of the Bids opening committee shall also sign the record with date.
5. Evaluation and Comparison of Bids			
5.1	Confidentiality	5.1.1	Information relating to the examination, evaluation, comparison, and post-qualification of Bids, and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.
		5.1.2	Any attempt by a Bidder to influence the Procuring Entity in its examination of qualification, evaluation, comparison of the Bids or Contract award decisions may resulting in the rejection of its Bid, in addition to the legal action which may be taken by the Procuring Entity under the Act and the Rules.
		5.1.3	Notwithstanding ITB Sub-Clause 5.1.2 [Confidentiality], from the time of opening the Bid to the time of Contract award, if any Bidder wishes to contact the Procuring Entity on any matter related to the Bidding process, it shall do so in writing.

		5.1.4	In addition to the restrictions specified in section 49 of the Act, the Procuring Entity, while procuring a subject matter of such nature which requires the procuring Entity to maintain confidentiality, may impose condition for protecting confidentiality of such information.
5.2	Clarification of Technical or Financial Bids	5.2.1	To assist in the examination, evaluation, comparison and qualification of the Technical or Financial Bids, the Bid evaluation committee may, at its discretion, ask any Bidder for a clarification regarding his Bid. The committee's request for clarification and the response of the Bidder shall be in writing.
		5.2.2	Any clarification submitted by a Bidder with regard to his Bid that is not in response to a request by the Bid evaluation committee shall not be considered.
		5.2.3	No change in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetical errors discovered by the Bid evaluation committee in the evaluation of the financial Bids.
		5.2.4	No substantive change to qualification information or to a submission, including changes aimed at making an unqualified Bidder, qualified or an unresponsive submission, responsive shall be sought, offered or permitted.
5.3	Deviations, Reservations and Omissions in Technical or Financial Bids	5.3.1	During the evaluation of Technical or Financial Bids, the following definitions apply: i. "Deviation" is a departure from the requirements specified in the Bidding Document; ii. "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and iii. "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.
5.4	Nonmaterial Non conformities in Technical or Financial Bids	5.4.1	Provided that a Technical or Financial Bid is substantially responsive, the Procuring Entity may waive any nonconformities (with recorded reasons) in the Bid that do not constitute a material deviation, reservation or omission.
		5.4.2	Provided that a Technical or Financial Bid is substantially responsive, the Procuring Entity may request the Bidder to submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Bid related to documentation requirements. Request for information or documentation on such nonconformities shall not be related to any aspect of the Financial Proposal of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

		5.4.3	<p>* Provided that a Technical or Financial Bid is substantially responsive, the Procuring Entity will rectify nonmaterial nonconformities or omissions (with recorded reasons). To this effect, the Bid Price shall be adjusted during evaluation of Financial Proposals for comparison purposes only, to reflect the price of the missing or non- conforming item or component. The adjustment shall be made using the method indicated in Section III, Evaluation and Qualification Criteria.</p> <p>* [This ITB Sub-Clause should be kept only when considered necessary]</p>
5.5	Correction of Arithmetical Errors in Financial Bid	5.5.1	<p>Provided that a Financial Bid is substantially responsive, the Bid evaluation committee shall correct arithmetical errors during evaluation of Financial Bid on the following basis:</p> <ul style="list-style-type: none"> i. if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Procuring Entity there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected; ii. if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and iii. if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (i) and (ii) above.
		5.5.2	<p>If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its Bid Security shall be forfeited or its Bid Securing Declaration shall be executed.</p>
5.6	Preliminary Examination of Technical or Financial Bids	5.6.1	<p>The Procuring Entity shall examine the Technical or Financial Bids to confirm that all documents and technical documentation requested in ITB Sub-Clause 3.3 [Documents Comprising the Bid] have been provided, and to determine the completeness of each document submitted.</p>

		5.6.2	<p>The Procuring Entity shall confirm, following the opening of the Technical or Financial Bids, that the following documents and information have been provided :</p> <ul style="list-style-type: none"> i. Bid is signed, as per the requirements listed in the Bidding documents; ii. Bid has been sealed as per instructions provided in the Bidding documents; iii. Bid is valid for the period, specified in the Bidding documents; iv. Bid is accompanied by Bid Security or Bid securing declaration; v. Bid is unconditional and the Bidder has agreed to give the required performance Security; vi. Price Schedules in the Financial Bids are in accordance with ITB Clause 3.4 [Bid Submission Sheets and Price Schedules]; vii. written confirmation of authorization to commit the Bidder; viii. Declaration by the Bidder in compliance of Section 7 and 11 of the Act; and ix. other conditions, as specified in the Bidding Document are fulfilled.
5.7	Responsiveness of Technical or Financial Bids	5.7.1	The Procuring Entity's determination of the responsiveness of a Technical or Financial Bid is to be based on the contents of the Bid itself, as defined in ITB Sub-Clause 3.3 [Documents Comprising the Bid].
		5.7.2	<p>A substantially responsive Technical or Financial Bid is one that meets without material deviation, reservation, or omission to all the terms, conditions, and specifications of the Bidding Document. A material deviation, reservation, or omission is one that:</p> <p>(a) if accepted, would-</p> <ul style="list-style-type: none"> i. affect in any substantial way the scope, quality, or performance of the Goods and Related Services specified in Section V, Schedule of Supply; or ii. limits in any substantial way, inconsistent with the Bidding Document ,the Procuring Entity's rights or the Bidder's obligations under the proposed Contract; or <p>(b) if rectified, would unfairly affect the competitive</p>

			position of other Bidders presenting substantially responsive Bids.
		5.7.3	The Procuring Entity shall examine the technical aspects of the Bid in particular, to confirm that requirements of Section V, Procuring Entity's Requirements have been met without any material deviation, reservation, or omission.
		5.7.4	If a Technical or Financial Bid is not substantially responsive to the Bidding Document, it shall be rejected by the Procuring Entity and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.
5.8	Examination of Terms and Conditions of the Technical or Financial Bids	5.8.1	The Procuring Entity shall examine the Bids to confirm that all terms and conditions specified in the GCC and the SCC have been accepted by the Bidder without any material deviation or reservation.
		5.8.2	The Procuring Entity shall evaluate the technical aspects of the Bid submitted in accordance with ITB Clauses 3.3 [Documents Comprising the Bid] and to confirm that all requirements specified in Section V [Procuring Entity's Requirements] of the Bidding Document and all amendments or changes requested by the Procuring Entity in accordance with ITB Clause 2.3 [Amendment of Bidding Document] have been met without any material deviation or reservation.
5.9	Evaluation of Qualification of Bidders in Technical Bids	5.9.1	The determination of qualification of a Bidder in evaluation of Technical Bids shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 3.8 [Documents Establishing the Qualifications of the Bidder] and in accordance with the qualification criteria indicated in Section III [Evaluation and Qualification Criteria]. Factors not included in Section III, shall not be used in the evaluation of the Bidder's qualification.
5.10	Evaluation of Financial Bids	5.10.1	The Procuring Entity shall evaluate each Financial Bid, the corresponding Technical Bid of which has been determined to be substantially responsive
		5.10.2	To evaluate a Financial Bid, the Procuring Entity shall only use all the criteria and methodologies defined in this Clause and in Section III, Evaluation and Qualification Criteria. No other criteria or methodology shall be permitted.
		5.10.3	To evaluate a Financial Bid, the Procuring Entity shall consider the following: <ul style="list-style-type: none"> i. the Bid Price quoted in the Financial Bid; ii. price adjustment for correction of arithmetical errors in accordance with ITB Clause 5.5 [Correction of Arithmetical Errors]; iii. adjustment of bid prices due to rectification of nonmaterial nonconformities or omissions in accordance with ITB Sub Clause 5.4.3

			[Nonmaterial Nonconformities in Bids], if applicable.
		5.10.4	If the Bid, which results in the lowest evaluated Bid Price, is considered to be seriously unbalanced, or front loaded, in the opinion of the Procuring Entity, the Procuring Entity may require the Bidder to produce detailed rate analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those rates with the construction methods and schedule proposed. After evaluation of the rate analysis, taking into consideration, the schedule of estimated Contract payments, the Procuring Entity may require that the amount of the Performance security be increased at the cost of the Bidder to a level sufficient to protect the Procuring Entity against financial loss in the event of default of the successful Bidder under the Contract.
5.11	Comparison of Bids	5.11.1	The Procuring Entity shall compare all substantially responsive Financial Bids to determine the lowest-evaluated Financial Bid in accordance with ITB Sub-Clause 5.10 [Evaluation of Financial Bids].
5.12	Negotiations	5.12.1	To the extent possible, no negotiations shall be conducted after the pre-Bid stage. All clarifications needed to be sought shall be sought in the pre-Bid stage itself.
		5.12.2	Negotiations may, however, be undertaken only with the lowest Bidder under the following circumstances- i. when ring prices have been quoted by the Bidders for the subject matter of procurement; or ii. when the rates quoted vary considerably and considered much higher than the prevailing market rates.
		5.12.3	The Bid evaluation committee shall have full powers to undertake negotiations. Detailed reasons and results of negotiations shall be recorded in the proceedings.
		5.12.4	The lowest Bidder shall be informed about negotiations in writing either through messenger or by registered letter and e-mail (if available). A minimum time of seven days shall be given for calling negotiations. In case of urgency, the Bid evaluation committee, after recording reasons, may reduce the time, provided the lowest Bidder has received the intimation and consented to holding of negotiations.

		5.12.5	Negotiations shall not make the original offer made by the Bidder inoperative. The Bid evaluation committee shall have option to consider the original offer in case the Bidder decides to increase rates originally quoted or imposes any new terms or conditions.
		5.12.6	In case of non-satisfactory achievement of rates from lowest Bidder, the Bid evaluation committee may choose to make a written counter offer to the lowest Bidder and if this is not accepted by him, the committee may decide to reject and re-invite Bids or to make the same counter-offer first to the second lowest Bidder, then to the third lowest Bidder and so on in the order of their initial standing in the bid evaluation and work order be awarded to the Bidder who accepts the counter-offer.
		5.12.7	In case the rates even after the negotiations are considered very high, fresh Bids shall be invited.
5.13	Procuring Entity's Right to Accept Any Bid, and to Reject Any or All Bids	5.13.1	The Procuring Entity reserves the right to accept or reject any Bid, and to annul the Bidding process and reject all Bids at any time prior to Contract award without assigning any reasons thereof and without there by incurring any liability to the Bidders.
6. Award of Contract			
6.1	Procuring Entity's Right to Vary Quantities	6.1.1	If the Procuring Entity does not procure any subject matter of procurement or procures less than the quantity specified in the Bidding Document due to change in circumstances, the Bidder shall not be entitled for any claim or compensation except otherwise provided in the Bidding Document.
		6.1.2	Order for additional quantity of an item of the Works up to 50 percent of the original quantity of that item in the Bill of Quantities and for extra items not provided for in the Bill of Quantities may be given but the amount of the additional quantities and extra items, taken together, shall not exceed 50 percent of the Contract Price.
6.2	Acceptance of the successful Bid and award of contract	6.2.1	The Procuring Entity after considering the recommendations of the Bid Evaluation Committee and the conditions of Bid, if any, financial implications, samples, test reports, etc., shall accept or reject the successful Bid.
		6.2.2	Before award of the Contract, the Procuring Entity shall ensure that the price of successful Bid is reasonable and consistent with the required specifications.
		6.2.3	A Bid shall be treated as successful only after the competent authority has approved the procurement in terms of that Bid.
		6.2.4	The Procuring Entity shall award the contract to the Bidder whose offer has been determined to be the lowest in accordance with the evaluation criteria set out in the Bidding Document if the Bidder has been determined to be qualified to perform the contract satisfactorily on the basis of qualification criteria fixed

			for the Bidders in the Bidding Document for the subject matter of procurement.
		6.2.5	Prior to the expiration of the period of validity of Bid, the Procuring Entity shall inform the successful Bidder in writing, by registered post or email, that its Bid has been accepted.
		6.2.6	If the issuance of formal letter of acceptance (LOA) is likely to take time, in the meanwhile a Letter of Intent (LOI) may be sent to the Bidder. The acceptance of an offer is complete as soon as the letter of acceptance or letter of intent is posted and/or sent by email (if available) to the address of the Bidder given in the Bidding Document.
6.3	Signing of Contract	6.3.1	In the written intimation of acceptance of its Bid sent to the successful Bidder, it shall also be requested to execute an agreement in the format given in the Bidding Document on a non-judicial stamp of requisite value at his cost and deposit the Performance Security or a Performance Security Declaration, if applicable, within a period specified in the BDS or where the period is not specified in the BDS, then within fifteen days from the date on which the LOA or LOI is dispatched to the Bidder. In case the successful bidder is a JV still to be legally constituted, all parties to the JV shall sign the Agreement.
		6.3.2	If the Bidder, whose Bid has been accepted, fails to sign a written procurement contract or fails to furnish the required Performance Security or Performance Security Declaration within the specified time period, the Procuring Entity shall forfeit the Bid Security of the successful bidder / execute the Bid Securing Declaration and take required action against it as per the provisions of the Act and the Rules.
		6.3.3	The Bid Security, if any, of the Bidders whose Bids could not be accepted shall be refunded soon after the contract with the successful Bidder is signed and his Performance Security is obtained. Until a formal contract is executed, LOA or LOI shall constitute a binding contract.
6.4	Performance Security	6.4.1	Performance Security shall be solicited from the successful Bidder except State Govt. Departments and undertakings, corporations, autonomous bodies, registered societies, co-operative societies which are owned or controlled or managed by the State Government and undertakings of Central Government. However, a Performance Security Declaration shall be taken from them. The State Government may relax the provision of Performance Security in particular procurement.
		6.4.2	(i) The amount of Performance Security shall be ten percent, or as specified in the BDS, of the amount of the Work Order. The currency of Performance Security shall be Indian Rupees, if otherwise not specified in BDS. (ii) If the Bid, which results in the lowest evaluated bid price, is seriously unbalanced or front loaded in the opinion of the Procuring Entity, the Procuring Entity

			may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analysis, taking into consideration the schedule of estimated Contract payments, the Procuring Entity may require that the amount of the performance security be increased (to a maximum of 20% of the bid value of such items) at the expense of the Bidder to a level sufficient to protect the Procuring Entity against financial loss in the event of default of the successful Bidder under the Contract.
		6.4.3	<p>Performance Security shall be furnished in one of the following forms as applicable-</p> <p>(a) Deposit through eGRAS; or</p> <p>(b) Bank Draft or Banker's Cheque of a Scheduled Bank in India; or</p> <p>(c) National Savings Certificates and any other script/ instrument under National Savings Schemes for promotion of small savings issued by a Post Office in Rajasthan, if the same can be pledged under the relevant rules. They shall be accepted at their surrender value at the time of Bid and formally transferred in the name of the Procuring Entity with the approval of Head Post Master; or</p> <p>(d) Bank guarantee. It shall be got verified from the issuing bank. Other conditions regarding bank guarantee shall be same as specified in ITB Sub-Clause 3.10 [Bid Security]; or</p> <p>(e) Fixed Deposit Receipt (FDR) of a Scheduled Bank. It shall be in the name of the Procuring Entity on account of Bidder and discharged by the Bidder in advance. The Procuring Entity shall ensure before accepting the Fixed Deposit Receipt that the Bidder furnishes an undertaking from the bank to make payment/ premature payment of the Fixed Deposit Receipt on demand to the Procuring Entity without requirement of consent of the Bidder concerned. In the event of forfeiture of the Performance Security, the Fixed Deposit shall be forfeited along with interest earned on such Fixed Deposit.</p> <p>(f) The successful Bidder at the time of signing of the Contract agreement, may submit option for deduction of Performance Security from his each running and final bill @ 10% of the amount of the bill.</p>
		6.4.4	Performance Security furnished in the form of a document mentioned at options (a) to (e) of Sub-Clause 6.4.3 above, shall remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the Bidder, including operation and / or maintenance and defect liability period, if any.
		6.4.5	Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Procuring Entity may either cancel the

			procurement process or if deemed appropriate, award the Contract at the rates of the lowest Bidder, to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Procuring Entity to be qualified to perform the Contract satisfactorily.
		6.4.6	<p>Forfeiture of Performance Security: Amount of Performance Security in full or part may be forfeited in the following cases:-</p> <ul style="list-style-type: none"> i. when the Bidder does not execute the agreement in accordance with ITB Clause 6.3 [Signing of Contract] within the specified time; after issue of letter of acceptance; or ii. when the Bidder fails to commence the Works as per Work order within the time specified; or iii. when the Bidder fails to complete Contracted Works satisfactorily within the time specified; or iv. when any terms and conditions of the contract is breached; or v. to adjust any established dues against the Bidder from any other contract with the Procuring Entity; or vi. if the Bidder breaches any provision of the Code of Integrity prescribed for the Bidders specified in the Act, Chapter VI of the Rules and this Bidding Document. vii. Notice of reasonable time will be given in case of forfeiture of Performance Security. The decision of the Procuring Entity in this regard shall be final.
7. Redressal of Grievances during Procurement Process (Appeals)			
7	Grievance handling procedure during procurement process	7.1	Any grievance of a Bidder pertaining to the procurement process shall be by way of filing an appeal to the First or Second Appellate Authority, as the case may be, as specified in the BDS, in accordance with the provisions of chapter III of the Act and chapter VII of the Rules and as given in Appendix A to these ITB.

Appendix A: Grievance Handling Procedure during Procurement Process (Appeals)

(1) Filing an appeal.- If any Bidder or prospective Bidder is aggrieved that any decision, action or omission of the Procuring Entity is in contravention to the provisions of the Act or the Rules or the Guidelines issued there under, he may file an appeal to First or Second Appellate Authority, as the case may be, as may be designated for the purpose,

within a period of ten days or such other period as may be specified in the pre-qualification documents, Bidder registration documents or Bidding documents, as the case may be, from the date of such decision or action, omission, as the case may be, clearly giving the specific ground or grounds on which he feels aggrieved:

Provided that after the declaration of a Bidder as successful in terms of section 27 of the Act, the appeal may be filed only by a Bidder who has participated in procurement proceedings:

Provided further that in case a Procuring Entity evaluates the technical Bid before the opening of the financial Bid, an appeal related to the matter of financial Bid may be filed only by a Bidder whose technical Bid is found to be acceptable.

(2) Appeal not to lie in certain cases. - No appeal shall lie against any decision of the Procuring Entity relating to the following matters, namely:-

- a) determination of need of procurement;
- b) provisions limiting participation of Bidders in the Bid process;
- c) the decision of whether or not to enter into negotiations;
- d) cancellation of a procurement process;
- e) applicability of the provisions of confidentiality.

(3) Form of Appeal.-

- a) An appeal under sub-section (1) or (4) of section 38 shall be in the annexed Form along with as many copies as there are respondents in the appeal.
- b) Every appeal shall be accompanied by an order appealed against, if any affidavit verifying the facts stated in the appeal and proof of payment of fee.
- c) Every appeal may be presented to First Appellate Authority or Second Appellate Authority, as the case may be, in person or through registered post or authorized representative.

(4) Fee for filing appeal.-

- a) Fee for first appeal shall be rupees two thousand five hundred and for second appeal shall be rupees ten thousand, which shall be non-refundable.
- b) The fee shall be paid in the form of bank demand draft or banker's Cheque of a Scheduled Bank payable in the name of Appellate Authority concerned.

(5) Procedure for disposal of appeals.-

- a) The First Appellate Authority or Second Appellate Authority, as the case may be, upon filing of appeal, shall issue notice accompanied by copy of appeal, affidavit and documents, if any, to the respondents and fix date of hearing.
- b) On the date fixed for hearing, the First Appellate Authority or Second Appellate Authority, as the case may be, shall,-
 - (i) hear all the parties to appeal present before him; and

- (ii) peruse or inspect documents, relevant records or copies thereof relating to the matter.
- c) After hearing the parties, perusal or inspection of documents and relevant records or copies thereof relating to the matter, the Appellate Authority concerned shall pass an order in writing and provide the copy of order to the parties to appeal free of cost.
- d) The order passed under sub-clause (c) above shall be placed on the State Public Procurement Portal.

Annexure

FORM No. 1

[See rule 83]

Memorandum of Appeal under the Rajasthan Transparency in Public Procurement Act, 2012

Appeal Noof

Before the (First / Second Appellate Authority)

1.Particulars of appellant:

(i)Name of the appellant:

(ii) Official address, if any:

(iii) Residential address:

2. Name and address of the respondent(s):

(1).

(2).

(3).

3. Number and date of the order appealed against
and name and designation of the officer / authority
who passed the order (enclose copy), or a
statement of a decision, action or omission of
the Procuring Entity in contravention to the provisions of
the Act by which the appellant is aggrieved:

4. If the Appellant proposes to be represented
by a representative, the name and postal address
of the representative:

5. Number of affidavits and documents enclosed with the appeal:

6. Grounds of appeal:

.....
.....
.....
..... (Supported by an affidavit)

7. Prayer:

.....
.....
.....

Place

Date

Appellant's Signature

SECTION II - BIDDING DATA

The following specific data for the works shall complement, amend, or supplement the provisions in Instructions to Bidders – Section I. Whenever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

INSTRUCTIONS TO BIDDERS CLAUSE REFERENCE

A. Introduction

ITB. 1.1.1	<p>The Number of the Invitation for Bids (NIT) is E-13 / 2016-17</p> <p>The Procuring Entity is :Udaipur Smart city Limited</p> <p>Representative of the Procuring Entity: Chief Executive Officer, Udaipur Smart city Limited</p> <p>Name of Town: Udaipur</p> <p>Name of the works : Design, construction, supply, installation, testing and commissioning and operating for 15 years under Hybrid Annuity Model (Which will include all Civil, Mechanical, electrical, instrumentation & other necessary works) of STP's (25 MLD + 10 MLD + 5 MLD) based on SBR Process (equivalent or higher process) having provision for reuse of 50% treated water of Udaipur Town (Detailed Scope of work has been defined in Section 5.)</p>									
1.1.2	<p>Period of Completion:</p> <p>The Physical Works shall be completed in its entirety within Twenty four (24) months including trial run period from the Start Date, which shall be the date of issue of the Notice to proceed or such other Start Date as may be specified in the Notice to proceed..</p>									
1.1.3	<p>Estimated Cost of work is as under:</p> <p>Total Cost of Works: Rs. 8000.00 Lacs</p> <p>break up of cost is as under (Rs in lacs.):</p>									
	<table><tr><td>1. Near Karjali House</td><td>- 5 MLD</td><td>Rs. 10 Cr.</td></tr><tr><td>2. Near FCI Godown</td><td>- 10 MLD</td><td>Rs. 20 Cr.</td></tr><tr><td>3. At Eiklingpura</td><td>- 25 MLD</td><td>Rs. 50 Cr.</td></tr></table>	1. Near Karjali House	- 5 MLD	Rs. 10 Cr.	2. Near FCI Godown	- 10 MLD	Rs. 20 Cr.	3. At Eiklingpura	- 25 MLD	Rs. 50 Cr.
1. Near Karjali House	- 5 MLD	Rs. 10 Cr.								
2. Near FCI Godown	- 10 MLD	Rs. 20 Cr.								
3. At Eiklingpura	- 25 MLD	Rs. 50 Cr.								
	<p>NOTE:-</p> <p><i>Land will be provided by UIT. Preference will be given to those who can arrange the land on their own. In the designated area, if a party be chosen to build upon its land then it shall have to surrender the land to UIT which shall be given /allotted to the firm to a token lease for the entire duration of the tender. After the expiry of the tender duration the land shall be returned to UIT.</i></p>									
	<p>The type of Contract is on Lump Sum basis for 3 sewage treatment plants on Hybrid Annuity Model.</p>									

ITB 1.4.1	Joint Ventures are permitted comprising not more than two 2 (two) firms/companies. The minimum equity under JV of lead firm should be 51% and that of other firm should 25%.
ITB 1.4.2	“Bidders of any Nationality” are permissible.
ITB 1.4.5	<p>The Bidder / both partners of JV must be a person/ private company/ organization of any State Govt./ Central Govt. / PSU / Govt Autonomous Body / Govt. Undertaking of any country.</p> <p style="text-align: center;">OR</p> <p>Any Industrial House having turnover more than 50 crore and that has experience of successfully commissioning a STP/CETP/ETP above 15 MLD either for its own use or as a CSR activity or under Public Private Partnership mode. Such a STP must be running successfully for a period of 2 years.</p> <p>PSU can participate in tender without registration</p>
ITB 1.4.8	The bidding process is open to bidders who fulfil the prescribed eligibility criteria.
ITB 1.4.9	Each bidder shall upload on-line / submit only one bid for one work. A bidder who submits or participates in more than one bid for the particular Works will be disqualified.

B. Bidding Documents

ITB 2.1.3	<p>This is an “on-line tender”. Therefore, tender documents in physical form shall not be available for sale but can be downloaded from the website and pay cost (Rs 20000/-) while submitting the filled-up Bidding document to the Procuring Entity along with the processing fee of Rs 1000/- separately in favour of RISL, Jaipur</p> <p>The bidder should submit, by date & time specified in bid document, in original, hard copies of – (i) cost of bid document as Rs. 20,000/- for each work in the form of DD/Banker's Cheque of a scheduled bank in India or eGRAS in the name of Chief Executive Officer, Udaipur Smart City Limited payable at Udaipur, (ii) Bid processing fee of Rs. 1,000/- for each work in the form of DD in the name of Managing Director, RISL, Jaipur payable at Jaipur, (iii) Bid Security as per RTPP (iv) Letter of Technical Bid, (v) Power of Attorney and (vi) Joint Venture Agreement, if applicable. The bidder should upload scanned copies of these documents on e-procurement web-site along with their technical bids.</p>
ITB 2.2.1	<p>For Clarification purposes only, the Procuring Entity's address is : OFFICE OF THE Chief Executive Officer, Udaipur Smart city Limited. EMAIL: mc_udaipur@rediffmail.com Contact Person: Arun Vyas(SE): (M) 91-9414134012 and Manish Arora(E): 91-8003377650</p>
ITB 2.2.2	<p>A Pre-Bid conference will take place at the MEETING HALL of, Chief Executive Officer, Udaipur Smart city Limited on (Date) 27.12.2016 at (Time) 3:00PM.</p> <p>Bidder is advised to visit the site at his own expenses and if any support is required, shall be provided by the SE/EE</p>
ITB 2.2.3	The Bidder is requested, to submit questions in writing, to reach the Procuring Entity preferably not later than one week before the Pre- Bid Conference. However,

	Department may also consider questions / queries raised in writing only, during the pre-bid conference.
ITB 2.3.1	Any addendum issued shall be part of the Bidding Document and shall be uploaded on the State Public Procurement Portal and http://eproc.rajasthan.gov.in
ITB 2.3.2	To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Procuring Entity may, at its discretion, extend the deadline for the submission of the Bids, pursuant to ITB Sub-Clause 4.2 [Deadline for Submission of Bids], under due intimation to the Bidders by uploading it on the State Public Procurement Portal and its e-procurement portal

C. Preparation of Bids

ITB 3.2.1	The language of the bid shall be: English
ITB 3.3.1	The on-line Bid shall comprise of two parts submitted simultaneously, one containing the Technical Bid/ Proposal and the other the Financial or Price Bid/ Proposal.
ITB 3.3.2	The Bidder shall submit the forms, declarations and documents, as specified in section IV of Bid Document, with the Technical Bid:
ITB 3.3.3	The Bidder shall upload the following documents with its Financial Bid: <ul style="list-style-type: none"> a) Financial Proposal Submission Sheet b) Preamble to BoQ c) And other details as mentioned in Sec 4 of Vol-01
ITB 3.5.1	Add following: <ul style="list-style-type: none"> a) The type of Contract is on Lump Sum basis for STP's. Contract Price should be sum of capital cost + O&M cost + Provisional sum (PS) b) After completion of all physical works and issue of completion certificate shall be the operating period of 15 years on HAM. 50% of the treated water may be used by the bidder and remaining 50 % will be under the procuring authority.
ITB 3.5.2	The Prices quoted by the Bidder shall be fixed for lumpsum items and adjustable for remaining items. Provision of Price escalation shall be as per Conditions of Contract.
ITB 3.5.3	All variations in taxes and duties shall be borne by the contractor.
ITB 3.9.1	The Bid validity period shall be 180 (One hundred and eight days) days from deadline for submission of bids.
ITB 3.10.2	Add following: Bid security shall be 2.0 % & For bidders registered with the Procuring Entity, the bid security shall be 0.5% of value of work indicated in NIB for all bidders.
ITB 3.10.3	A Bid Security of Rs. 160.00 Lacs (Rupees One Crore sixty lacs only) (2% of the value of the works indicated in the NIB) shall be provided as a part of the bid in the form of a banker's Cheque or demand draft or bank guarantee of a Scheduled Bank in India, in specified format which shall remain valid for a period of 30 (thirty) days beyond the validity of the bid.
ITB 3.11.1	Only Digital signed copy shall be submitted through e-procurement website.

ITB 3.11.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: Power of Attorney
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D. Submission and Opening of Bids

ITB 4.1.1	<p>For bid submission purposes only, the Procuring Entity's address is : OFFICE OF THE Chief Executive Officer, Udaipur Smart city Limited EMAIL: mc_udaipur@rediffmail.com</p> <p>Bidders shall submit their Bids electronically only.</p> <p>The Bidders shall submit the Bid online with all pages numbered serially and by giving an index of submissions. Each page of the submission shall be initialled by the Authorised Representative of the Bidder as per the terms of the tender. The Bidder shall be responsible for documents accuracy and correctness as per the version uploaded by the Procuring Entity and shall ensure that there are no changes caused in the content of the downloaded document. The bidder shall follow the following instructions for online submission:</p> <ul style="list-style-type: none"> • Bidder who wants to participate in bidding will have to procure digital certificate as per IT Act to sign their electronic bids. Offers which are not digitally signed will not be accepted. Bidder shall submit their offer in electronic format on above mentioned website after digitally signing the same. • Cost of bid document is Rs.20000/- per tender should be deposited by Non Refundable Demand Draft drawn in favor of Chief Executive Officer, Udaipur Smart City Limited, Udaipur payable at Udaipur, whereas the Processing fee Rs. 1000/- should be deposited by Non Refundable Demand Draft drawn in favour of MD, RISL, Jaipur payable at Jaipur. Original documents along with above mentioned fees and other documents as per bid conditions, has to be deposited up to 3.00 PM on 16.01.2017 before opening of technical bid. • The Procuring Entity will not be responsible for any mistake occurred at the time of uploading of bid or thereafter. • If holiday is declared on submission & opening date of tender the scheduled activity will take place on next working day.
ITB 4.1.2, 4.1.3, 4.1.4	Bids are required to be submitted in Electronic Format, it shall be submitted on the e-procurement portal : http://eproc.rajasthan.gov.in
ITB 4.2.1	<p>The Deadline for electronic Bid submission is Date: 16.01.2017 Time: 6:00 PM.</p>
ITB 4.5.1	<p>The on-line Bid opening shall take place at: The office of Chief Executive Officer, Udaipur Smart city Limited. EMAIL: mc_udaipur@rediffmail.com</p> <p>The tendering process shall be conducted on-line only; DD/BC tender fee, processing fee and Bid Security shall be submitted physically up to deadline described in tender document.</p>
4.5.5	
ITB 4.5.14, 4.5.15	The Procuring Entity will open the Financial proposal as per e-tendering procedure.

E. Award of Contract

ITB 6.3.1	The period within which the Performance Security is to be submitted by the successful Bidder and the Contract Agreement is to be signed by him from the date of issue of Letter of Acceptance is 30 Days.
ITB 6.3.3	<p>The procuring entity shall promptly return the bid security after the earliest of the following events, namely:</p> <ol style="list-style-type: none"> 1. The expiry of validity of bid security 2. The execution of agreement for procurement and performance security is furnished by the successful bidder; 3. The cancellation of the procurement process; or 4. The withdrawal of bid prior to the deadline for presenting bids, unless the bidding documents stipulate that no such withdrawal is permitted.
ITB 6.4.2, 6.4.3, 6.4.4 Replace with following	<p>Performance Security amounting to total 10% of contract value (but excluding O&M cost and provisional sum) shall be submitted / deducted as follows:</p> <ol style="list-style-type: none"> (i) Contractor shall submit Performance Security @ 10% in advance at the time of signing of agreement in form of BG as per latest rules under RTPP act. The BG should be issued by any nationalized / schedule bank and shall remain valid up to 60 days beyond defect liability period. Bank Guarantee submitted against the performance guarantee, shall be unconditional and en-cashable/invokable at Town for which tenders are invited or at Jaipur. (ii) If there is no reason to retain the PG, it shall be returned back to the contractor within 60 days after the satisfactory completion of the defect liability period, subject to submission of fresh PG valid for the entire HAM period (15 years), of an amount 5% of total contract value. (iii) Refer clause 4.3.1 of Special condition of contract
7.1	<p>First Appellate Authority shall be: Vice President USCL i.e. Collector Udaipur</p> <p>Second Appellate Authority shall be: Chairman USCL i.e. Principal Secretary LSG</p>

SECTION III: EVALUATION AND QUALIFICATION CRITERIA

A. Evaluation Criteria

1.1 The successful Bid will be the lowest evaluated responsive Bid, which qualifies technical evaluation.

1.2 Adequacy of Technical Proposal

Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail.

1.3 Quantifiable Nonconformities, Errors and Omissions.

The evaluated cost of quantifiable non conformities, errors and/or omissions is determined as follows:

"Pursuant to ITB Clause 5.4, the cost of all quantifiable nonmaterial nonconformities or omissions shall be evaluated. The Procuring Entity will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of bids."

[For guidance: The cost of minor omissions or missing items should be added to the Bid Price to allow for bid comparison on an equal basis. The price adjustment should be based on a reasonable estimate of the cost by the executing agency, engineer, consultant or bid evaluation committee, taking into consideration the corresponding quoted prices from other conforming bids. The price adjustment may be based on the price of the item quoted by the next lowest qualified bidder].

B. Qualification Criteria:-

1. Eligibility:

	Criteria	Compliance Requirements			
		Single Entity	Joint Venture		
	Requirement		All Partners Combined	Each Partner	One partner
i) Nationality	National / International firm	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement
ii) Conflict of Interest	No conflicts of interest in accordance with ITB Sub-clause 1.4.3	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement

iii) Debarment/ Transgression by any Procuring Entity.	Must declare	Must meet requirement	Must meet requirement	Must meet requirement	Must meet requirement
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2. Pending Litigation:

Pending Litigation	All pending litigation shall be treated as resolved against the Bidder and so shall in total not represent more than 50 percent of the Bidder's net worth.	Must meet requirement by itself	N/A	Must meet requirement by itself	N/A
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NOTE: CA certificate clearly mention with calculation that pending litigation in total not more than 50% of Bidder's net worth.

3. Experience:

The bidder should have experience of the following in last five financial years **(2011-12 to 2015-16)**; experience in current year shall also be counted up to deadline for submission of bid:

Criteria	Compliance Requirements			
	Single Entity	Joint Venture (permitted)		
Requirement		All Partners Combined	Each Partner	One partner
Should have substantially completed(as per definition given below) / completed and Commissioned single STP/ CETP/ETP work, 40% of the cumulative capacity of bid (i.e.16 MLD STP/ CETP/ETP).	Must meet requirement	Must meet requirement	NA	NA
OR				
Should have substantially completed (as per definition given below) / completed and Commissioned two similar STP/ CETP/ETP works, 30% or more of the cumulative capacity of bid (i.e.12 MLD STP/ CETP/ETP)	Must meet requirement	Must meet requirement	NA	NA
OR				
Should have substantially completed(as per definition given below) / completed and Commissioned three similar STP/ CETP/ETP works, equal to 25% or more of the cumulative capacity of bid (i.e.10 MLD STP/ CETP/ETP)	Must meet requirement	Must meet requirement	NA	NA

Note: Contractor has completed the works but could not commission the same because of hindrances beyond control of contractor. OR

Contractor has completed and commissioned the work at least of the amount required for qualification, out of large size contract

3. Clients certificate of experience must clearly indicate whether

(i) Completed and commissioned

Or

(ii) Substantially completed as per definition given above

Or

3. CONSTRUCTION EXPERIENCE IN KEY ACTIVITIES IN LAST 5 YEARS (2011-12 TO 2015-16)

Criteria	Compliance Requirements			
	Single Entity	Joint Venture (permitted)		
Requirement		All Partners Combined	Each Partner	One partner
(i) Bidder / any JV partner should have completed and commissioned at least one STP or CETP or ETP based on UASB or ASP or SBR or MBR or MBBR technology, under a single contract in last five years, capacity of STP shall be equal to or more than the 16 MLD.	Must meet requirement	Must meet requirement	not applicable	not applicable

Note: Contractor has completed the works but could not commission the same because of hindrances beyond control of contractor. OR

Contractor has completed and commissioned the work at least of the amount required for qualification, out of large size contract

Note: For 2 & 3)

- i) The Bidder shall submit copies of Work Orders, Completion and satisfactory performance Certificates in support of their experience claims.
- ii) The works which have been completed during the period mentioned above, though may have commenced earlier, shall be considered for experience purposes.
- iii) For considering experience of the bidder, out of its experience as JV, its own works in the JV shall be considered with relevant evidence/certificates.
- iv) JV shall comprise of not more than two firms/companies. The minimum equity under JV of lead firm must be 51% and that of other firm must 25%.

5. Financial:

Criteria	Compliance Requirements			
	Single Entity	Joint Venture (permitted)		
Requirement			All Partners Combined	Each Partner
5.1 Turnover				
Average Annual Turnover of any three years out of last four years (Financial Year 2011-12 to 2014-15) should be equal to or more than (1.5x cost of work/time period in years i.e. (Rs. 60.00 Cr) . Audited Balance Sheets of all the three financial years must be submitted in support. The calculation sheet for annual average construction turnover shall be certified by a Chartered Accountant.	Must meet requirement	Must meet requirement	not applicable	Lead member must meet 60 percent of the requirement
5.2 BID CAPACITY:				
<p>Bid Capacity: The bid capacity of the bidder shall not be less than the estimated cost of the bid. The formula for calculating Bid capacity is given here</p> <p>Bid Capacity=(2xAxN)-B Where A= Maximum value of Annual Turnover from in any one year during the last four years (2011-12, 2012-13,13-14,14-15) (updated to present price level) N=Prescribed completion period of the work for which bids are invited in years, B= Value at present price level (2015-16) of existing commitments and ongoing works to be completed during N period i.e., the period of completion of works for which bids are invited.</p>	Must meet requirement	Must meet requirement	Must meet 25% requirement	Lead member must meet 60 percent of the requirement

NOTE: The certificate of CA regarding Bid Capacity must be submitted otherwise bid shall not be considered. The certificate should clearly show the calculation how the Bid Capacity is calculated as per formula given in tender. The contractor should

submit an undertaking on stamp paper of Rs. 500 that he has mentioned all projects necessary for calculation of B value for the calculation of Bid Capacity.

The present price level for turnover and cost of completed work of similar nature, the previous years value shall be given weight age of 10% per year as follows:

Sr. No	Financial Year	Weight age
(i)	2016-17	1.00
(ii)	2015-16	1.00
(iii)	2014-15	1.10
(iv)	2013-14	1.21
(v)	2012-13	1.33
(vi)	2011-12	1.46

Note: Experience and Bid capacity not required as above in case of Industrial House, Industrial House has to submit proof of turnover more than 50 crore and experience of successfully commissioning and running successfully for a period of 2 years of STP/CETP/ETP above 15 MLD either for its own use or as a CSR activity or under Public Private Partnership mode.

Section IV: Bidding Forms

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4.1 TECHNICAL PROPOSAL [WITH REFERENCE TO SECTION III] CHECK LIST

In addition to the forms given in this section, a Technical Proposal must necessarily contain the following, otherwise the bid shall be considered incomplete and may lead to non-responsive.:

1. Notice Inviting Bid
2. CA's certificates
3. Bank's letter as required in Tender Document (if applicable).
4. Sales Tax Registration in State of Rajasthan (Optional),
5. VAT / Sales Tax Clearance Certificate
6. Service Tax Registration, if required as per law
7. Proof of payment of Bid Security
8. Proof of Cost of bidding document or receipt of such cost.
9. Proof of Bid processing fee as specified.
10. Bid capacity stipulations as required in Tender Document.
11. Completion Certificates of works which have been cited in support of fulfillment of eligibility criteria as specified in Tender Document.
12. Work orders of works which have been cited in support of fulfillment of eligibility criteria as specified in Tender Document.
13. Drawings / designs / technical documents (if required) in support of works to be executed
14. Any modifications or withdrawal.
15. Other documents considered necessary to strengthen the bid.
16. JV agreement against which experience for eligibility is claimed to demonstrate clearly the JV members work in that JV.
17. Registration certificate of each bidder / JV Partner in class AA or equivalent in any State / Central / PSU / in India.
18. Check Points and Self appraisal sheet

4.2 Letter of Technical Bid**Technical Bid Submission Sheet**

Date: _____

NIB No.: _____

To: _____

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda No.

(b) We offer to execute in conformity with the Bidding Document the following Works:

(c) Our Bid shall be valid for a period of 180 days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(d) If our Bid is accepted, we commit to obtain a Performance Security in the amount of _____ percent of the Contract Price or Performance Security Declaration, as the case may be, for the due performance of the Contract;

(e) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from the eligible countries;

(f) We are not participating, as Bidder, in more than one Bid in this bidding process, other than alternative offers, if permitted, in the Bidding Document;

(g) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers has not been debarred by the State Government or the Procuring Entity;

(h) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed;

(i) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive;

(j) We agree to permit Government of Rajasthan or the Procuring Entity or their representatives to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by the Procuring Entity;

(k) We have paid, or will pay the following commissions, gratuities, or fees, if any, with respect to the bidding process for execution of the Contract:

Name of Recipient	Address	Reason	Amount

(k) We declare that we have complied with and shall continue to comply with the provisions of the Code of Integrity including Conflict of Interest as specified for Bidders in the Rajasthan Transparency in Public Procurement Act, 2012, the Rajasthan Transparency in Public Procurement Rules, 2013 and this Bidding Document during this procurement process and execution of the Works as per the Contract;

(l) Other comments, if any:

Name/ address: _____

In the capacity of: _____

Signed: _____

Duly authorised to sign the Bid for and on behalf of: _____

Date: _____

Tel: _____ Fax: _____

E-mail: _____

4.3.1 Bid Security (Bank Guarantee Unconditional)***Form of Bid Security**

[insert Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: *[Chief Executive Officer, Udaipur Smart City Limited]*

Date: *[insert date]*

BID GUARANTEE No.: *[insert number]*

We have been informed that ***[insert name of the Bidder]*** (hereinafter called "the Bidder") has submitted to you its bid dated ***[insert date]*** (hereinafter called "the Bid") for the execution of ***[insert name of contract]*** under Notice Inviting Bids No. ***[Insert NIB number]*** ("the NIB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we ***[insert name of Bank]*** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ----- ***[insert amount in figures][insert amount in words]*** upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Letter of Technical Bid; or
- (b) having been notified of the acceptance of its Bid by the *Procuring Entity* during the period of bid validity,
 - (i) fails or refuses to execute the Contract Agreement,
 - (ii) fails or refuses to furnish the performance security, in accordance with the Instructions to Bidders (hereinafter "the ITB"),
- (c) has not accepted the correction of mathematical errors in accordance with the ITB, or
- (d) has breached a provision of the Code of Integrity specified in the TB;

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of the Bidder's bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

Signed: _____

[Insert signature of person whose name and capacity are shown]

NOTE: * - Scheduled Bank Only

Name: _____

[insert complete name of person signing the Bid Security]

In the capacity of: _____

[insert legal capacity of person signing the Bid Security]

Duly authorized to sign the Bid Security for and on behalf of _____

[insert name of the Bank]

Dated on day of ,

[insert date of signing]

Bank's Seal _____

[affix seal of the Bank]

[Note: In case of a Joint Venture, the Bid-Security must be in the name of all partners to the Joint Venture/Lead bidder that submits the bid.]

4.3.2 Bid Securing Declaration

Form of Bid Securing Declaration

Date: ***[insert date (as day, month and year)]***

Bid No.: ***[insert number of bidding process]***

Alternative No, if permitted: ***[insert identification No if this is a Bid for an alternative]***

To: ***[Chief Executive Officer, Udaipur Smart City Limited]***

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with you, the Procuring Entity for the period of time of ***[insert number of months or years, as required by the Procuring Entity]*** starting on ***[insert date]***, if we are in breach of our obligation(s) under the bid conditions, because we:

- (a) withdraw our Bid during the period of bid validity specified in the Letter of Bid; or
- (b) do not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter “the ITB”); or
- (c) having been notified of the acceptance of our Bid by you, the Procuring Entity, during the period of bid validity, (i) fail or refuse to sign the Contract, if required, or (ii) fail or refuse to furnish the Performance Security Declaration, in accordance with the ITB; or
- (d) breach any provisions of the Code of Integrity as specified in the ITB;

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) thirty days after the expiration of our Bid.

Signed: _____

[insert signature of person whose name and capacity are shown]

Name: _____

[insert complete name of person signing the Bid-Securing Declaration]

In the capacity of: _____

[insert legal capacity of person signing the Bid-Securing Declaration]

Duly authorized to sign the bid for and on behalf of: _____

[insert complete name of Bidder]

Dated on _____ day of _____,

[insert date of signing]

Corporate Seal _____

[affix corporate seal of the bidder]

[Note: In case of a Joint Venture, the Bid-Securing Declaration must be in the name of all partners to the Joint Venture/ Lead bidder that submits the bid.]

4.4.1 Bidder's Qualification

To establish its qualifications to perform the contract in accordance with Section III (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

4.4.1(a) Form ELI - 1: Bidder's Information Sheet

BIDDER'S INFORMATION	
Bidder's legal name	
In case of JV/Consortium, legal name of each partner	
Bidder's /all JV/Consortium partners country of constitution.	
Bidder's /all JV/Consortium partners year of constitution	
Bidder's /all JV/Consortium partners legal address in country of constitution	
Bidder's /all JV/Consortium partners authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	
<p>Attached are self attested copies of the following original documents:</p> <ol style="list-style-type: none"> 1. In case of single entity, certificate of registration/ incorporation and memorandum of association or constitution of the legal entity named above. 2. Authorization to represent the firm or JV named in above. 3. In case of JV, letter of intent to form JV or JV agreement. 4 In case of Consortium, letter of intent to form consortium or JV consortium 	

4.4.2 Form ELI – 2: JV Information Sheet

Attach the Letter of Intent to form JV or certificate of registration/ incorporation and memorandum of association or constitution of the legal entity, if JV is already in existence.

Each member of a JV / must fill in this form

JV /consortium/ SPECIALIST CONTRACTOR'S INFORMATION	
Bidder's legal name	
JV /consortium Partner's or Subcontractor's legal name	
JV /consortium Partner's financial share in the JV	
JV /consortium Partner's or Subcontractor's country of constitution	
JV /consortium Partner's or Subcontractor's year of constitution	
JV /consortium Partner's or Subcontractor's legal address in country of constitution	
JV /consortium Partner's or Subcontractor's authorized representative information(name, address, telephone numbers, fax numbers, e-mail address)	
<p>Attached are attested copies of the following original documents:</p> <ol style="list-style-type: none"> 1. Certificate of registration/ incorporation and memorandum of association or constitution of the legal entity named above. 2. Authorization to represent the firm named above. 	

4.4.3 Form LIT 1- Pending Litigation**Each Bidder or member of a JV / must fill in this form**

Pending Litigation			
<ul style="list-style-type: none"> ○ No pending litigation in accordance with Section III (Evaluation and Qualification Criteria). ○ Pending litigation in accordance with Section III (Evaluation and Qualification Criteria) 			
Year	Matter in Dispute	Value of Pending Claim in INR	Value of Pending Claim as a Percentage of Net Worth

4.4.4 Form EXP – 1: General Construction Experience

Each Bidder or member of a JV must fill in this form

GENERAL CONSTRUCTION EXPERIENCE				
Starting Month Year	Ending Month Year	Years	Contract Identification and Name Name and Address of Procuring Entity Brief Description of the Works Executed by the Bidder	Role of Bidder

Bidder Must Enclose:

1. Certificate of CA mentioning the construction turnover as per relevant clause.

4.4.5 Form EXP - 2: Construction Experience in Key Activities

Fill up one (1) form per contract

Contract with Similar Key Activities			
Contract No. of.		Contract Identification	
Award Date		Completion Date	
Total Contract Amount	-----Equivalent INR ----		
If partner in a JV or subcontractor, specify participation of total contract amount	Percent of Total	Amount	
Employer's Name Address Telephone Number Fax Number E-mail			
Description of the key activities in accordance with Criteria.			
<p>Bidder / any JV partner should have completed and commissioned at least one STP or CETP or ETP based on UASB or ASP or SBR or MBR or MBBR technology, under a single contract in last five years, capacity of STP shall be equal to or more than the 16 MLD.</p>			
Reference page No., copy of work order and completion & commissioning certificate in support of above experience:			

4.4.6 Form EXP – 2(a): Specific Construction Experience**Note:** Please fill up one sheet per contract

CONTRACT OF SIMILAR SIZE AND NATURE		
Contract No. of.	Contract Identification	
Award Date		Completion Date
Role in Contract	Contractor / Management Contractor / Subcontractor	
Total Contract Amount	INR	
If partner in a JV or subcontractor, specify participation of total contract amount	Percent of Total	Amount
Procuring Entity's Name, Address, Telephone Number, Fax Number, E-mail address		

Bidder other than Industrial house Must Enclose:

1. Work order.
2. Experience certificate as per relevant clause from an officer not below the rank of executive Engineer or Equivalent.

4.4.7 Form: Format for assured Revolving line of credit facility*(To be submitted by a Scheduled Bank on the Bank's Letter head)***Date:** *(Insert Date)*

To: Chief Executive Officer,
 Udaipur Smart City Limited,
 Udaipur

Subject: Letter of Assurance for Revolving line of credit facility for INR ----

Dear Sir,

WHEREAS _____ *[name and address of Bidder]* (**hereinafter called the "Bidder"**) intends to submit a bid for-----
 ---- *---(name of contract package) -----* under the Udaipur Smart City Limited (**hereinafter called the "Employer"**) in response to the Invitation for Bids issued by the Udaipur Smart City Limited through NIB no. -----; and

WHEREAS the Bidder has requested that an assured revolving line of credit be provided to it for executing the ----- *---(name of contract package) -----*
 -----In the event that the Contract is awarded to it; then

KNOW ALL THESE PEOPLE by these presents that We _____ *[name of Bank]* of _____ *[name of Country]* having our registered office at _____ *[address of registered office]* are willing to provide to _____ (the Bidder) a sum of up to _____ *[amount of guarantee in figures and words]* as an assured revolving line of credit for executing the Works under ----- *---(name of contract package) -----* should the Bidder be awarded the contract based on its tendered prices.

We understand that this assurance may be taken into consideration by the Employer during evaluation of the Bidder's financial capabilities, and further assure that we intend to maintain this revolving line of credit until such time as the Works are completed and taken over by the Employer.

SEALED with the Common Seal of the said Bank on the ____ day of _____, 2015 / 2016.

Date: _____ Signature of the Bank: _____

Witness: _____ Seal: _____

[Signature, name and address]

4.5 Declaration by the Bidder in compliance of Section 7 & 11 of the Act**Declaration by the Bidder/ JV**

In relation to our Bid submitted to *[enter designation and address of the procuring entity]* for procurement of *[insert name of the Works]* in response to their Notice Inviting Bids No..... Dated we hereby declare under Section 7 and 11 of the Rajasthan Transparency in Public Procurement Act, 2012, that;

1. We possess the necessary professional, technical, financial and managerial resources and competence required by the Bidding Document issued by the Procuring Entity;
2. We have fulfilled our obligation to pay such of the taxes payable to the Central Government or the State Government or any local authority, as specified in the Bidding Document;
3. We are not insolvent, in receivership, bankrupt or being wound up, not have my/our affairs administered by a court or a judicial officer, not have my/our business activities suspended and are not the subject of legal proceedings for any of the foregoing reasons;
4. We do not have, and our directors and officers not have, been convicted of any criminal offence related to our professional conduct or the making of false statements or misrepresentations as to our qualifications to enter into a procurement contract within a period of three years preceding the commencement of this procurement process, or not have been otherwise disqualified pursuant to debarment proceedings;
5. We do not have a conflict of interest as specified in the Rajasthan Transparency in Public Procurement Act, the Rajasthan Transparency in Public Procurement Rules and this Bidding Document, which materially affects fair competition;
6. We have complied and shall continue to comply with the Code of Integrity as specified in the Rajasthan Transparency in Public Procurement Act, the Rajasthan Transparency in Public Procurement Rules and this Bidding Document, till completion of all our obligations under the Contract.

Date:	Signature of Bidder
Place:	Name:
	Designation:
	Address:

4.6 Letter of Financial Bid**Financial Bid Submission Sheet**

Date: _____

NIB No.: _____

To: _____

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda No.:-

(b) We offer to execute in conformity with the Bidding Document the following Works:

(c) The total Price for our Bid, excluding any discounts offered, if permitted, in item (d) below is: _____

(d) The discounts offered, if permitted, and the methodology for their application are: _____

(e) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.

(f) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(g) Other comments, if any:

Name/ address: _____

In the capacity of: _____

Signed: _____

Duly authorised to sign the Bid for and on behalf of: _____

Date: _____

Tel: _____ Fax: _____

E-mail: _____

4.7. POWER OF ATTORNEY

Power of Attorney for Authorized Representative

The firm M/s.....authorize the following Representative to sign and submit the tender document, negotiate terms and conditions for the contract, to sign the contract, to deal with the _____, to issue and receive correspondence related to all matters of the tender "-----". We / M/s _____ undertake the responsibility due to any act of the representative appointed hear by.

For Partnership Firm's

S. No.	Name of the All Partner	Signature of Partner with Seal
1.		
2.		
3		
4	Name and Designation of the person Authorized	
5	Attested Signature of the Authorized Representative	

For Limited Firm's

Name and Designation of the person Authorized	
Firm	
Address	
Telephone No.	
Fax No.	
Telex No.	
Authority By which the Powers is delegated	
Attested Signature of the Authorized Representative	
Name and Designation of person attesting the signatures	

4.9: Joint Venture Agreement (Between not more than two firms)**(ON Rs 1000 STAMP PAPER)****Memorandum of Understanding for****JOINT VENTURE**

This Memorandum of Understanding (hereinafter referred to as "MOU") is made and entered into this ----- ("Effective Date").

BETWEEN

M/s. _____, a company incorporated, and having its registered office at _____.
(Hereinafter referred to as the "**First Party**"/ "**One Partner**");

M/s. _____) a company incorporated, and having Registered office at _____.
(Hereinafter referred to as the "**Second Party**"/ "**Each Partner**");

Hereinafter jointly referred to as the "**Parties**" and individually as "**Each Party**" or "**a Party**" as the case may be.

WHEREAS,

A) The Udaipur Smart City Limited, Udaipur, Rajasthan (hereinafter referred to as the USCL or procuring entity) invited bid for

_____,

(B) The Parties hereto formed a Joint Venture or will form a joint venture (hereinafter referred to as the "**JV**") to jointly execute the above project in all respect

NOW THEREFORE IT IS HEREBY AGREED as follows

ARTICLE 1: JOINT VENTURE:

1.1. The Parties hereto agree to form the Joint Venture with _____ designated as the **One Partner and First Partner**.

1.2. _____ **shall be the Second Member – or Second Partner**

1.3. _____ **shall be the Third Member – or Third Partner** (*insert more lines if more partners*)

ARTICLE 2: JOINT VENTURE NAME:

2. The JV shall do business in the name of “_____ **Joint Venture**”.

ARTICLE 3: JOINT AND SEVERAL LIABILITY:

3. The **Parties** hereto shall, for the above-referred **Projects**, be jointly and severally liable to the **Employer** for the execution of the Projects in accordance with the **Contract** till the actual completion of Contract including defect liability period and operation & maintenance as per bid conditions.

ARTICLE 4: PROPORTIONATE SHARE:

4.1 Each member of the Joint Venture agrees to place at the disposal of the Joint Venture, the benefit of all its experience, technical knowledge and skill, and shall in all respects bear its share of responsibility and burden of completing the contract. The parties herein shall be responsible for physical and financial distribution of work as under.

Lead Partner: Financial responsibility: -----

Physical responsibility: -----

Other Partners: Financial responsibility: -----

Physical responsibility: -----

4.2 All rights, interests, liabilities, obligations, risks, costs, expenses and pecuniary obligations and all net profits or net losses arising out of the **Contract** shall be shared or borne by the **Parties** in the above **Proportions**.

4.3 The members in the proportion as mention in article 4.1, shall contribute sufficient Initial fixed capital for timely execution of the project including commissioning & operating period as per the contract.

ARTICLE 5: JOINT EFFORT AND MANAGEMENT:

5.1 The **Parties** shall participate as a **JV** in the submission of bids and further negotiations with the **Employer** and shall co-operate and contribute their respective expertise and resources to secure and execute the **Projects**.

5.2 On award of **Projects**, the **First Partner** in consultation with the other members of JV will decide on the final management structure for the successful execution of the **Projects** as per the terms of **Contract**.

5.3 All the **Parties** hereby agree to pool in their financial, administrative, managerial, technical and material resources for execution of the **Projects**, including commissioning & operation for the period as stipulated in the contract. The share of interest of the **JV** shall be as per the mutual understanding for the successful completion of the project.

ARTICLE 6: EXCLUSIVITY:

6.1 The co-operation between the **Parties** hereto shall be mutually exclusive i.e. none of them shall without the other **Party's** consent & prior approval of **RUDSICO**, approach or cooperate with any other parties in respect of the Project.

6.2 In the course of working as associates, the parties to the JV will be sharing information with each other which may be proprietary /confidential information /knowledge acquired by each other. It is hereby agreed that the parties will maintain complete secrecy regarding such information / knowledge and will not divulge to any party for any other purpose except for the success of the joint execution of the contract. All parties will also indemnify each other against any claim that may arise out of using information, which are being claimed proprietary.

ARTICLE 7: Memorandum of Understanding:

7.1 This **Memorandum of Understanding** shall be terminated:-

- a. if the **Parties** mutually confirm that the **JV's** bid proposal has not been finally accepted by **Employer** and all rights and obligations of the **Parties** under or in connection with this **Memorandum of Understanding** have ceased, or
- b. after successful completion of the project including commissioning & operation and defect liability period from the date of this **Memorandum of Understanding** unless extended for a further period on demand of **USCL** & mutual consent of the Parties, or

7.2 The **Memorandum of Understanding** can be modified by mutual consent of the Parties to suit the efficient and expeditious execution of Projects including commissioning & operation of Plant or to make this agreement more meaningful to suit the requirements of Employer **after the consent of the Employer**.

ARTICLE 8: ARBITRATION:

8.1 Any dispute resulting from this Agreement shall be settled amicably by mutual Consultation by the Managing Directors/Chairman of _____ & _____. In the event that an amicable settlement is not reached within 60 days in any particular case, the dispute shall be referred to arbitration and shall be resolved in accordance with and subject to the provisions of the _____ and any statutory modifications and enactment hereof for the time being in force. The decision of the arbitrators shall be final and binding upon both parties. The venue of arbitration will be _____.

ARTICLE 9: GOVERNING LAWS:

9.1 This Agreement shall in all respects be governed by and interpreted in accordance with the _____ Laws.

ARTICLE 10: CONFIDENTIALITY:

10.1 No Party hereto shall disclose to any other party any information of a confidential nature including but not limited to trade secrets, know-how acquired from any Party in connection with the subject matter of this Agreement.

ARTICLE 11: ADDRESS OF CONSORTIUM:

Any and all correspondence from the Employer to the **JV** shall be addressed to **(name of JV)** at the address stated herein below—(any one of the partners). The address of the Consortium office of the partner companies will be deemed to be the address for the purpose of communication.

The notice, if any required to be served on the party by the other party, will be deemed to be served, if the said notice / communication is delivered by Registered Post at the respective address **(name of JV)**

ARTICLE 12: Authorized Representative:

The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution.

Authorized Representative of JV: _____

ARTICLE 13: ASSIGN ABILITY:

13.1 The interests and rights of a Party in the Contract and as a Party of the Joint Venture shall not be transferable or assignable without the written consent of the Employer & other party.

ARTICLE 14: INTERPRETATION OF HEADINGS:

14. The headings of each of the Articles herein contained are inserted merely for convenience of reference and shall be ignored in the interpretation and construction of any of the provisions herein contained.

ARTICLE 15: OTHERS

15.1 Any other matters not contained in this Agreement shall be discussed and amicably agreed upon by the Parties in the spirit of mutual trust and cooperation for timely completion of project including commissioning & operation of project. Notwithstanding anything above all the Parties are severally and jointly responsible to the Employer for execution of the Contract:

IN WITNESS WHEREOF the Parties hereto have caused this Agreement to be executed by each of the duly authorized representatives as appearing below:-

Signed by _____)

For and on behalf of

_____)

in the presence of: _____)

Name:

Designation:

Signed by _____)

For and on behalf of _____)

_____.

in the presence of: _____)

_____)

Name:

Designation:

Name:

Designation:

Name :

Designation:

4.10 Bidding Capacity = 2 A X N - B

4.10.1 STATEMENT FOR WORK IN HAND (for calculation of value of B)

This is to certify that the status of the present works in hand as on **date of publication of NIT** of order value more than Rs. 10.00 lacs for which either order are received or the work is under execution but which are still not completed is as under:

Amount In Lac Rs.

S. No	Brief Description of Work	Stipulated Date of Start	Stipulated Date of Completion	Time left for execution after date of publication of NIT , in months	Cost of awarded work	Cost of work executed up to date of publication of NIT	Balance Cost of un-executed work as on date of publication of NIT in 30 month from and date of submission
1	2	3	4	5	6	7	8=6-7

1. If the value of Balance work goes beyond 30 months from the date of bid submission then client certificate mentioning the amount of work to be executed beyond 30 months, otherwise full balance work shall be accounted for calculation of 'B' value.

2. This is certified that this is true in all respect and can be used for calculation of the bidding capacity as per the formula given in ITB. This is also certified that other orders under execution by the firm shall not materially affect the bidding capacity of the firm as required in this tender. **(Format should be on Rs 500/= stamp paper)**

Signatures With Seal of Authorized Signatory for tender

4.11 Check Points must be filled by Bidder

S. No.	Page No. of RFP	Requirements / Documents required to be submitted		Check Points	Yes / No	Enclosed at page no. of bid and any other detail as required
		GENERAL				
1	33	Cost of Bid Document as Rs. 20,000/-	DD/Cheque in favour of Chief Executive Officer, Udaipur Smart City Limited Original hard copy to be submitted in the office of Chief Executive Officer, Udaipur Smart City Limited by date and time mentioned in NIB and scanned copy to be uploaded with technical bid	Confirm it is of scheduled bank? Name of Bank Amount Rs. 20000.00 In favour of Chief Executive Officer, Udaipur Smart City Limited		
2	33	Bid Processing Fee of Rs 1,000/-	DD/Cheque in favour of MD, RISL Original hard copy to be submitted in the office of Chief Executive Officer, Udaipur Smart City Limited by date and time mentioned in NIB and scanned copy to be uploaded with technical bid	Confirm it is of scheduled bank? Name of Bank Amount Rs. 1000.00 In favour of MD, RISL		
3	11, 33	Bid Security of Rs. _____ lacs (Rupees ____ crore _____ lakh _____ thousand Only) In case of JV , the Bid Security must be in the name of all partners to the	DD / Bankers Cheque / Bank Guarantee as per format on page 49 Original hard copy to be submitted	Confirm that as per format? Confirm that it is in prescribed format? If not, liable to be rejected.		

S. No.	Page No. of RFP	Requirements / Documents required to be submitted		Check Points	Yes / No	Enclosed at page no. of bid and any other detail as required
		Joint Venture / Lead bidder that submits the bid. Should be valid up to _____	in the office of Chief Executive Officer, Udaipur Smart City Limited by date and time mentioned in NIB and scanned copy to be uploaded with technical bid	Confirm that it is unconditional? If any condition bid liable to be rejected.		
				State in whose name is bid security (JV or Lead Bidder)		
				BG number		
				Confirm that BG is Valid up to 30 days beyond the validity of bid		
				Confirm it of a scheduled bank? Mention the Name of bank.		
				Amount		
4	33	Power of Attorney	On Stamp Paper, as per page 67 Original hard copy to be submitted in the office of Chief Executive Officer, Udaipur Smart City Limited by date and time mentioned in NIB and scanned copy to be uploaded with technical bid	Confirm that value of Stamp Paper is Rs. 500/-		
				Name & designation of person who has issued POA		
				Name & designation of person to whom POA is issued		
5	33	Joint Venture Agreement	Agreement as per format on page 77 (not more than two companies)	Confirm that value of Stamp Paper is Rs.		

S. No.	Page No. of RFP	Requirements / Documents required to be submitted		Check Points	Yes / No	Enclosed at page no. of bid and any other detail as required
			Original hard copy to be submitted in the office of Chief Executive Officer, Udaipur Smart City Limited by date and time mentioned in NIB and scanned copy to be uploaded with technical bid	1000/-		
				Confirm that financial responsibility of lead partner is minimum 51%		
				Confirm that financial responsibility of other partner bidder is minimum 25%		
				Confirm that JV is in prescribed format. If not, liable to be rejected.		

4.12 SELF APPRAISAL SHEET TO BE FILLED BY THE BIDDER FOR DETERMINATION OF RESPONSIVENESS

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
General Requirements					
1		VAT Registration /clearance certificate	Confirm that submitted	Yes / No	
2		VAT Registration in Rajasthan	Confirm that submitted with this bid or will be submitted later as per clause _____	Yes / later after award	
Eligibility Criteria					
3	40	Nationality - Indian/International firms	Specify nationality	Indian/International	
4	40, 65	Declaration as per format on page 65 Requirement to be fulfilled by: Each of the consortium / JV member	Confirm that declaration submitted by bidder / each partner in case of JV	Yes / No	
			Confirm that it is in the prescribed format. If not, bid is liable to be rejected	Yes / No	
5	40	declaration regarding Debarment/Transgression by any procuring entity Requirement to be fulfilled by: Each of the consortium / JV member	Confirm that declaration submitted by bidder / each partner in case of JV	Yes / No	
			Confirm that it is in the prescribed format; If not, bid is liable to be rejected	Yes / No	
6	40, 55	Pending Litigation in Form LIT-1 - All pending litigation shall be treated as resolved against the bidder and so shall in total not represent more than 50 percent of Bidder's net worth Requirement to be fulfilled by: Each of the consortium / JV member	Confirm that declaration submitted by bidder / each partner in case of JV	Yes / No	
			Confirm that it is in the prescribed format; If not, bid is liable to be rejected	Yes / No	

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
			Confirm that value of litigations is less than 50% of bidder's net worth and CA certificate showing calculation	Yes / No	
7		<p>The bidder should have experience of the following in last five financial years (2010-11 to 2014-15); experience in current year shall also be counted up to 28 days prior to the deadline for submission of bid:</p> <p>The bidder should have substantially completed / completed and Commissioned one single similar work (which includes 16 MLD STP)</p> <p>OR</p> <p>The bidder should have substantially completed / completed and Commissioned two similar works (which includes 12 MLD STP only)</p> <p>OR</p> <p>The bidder should have substantially completed / completed and Commissioned three similar works (which includes 10 MLD STP only)</p> <p><u>Substantially completed means:</u></p> <p>i. Contractor has completed the works but could not commission the same because of hindrances beyond control of contractor.</p> <p>OR</p> <p>ii Contractor has completed and commissioned the work at least of the amount required for qualification, out of large size contract.</p>	<p>Number of works on basis of which eligibility is claimed.</p> <p>Details of qualifying works : Work no. 1</p> <p>Name of work (in brief)</p> <p>Name of client</p> <p>Value of work done value of work done by bidder in case work is carried out in JV</p> <p>Stipulated Date of start (as per work order)</p> <p>Stipulated Date of completion (as per work order)</p> <p>If completed & commissioned, indicate Actual date of completion & commissioning (as per client's certificate). Confirm that this date is after 31.3.10.</p>	<p>Yes / No</p>	

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
		<p>In case of JV, all partners combined should meet the requirement.</p> <p>i) Copies of Work Orders, Completion and satisfactory performance Certificates in support of their experience claims. Only works of Govt/PSU/Autonomous bodies under Govt. Sector shall be considered. The works which have been completed during the period mentioned above, though may have commenced earlier, shall be considered for experience purposes.</p> <p>For considering experience of the bidder, out of its experience as JV, its own works in the JV shall be considered with relevant evidence/certificates.</p>	<p>Confirm any one of the following:</p> <ul style="list-style-type: none"> i. Work is completed and commissioned ii. works is completed but could not be commissioned because of hindrances beyond control of contractor iii. Work is completed and commissioned at least of the amount required for qualification, out of large size contract. 		
			Confirm that client's certificate clearly mentions one of the above 3 criterion, with details, otherwise bid is liable to be rejected.		
			Confirm that copy of work order is attached.		
			Confirm that copy of client's certificate is attached and it has reference of above work order.		
			Confirm that the certificate is issued by the officer not below the rank of Executive Engineer.		

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
			Similar information to be given for each work if work done is more than one		
			Name of work (in brief)		
			Name of client		
			Value of work done		
			value of work done by bidder in case he carried out this work as JV		
			Stipulated Date of start (as per work order)		
			Stipulated Date of completion (as per work order)		
			Total length of sewer line		
			Length of line of diameter more than 450 mm		
			If completed & commissioned, indicate Actual date of completion & commissioning (as per client's certificate). Confirm that this date is after 31.3.10.		

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
			Confirm one of the following: i. Work is completed and commissioned ii. works is completed but could not be commissioned because of hindrances beyond control of contractor iii. Work is completed and commissioned at least of the amount required for qualification, out of large size contract.		
			Confirm that client's certificate clearly mentions one of the above 3 criterion, with details.		
			Confirm that copy of work order is attached.		
			Confirm that copy of client's certificate is attached and it has reference of above work order.		
			Confirm that the certificate is issued by the officer not below the rank of Executive Engineer.		
8		Bidder / any JV partner should have completed and	Details of qualifying works :		

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
		<p>commissioned / completed / substantially completed at least one STP or CETP or ETP based on UASB or ASP or SBR or MBR or MBBR technology, under a single contract in last five years, capacity of STP shall be equal to or more than the 16 MLD capacity of STP.</p> <p><u>Substantially completed means:</u> i. Contractor has completed the physical works of STP but could not commission the STP because of hindrances beyond control of contractor.</p>	<p>Work no. 1</p> <p>Technology of STP/CETP/ETP</p> <p>Confirm that capacity more than 16 MLD</p> <p>Name of work (in brief)</p> <p>Name of client</p> <p>Value of work done</p> <p>value of work done by bidder in case work is carried out in JV</p> <p>Stipulated Date of start (as per work order)</p> <p>Stipulated Date of completion (as per work order)</p> <p>If completed & commissioned, indicate Actual date of completion & commissioning (as per client's certificate). Confirm that this date is after 31.3.10.</p> <p>Confirm one of the following:</p> <p>i. Work is completed and commissioned</p> <p>ii. works is completed but could not be commissioned because of hindrances beyond</p>		

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
9			iii. control of contractor Work is completed and commissioned at least of the amount required for qualification, out of large size contract.		
			Confirm that client's certificate clearly mentions one of the above 3 criterion, with details otherwise bid is liable to be rejected.		
			Confirm that copy of work order is attached.		
			Confirm that copy of client's certificate is attached and it has reference of above work order.		
			Confirm that the certificate is issued by the officer not below the rank of Executive Engineer.		
		Form FIN-2 - Average Annual Turnover of any three financial years out of last four Financial years (Financial Year 2011-12 to 2014-15) should be equal to or more than (1.5x cost of work/time period in years) i.e. 60.00 crore. The calculation sheet for annual average turnover shall be certified by a Chartered Accountant. In case of JV, lead member should meet 60 percent (Rs. 36.00 crore) of the requirement	Confirm that Certificate of Chartered value for each financial year and calculation of average value at present price level, attached; If not, bid is liable to be rejected		

S. No.	Page No. of RFP	Requirements as per bid document	Check points	Tick the correct option or fill in information	Enclosed at page no. of bid and any other detail as required
			Indicate value of avg annual turnover		
10		Bid capacity	Confirm that affidavit of bid capacity submitted on Stamp Paper of Rs. 500.00		
			Confirm that certificate of CA submitted for Bid Capacity clearly showing calculation; If not, bid is liable to be rejected		
			Value of A		
			Value of B		
			Bid Capacity		
			Confirm that bidder has mentioned in affidavit that all works above Rs. 10 lakhs, to be completed in next 30 months (period of completion + bid validity period), required for determination of value of "B" are declared		
			Confirm that bank's letter submitted for revolving line of credit, If required		
			Confirm that the above bank's letter is as per format;		

Note: Construction experience and Bid capacity not required in case of Industrial House, they have to submit proof of turnover more than 50 crore and experience of successfully commissioning and running successfully for a period of 2 years of STP above 15 MLD either for its own use or as a CSR activity or under Public Private Partnership mode.

SECTION V

REQUIREMENT OF WORKS

SCOPE OF WORK & GENERAL SPECIFICATIONS

SUB SECTION 1(STP & Associated works)

1.1 General Requirements

The STP shall be based on Sequential Batch Reactor (SBR) Technology.

All the designs and drawings of the STP,s under this package are required to be approved from any of the Indian Institute of Technology/ National Institute of Technology (IIT/NIT) at Bidder's cost and in conformation with CPHEEO specifications and Indian Standards, before submitting them to respective Nagar Nigam/UIT, The design should be able to deliver outcome (a) quality of effluent as per UIT's b) requirement of CPCB /RPCB norms (c) Guaranteed power consumption (d) other guaranteed parameters (e) safety and durability of structures and equipments (f) Safety of personnel (g) based on SBR technology with successful operation (h) environment and health parameters as per international standards (i) process optimization (j) reduction in power consumption. Work shall be carried out as per these approved design and drawings from IIT/NIT.

In case design is not acceptable to respective ULB, for any reason, Bidder is required to resubmit design duly approved from the same IIT/NIT incorporating requirements of respective ULB, for its approval at its own cost.

Bidder may choose any of the IIT/NIT at his convenience, but shall be fully responsible for getting timely submission of designs/ revised designs incorporating respective ULB's requirements

Bidder is required to submit the complete proposed process well in advance for execution/Installation/erection/commissioning of each unit/activity for approval of Engineer In charge and should proceed with the approved methodology only. In case methodology is not approved by Engineer In charge, Bidder is required to submit revised methodology till it gets the approval of Engineer In charge. The time for submission of methodology for each activity should be such that there should be no delay on this account. In case of any delay due to non-approval of methodology/delay in approval, it shall be wholly on the part of Bidder.

The proposed treatment plant is based on SBR Technology meeting the tender document conditions

For Instrumentation and Electrical works, in general bidder shall follow specification given in subsection. However, design criteria shall be as per bidder's design. Bidder shall furnish detailed specification of other equipment not listed in the main bid. The bidder shall ensure compliance of all Governmental regulatory requirements along with those pertaining to the plant construction, operation & maintenance requirements. The bidder shall arrange submission and clearance of appropriate drawings, details, etc, and obtain all necessary statutory clearances as deemed necessary.

In order to ensure the reliability of individual and process units of the STP, all process units shall be designed and built as a minimum of two units for the stated flow through the Sewage Treatment Plant. As a general principle, the bidder shall resort to minimum pumping through the plant.

However, it is strongly recommended that the bidders carry out their own hydraulic and process calculations and submit the drawings accordingly.

Minimum free board in general shall be 300mm at peak flow for all units. The freeboard in the unit/basin shall be 500 mm (minimum) at peak flow. All units and

channels the top of the unit/ channel shall be minimum 750mm or 450mm + 500mm handrail above GL.

The piping, chambers, channels, and launders shall all be designed to ensure non-silting velocity during the low flows.

1.2 Location and capacity & details of proposed STP's

STP	Capacity of STP in MLD	Land available in Hect
STP-1 (Near Kajrali House)	5.0	0.79
STP-2(Near FCI Godown)	10.0	0.715
STP3(At Eklingpur)	25.0	2.50

Notes:

1. Bidder shall prepare detail design of respective STPs strictly as per available land shown in above tables for STP and get it approved from NIT/IIT and intimate the Procuring Entity.
2. The layout of STP must be fit in the available land shown above and bidder is advised to visit the STP site prior to quoting the rates.
3. The Bidder is advised to visit the site of STP and accordingly frame construction methodology i.e work of Sump with pumping station of STP shall be taken up first where the STP site is near to ponding pumping of waste water exist.

1.3 Process Requirements

The treatment process proposed for the town shall be based on SBR technology and approved by EIC. The unit operations/ processes for treatment shall be as below:

- i. Screening (Coarse)
- ii. Raw Sewage Pumping Station
- iii. Stilling Chamber
- iv. Screening (fine)
- v. Grit removal
- vi. Flow Measurement
- vii. Treatment Process unit
- viii. Chlorination cum Treated water UG Tank
- ix. Centrifuge
- x. Sludge Sump (if Req)
- xi. DWPE Dosing
- xii. Over head treated water tank with Pumping of treated water to over head treated water tank
- xiii. PLC SCADA

1.4 Raw Sewage Quality

The sewage treatment plant shall be designed for key raw sewage quality parameters as under:

Design parameter	Value for design purpose(STP)
BOD 5 @ 20o C	300 mg/l
COD	650 mg/l
TSS	650 mg/l
TKN (as N)	55 mg/l
TP	6 mg/l
PH	6-9
Flow	As per capacity mentioned above Average Flow

1.5 Treated sewage quality

The STP shall be designed to achieve following treated sewage quality standards unless specifically permitted otherwise by the Procuring Entity.

Characteristics of the treated sewage shall be as follows:

(a) For STP -

BOD	<	10 mg/l
COD	<	50 mg/l
TSS	<	10 mg/l
NH4-N	<	5 mg/l
N Total	<	10 mg/l
Total Phosphorus	<	2 mg/l
Fecal coliform	<	100 MPN/100 ml
PH	<	6.5-9

The bidder may also carry out his own appraisal of the raw sewage quality. However, for design purposes, the Raw Sewage parameters as detailed above shall be followed.

1.6 Process Guarantees

In addition to the treated sewage quality, the following process guarantees shall also be met by the Bidder

- After grit removal: grit in the sewage shall not have size greater than 100 micron With specific gravity of 2.65 or higher
- Organic content in evacuated grit: not be over 3 % on dry basis.
- Dissolved oxygen in mixed liquor on in the SBR Basin measured at the time of decanting in each basin: not less than 0.5 mg/l
- Solid content in the wet cake: not less than 22%.

- Process power consumption Guarantee.

In case the raw sewage quality parameters exceed those defined in the Clause above on a regular basis, during the PG tests and/or O&M period, all efforts shall be made by the Bidder as directed by the Procuring Entity's Representative to run the plant at rated hydraulic capacity and assess the in-built cushion in the design for achieving the effluent parameters relating to SS, BOD, COD, Total nitrogen, Total Phosphorus and pH without making any modifications in Plant or machinery, but by varying other process parameters.

2 Completeness of the Offer:

The Bidder shall be fully responsible to include in his bid the whole of the Works, including each individual component, designed and constructed in accordance with good engineering practice and best Industrial standards. The offered plant should function as a whole, a fully integrated system which is capable of achieving the required effluent parameters in an efficient and economical manner, and eliminate all public complaints originating from the odors and pest nuisance assignable to improper design and/or poor Operation & Maintenance. The offer shall include all buildings, plant, equipment and accessories required for the efficient, safe and satisfactory operation of the facilities. Any accessories which are not specifically mentioned in the specifications/requirement, but which are usual or necessary for completion of the Works and successful performance of the plant and facilities, shall be provided by the Bidder within the tendered cost. The Bidder shall, to the maximum extent practical and feasible, endeavor to offer standardized designs and Plant and equipment keeping in view minimization of operation and maintenance requirements. The Bidder shall ensure that his offered designs and equipment are "maintenance-friendly".

3 Automation and Control:

- PLC based automation system with application software based on Rockwell hardware or equivalent to control all pumps, valves, blowers, VFD, decanters, limit switches and probes, as per bidder's design including I/Os with 20% spares, power supplies and UPS.
- HMI Panel to comprise up-to-date standard PC with monitor, printer, mouse, internet connection, RS-view, RS-links (gateway version), entire process and operator software with dynamic flow charts, pictures, screens, alarms, historical trends, reports, etc.
- SCADA based Automation System to monitor continuously in each tank the following:
 - (i) Filling volume
 - (ii) Filling quantity
 - (iii) Discharge quantity
 - (iv) DO-level
 - (v) Temperature
 - (vi) Energy requirements
 - (vii) Blower speeds
 - (viii) Decanter speed
 - (ix) Equipment operation hours
- On line monitoring of treated water quality parameters

• BOD	<	10 mg/l
• COD	<	50 mg/l
• TSS	<	10 mg/l
• NH4-N	<	5 mg/l
• N Total	<	10 mg/l
• Total Phosphorus	<	2 mg/l
• PH	<	6.5-9

SUB SECTION 2 (STP & ASSOCIATED WORKS)

PARTICULAR REQUIREMENT OF THE PACKAGE

1.0 Scope of Work

The scope of STPs includes but is not restricted to the testing of raw sewage, detailed design including hydraulic, process, equipment design, and preparation of detailed layout working drawings for process layout plan, General arrangement drawings, civil, electrical, mechanical, instrumentation and structural drawings, electrical, mechanical, instrumentation system, automation diagrams, data sheets of equipments and cable schedules and detailed structural steel fabrication drawings, preparation of design report manufacture and testing at places of manufacture, painting, packing, transport, delivery, supply, storage, erection, building-in, setting work, commissioning, testing, painting, lining and finishing after erection of all plant required for the Sewage Treatment Work, including pipelines, pumps, pumping installations, machinery apparatus, whole plant computer based atomization system, pipe work, lifting, handling and ventilation equipment, electrical equipment instrumentation, control, lighting systems, earthing and lighting protection system, materials, articles, fittings and accessories, ancillaries, electrical switchyard, ancillary works, enabling works of all kind and nature required for installations of the highest possible operative standards and for compliance with the standards prescribed in the specification and with the particulars and guarantees entered by the Bidder in the schedules Different capacities Sewage Treatment Plant and facilities (hereinafter referred to as “the Works”), followed by Fifteen year operation and maintenance of the Plant and facilities (hereinafter referred to as “Operation and Maintenance”) under Hybrid Annuity Model, following successful completion of the commissioning and issuance of the Completion Certificate for the Works. It broadly comprises the following works:

- (a) All preparatory work, including required topographical survey, clearing out trees, shrubs, debris, leveling and dressing of the site, excavation in wet saturated soil and disposal of surplus excavated earth within the site to the extent possible and proper disposal of the extra surplus excavated earth to a suitable location as decided by the Procuring Entity’s Representative and may requires pumping and special foundation and avoid STP from flooding in rainy season. ;
- (b) Carrying out of necessary site surveys and soil investigations (SPT, Plate load test etc. as directed by engineer in charge) as are deemed necessary by the Bidder for the purpose of designs/ drawings check and if the soil bearing capacity less, then Bidder have to do soil treatment work on their own cost department will not pay for that work, which will be subsequently approved by the Engineer-in-charge.
- (c) The worst-case criteria for bearing pressures and other design criteria shall be used from the site surveys and soil investigations
- (d) Process and hydraulic design calculations, analytical sewage characterization, detailed engineering, process layout, hydraulic flow diagram, construction drawings, civil works construction, supply, installation/erection, testing and commissioning of Mechanical, Electrical, Instrumentation and automation system, allied road work, etc., complete **on turnkey basis on HAM**, commissioning and operation & maintenance of treatment plant based on the **SBR** process or equivalent or higher process meeting tender document conditions for complete sewage treatment plant and facilities, including future up-gradation, making provision for second module to meet the ultimate design capacity and tertiary level treatment etc.

- (e) The detailed Architectural & Structural designs and drawings for all civil works, including those for plant components, buildings, building services, water supply, building, plant & yard lighting, storm water drainage etc. as per the requirement of the system.
- (f) All the designs, drawings and specifications are required to be approved from by the Engineer in charge.
- (g) Construction of treated water over head reservoir with 22 meter staging, RCC underground treated water cum chlorination tank of capacity mentioned in TENDER DOCUMENT with required pumping system with pump room for disposal / reuse of treated water for irrigation/gardening etc.
- (h) Construction of compound wall all around the plot boundary and fixing of compound gates as the requirement and as per the approval of Procuring Entity or Procuring Entity's Representative
- (i) Construction of Approach Road to all the STP sites including RCC Culvert on existing Nallah (if any).
- (j) Detailed design and drawings of all mechanical, electrical and instrumentation systems and all other equipment based on the approved design process, layout etc.,
- (k) Construction of all civil structures including plant components, buildings, water supply, storm water drainage of campus as per latest prevailing specification and as per QA-QC manual of RUIDP.
- (l) Designs, manufacture, shop-testing, inspection, transportation to site, installation, testing and commissioning of all piping & valves, mechanical, electrical, instrumentation & control equipment and systems as per specifications.
- (m) Construction and equipping of analytical laboratory for routine testing of raw and treated sewage quality on a day to day basis and control of process parameters;
- (n) Instituting Quality Assurance and Quality Control procedures during construction and Operation period;
- (o) Preparation and submission of "as-built drawings" and "Operation and Maintenance Manual" for the plant;
- (p) Trial runs, testing, commissioning and conducting of performance guarantee tests of complete plant;
- (q) Operation of the Sewage treatment plant with all required consumables, polyelectrolyte, tools and tackles and spares and water for a period of 15 year under HAM. The line agency for O & M shall be respective **Nagar Nigam/UIT**.
- (r) Constructing, equipping and maintaining a utility workshop dedicated for routine minor repairs such as welding, drilling, machining etc.
- (s) Training Procuring Entity's designated personnel in operation and maintenance of STP and its facilities.
- (t) Campus development including construction of campus road network from main road outside campus to all new units of plant in order to have access for operation and maintenance of plant & equipment as per the directions of Engineer-in-charge, Site development, landscaping, arboriculture and horticulture at the side of new units of the treatment plant, by providing earth filling and storm water drainage network ultimately discharging into proposed excess sewage by pass channel.
- (u) Model of plant: A model shall be provided in the form of a three dimensional Auto Cad (or equivalent) software model viewable on the computer equipment provided. The model shall be rendered to allow viewing of the model from various viewpoints to show all structures, interconnecting pipe work and

equipment with different Colour lighting. Three-dimensional physical model with seating table, covered by transparent sheet, showing treated and untreated sewage with different colours lightings and necessary internal lighting in different colours for made the self explanatory of plant model in suitable scale shall also be provided.

- (v) Site office as elaborated in Sub Clause 2.1 of this section.
- (w) The Bidder shall make the necessary arrangements to dispose the sludge generated as per the directions of respective **Nagar Nigam/UIT** to their respective land fill sites.
- (x) Providing and installation of required capacity DG set in that campus. DG set shall be operated whenever power supply fails. In case, it is not required to be operated during any week, it should be compulsorily operated in one shift at least in a week to maintain it in good health under intimation to the line agency. Regular stock of diesel and consumption shall be maintained. The cost of diesel will be borne by the bidder in accordance to the accepted log book and standard consumption of the engine as per manufacturer's recommendation.
- (y) The GAD (General arrangement drawing) should include all the units for the design requirement of capacity as mentioned in Bid documents (intermediate) as well as units for ultimate requirement. The placement/layout of units (for Bid capacity requirement as well as ultimate requirement) should be clearly shown in the available land area.
- (z) For effective online monitoring of all units of STP,s shall be connected and integrated through the SCADA system and should be integrated with EIC's computer system.
- (aa) Bidder shall provide, Install and monitor CCTV system with eight slot CPU, Monitor and eight infra red Night vision cameras with 30 days data breakup at following location of STP,s (Excluding Septage) :

(i)	Inlet & Sump	1 nos
(ii)	Grit separator/Flow Measurement	1 Nos
(iii)	Secondary treatment units	2 Nos
(iv)	Administrative / control building room	1 nos
(v)	Testing Lab.	1 nos
(vi)	Treated water underground Tank	1 nos
(vii)	Main gate & Campus security.	2nos

The Bidder should install at least two CCTV computer during execution period which after commissioning can be used for plant.

Details of Operations - Scope of Work

The scope of work under this contract broadly comprises in further clauses but not limited to: -

All the cost for operation and maintenance of the STPs and their treated water pumping stations(if any) such as manpower, chemicals, fuel, spares, tools, transportation, disposal of treated effluent, disposal of sludge, disposal of screenings and grit, maintenance of civil structures, electrical and mechanical equipments, entire plant automation and payment of electric bill for construction and O&M. The Bidder's scope of work includes preventive maintenance, repairs and replacements of machineries and equipment if necessary. No extra payment other than whatever has been fixed by the department in the financial bid will be entertained.

2.0 Supplementary Requirements

Facilities for the Procuring Entity and his Representatives

The Bidder shall provide upkeep, and maintain the following facilities for the Procuring Entity and Procuring Entity's Representative during the time for

completion of the works at all the campuses of proposed STP's. The cost for these facilities shall be included in the Contract Price.

2.1 Site Office

2.2 Site Office furniture

All the operating expenses, water, lights and other charged shall be regarded as an inclusive cost of the Bidder's operating costs and part of the contract price. The equipment, furniture and furnishings shall include:

- 3 Nos. of 5' x 3' table with both side drawers (3 on each side)
- 2 Nos. of 3' x 2' table with single side three drawers
- 15 chairs
- 2 Nos. of Steel cupboards (Store well type or similar approved)
- 1 No. Drawing Cabinet
- Nos. of 4 Drawers Filing cabinet
- Water supply/Plumbing/Electrical complete
- Computer Table and Chair – 2 No. each

2.3 Equipment

Computer should be with latest configuration with printer and internet facilities. It should be installed with all required software for project management and designs exclusively for respective ULB's engineers.

2.4 Office Fittings:

All necessary fittings for proper lighting of rooms and to maintain comfortable temperature within the rooms as per respective **Nagar Nigam/UIT's** requirements.

2.5 Personnel as specified In section VIB clause 22 & 23 of tender document.

2.6 Maintenance of the Site

The Bidder shall allow for maintaining the all sites of town equipment and related services until expiry of the Contract period or until such time as the aforementioned facilities are, with the permission of the respective **Nagar Nigam/UIT's** Representative, removed.

During the course of executing the construction work at the various treatment plant modules or units if directed by the Engineer-in-charge, the Bidder shall construct a chain link fencing for the safety of the operators at the existing site and the labour and staff deployed at the proposed site. Chain link fencing and gate shall be provided as specified elsewhere in the tender document.

2.7 Areas outside the Site

In the event of the Bidder making use of any special or temporary way or accommodation acquired by him or any tip for the disposal of surplus materials, or any borrow pit or quarry, he shall obtain the written consent of the owner, occupier or authority having charge of the land in which such way, accommodation or tip is situated and shall make a record agreed by the owner, occupier or authority as aforesaid of the condition of the surface of that land before entering thereon.

The Bidder shall permit the respective **Nagar Nigam/UIT's** and their representative and any person authorized by them to access for the purposes of the Contract to any such special or temporary way or additional accommodation.

In the event of the Bidder making use of any special or temporary way leave or additional accommodation mode available to him by the respective **Nagar**

Nigam/UIT for the purpose of the Contract, the land in which such way or accommodation is situated shall be deemed to be part of the Site. On completion of the works at site, the Bidder shall reinstate the area to its original condition to the satisfaction of the respective **Nagar Nigam/UIT's** Representative.

For the purposes of this Clause, 'accommodation' shall be deemed to include housing, offices, workshops, warehouses, and storage areas.

2.8 Road Works

The Bidder shall construct a road for access to his office and all of each works site, which shall be separate from the existing approach road to the plant. The Bidder shall obtain all permits required for carrying out works such as excavation, if required, on public roads and shall liaise with the appropriate authorities with regard to the timing and execution of the road works.

The Bidder shall be responsible for establishing and maintain temporary road/drain diversions required for execution of the works. The Bidder shall reinstate all the roads to the satisfaction of the respective **Nagar Nigam/UIT's** representative after completion of works.

2.9 Maintenance of Existing Access Roads

The Bidder shall only use existing access roads within the Site boundary, which are necessary for the execution of the works. The Bidder shall obtain the respective **Nagar Nigam/UIT** Representative's approval in writing before utilizing existing access roads within the Site. Once the respective **Nagar Nigam/UIT** Representative's approval has been given, the Bidder shall be solely responsible for the maintenance of the existing site access roads (if any). This responsibility shall continue until the completion of the Defects Liability Period, or until such earlier date as the respective **Nagar Nigam/UIT** Representative may advise the Bidder in writing. Such maintenance work shall include general upkeep and any necessary repairs to damaged road surfaces, pavement, drainage, associated slopes, etc to a standard at least equal to their original condition. While carrying out such maintenance work, the Bidder shall make arrangements to maintain through passage for the respective **Nagar Nigam/UIT** and his staff's vehicles and also those of other Bidders over these access roads, which may comprise temporary diversions all to the approval and satisfaction of the respective **Nagar Nigam/UIT** Representative.

The Bidder shall not run tracked or un-sprung vehicles on surfaced roads without the written approval of the respective **Nagar Nigam/UIT's** Representative who may require that planking or some other protective material be used to protect the road surface.

2.10 Clearance of the Site

The Bidder shall clear the all the Sites to the extent required by the respective **Nagar Nigam/UIT** Representative for checking the setting-out.

Clearance of the Site shall also include demolition and removal of all articles, pumping out the accumulated water at Pumping Station Sites, excavation/filling by earth, objects and obstructions, which are expressly required to be cleared.

The Bidder shall ensure that the parts of the Site to be occupied by the proposed Permanent Works are clear, and shall maintain the remainder of the Site as may be required for access and temporary works areas required for the project.

The Bidder shall remove the material arising from such clearance and dispose of it in a manner at a location, to the approval of the respective **Nagar Nigam/UIT** Representative.

The Bidder shall fill and make good with appropriate materials those cavities and losses of soil, which result from clearing the parts of the Site not subsequently to be occupied by the Works.

The Bidder shall not clear the Site of any existing structure without the prior written instruction of the respective **Nagar Nigam/UIT** Representative.

2.11 Clearance and Reinstatement of the Site on Completion

On completion of the Works, the Bidder shall clear any temporary works and temporary access roads and reinstate the areas to their original condition and to the satisfaction of the respective **Nagar Nigam/UIT's** Representative.

2.12 Access for the ULB and ULB Representative

The Bidder shall permit the respective **Nagar Nigam/UIT** and the respective **Nagar Nigam/UIT** Representative and any person authorized by the respective **Nagar Nigam/UIT** or the respective **Nagar Nigam/UIT** Representative including workmen of the respective **Nagar Nigam/UIT**, other Bidders or utility undertakings access for the purposes of the Contract to all areas of the Site and to any additional accommodation or temporary way leave for the duration of the Contract period.

2.13 Water Supply and Wastewater Disposal at Site

The Bidder shall make his own arrangements for water supply during construction at site and he shall ensure the quality of the water remains potable for the purpose for which it is intended. The Bidder shall also conduct weekly/bi-weekly test for water quality and comply with the quality requirements, as directed by the respective ULB's representative.

2.14 Latrines and Washing Facilities

Throughout the period of construction of the Works the Bidder shall provide, maintain and cleanse able and sufficient latrines and washing facilities for use by his employees. He shall ensure that his employees do not foul the Site but make proper use of the latrines. Where practicable, the latrines shall be connected to the nearest sewer, or if this is not practicable the Bidder shall provide an adequately sized septic tank and soak-pit.

The Bidder is also to provide separate latrines to the above requirements for the entire respective ULBs Representative's staff.

After completion, the latrines and washing facilities shall be removed, all ground disinfected and the surface reinstated to the satisfaction of the respective **Nagar Nigam/UIT's** Representative.

2.15 Electricity for Bidder's Use on Site

The Bidder shall be responsible for provision and distribution of an electrical supply for the purpose of constructing and O&M.

The installation shall comply with all the relevant regulations, Indian Standards and Codes of Practice, and Health and Safety requirements, etc. The Bidder must take every possible precaution to ensure that his installation is safe and injury to personnel or damage to plant and buildings is avoided. The Bidder shall be fully responsible for all safety SBR etc.

The Bidder shall test the temporary site distribution system every 3 months for compliance with the relevant standards.

2.16 Refuse Disposal on Site

Refuse and rubbish of every kind shall be removed from the Site and disposed off by the Bidder at his own expense, frequently and regularly so as to keep the Site in an approved wholesome, hygienic and tidy condition to the satisfaction of the respective **Nagar Nigam/UIT's** Representative.

3 Instrumentation and Control Philosophy

The instrumentation and control schemes proposed for the STP shall comprise the following. The list given below is not exhaustive but indicative of the level of instrumentation / automation required for successful operating and maintaining the plant. The minimum level of automation shall be ensured such that the plant operations and effluent quality parameters are not deteriorated due to lack of operator attention in night shifts.

1. Pressure indicating system.
2. Level sensing, transmitting, indicating, alarm & annunciation of levels in tanks, sumps and flow channels as well as interlock and control function with associated equipment.
3. Flow measurement system.
4. Dissolved oxygen analyzing system as well as associated interlocking with blowers / delivery valves to optimize the energy consumed.
5. Fully automatic operation, interlock, monitoring, logging, printing, event as well as report generation etc., through PLC based PC and printer along with associated hardware and soft wares.
6. Alarm & annunciation system to annunciate the plant equipment malfunction and tripping on fault as well as any other abnormality sensing.
7. Manual override facilities shall be provided at all places where PLC controls the operations.

4 System design, detailed design and drawings

As specified above

5 Setting Out

The lines, levels and setting out points for works are indicated in the Drawings included in Section 9. The drawings are indicative only. The Bidder shall submit all drawings based on his process design, layout and hydraulics.

6 Construction Documents

These documents shall include:

- Unit sizing of the process and sizing of all components of the plant including mechanical & electrical equipment supported by P & I diagram, Piping diagram, GA drawing of various units and buildings etc.;
- Layout Plan and hydraulic profile;
- Architectural Drawings/Renderings;
- Detailed structural design and good-for-execution (construction) drawings pertaining to all components of the plant;
- Drawings showing the size, position and other necessary details of all mechanical and electrical equipment and fixtures;
- Wiring diagrams, power & motor control gear in power cum Motor Control Center and motor control center;
- Details of foundations, position of openings, etc., for the pumps, motors, Blowers, starter modules, Low and High tension panels, etc;
- Elementary diagram and manufacturers' shop and part drawings for each equipment, including cut section drawings;
- Drawings depicting services like internal illumination and ventilation, building water supply, sanitation and plumbing, service roads, landscaping, area lighting, storm water drainage etc;

- Any other design and drawings to comply with the Procuring Entity's requirement as indicated in Section 5, Technical Specifications.

The documents and drawings shall be in sufficient detail for review of the Procuring Entity's Representative. The scale of the drawing has to be chosen accordingly in coordination with the Procuring Entity's Representative in respect of hard copies, the soft copies shall normally be made available on actual scale basis. The drawings shall be of standardized sizes and as instructed by the Procuring Entity's Representatives. The drawings shall contain the following basic information in the nameplate:

- Project name
- Name and number of the Contract
- Bidder's name
- Number and title of the drawing
- Date
- Draftsman's name
- Revision Number (R0 for drawing submitted initially and R1, R2, etc., for drawings submitted subsequently).

A blank space 90 x 50 mm shall be provided immediately above the title block for the approval stamp. If required, the detailed design and the execution drawings shall be submitted only after verification by an institute approved by the Procuring Entity.

A. Smart Solutions

Smart Solution no. 1 -

- De-centralized approach versus centralized approach has been evaluated and de-centralized approach is found appropriate looking to re-use of treated waste water. Hence, de-centralized approach has been adopted.
- Re-cycling of water for beneficial purpose and re-use of treated waste water has been ensured and re-use plan has been prepared.

Smart Solution no. 2 –

The proposed STP shall be fully automatic with provision of mechanical screens, motorized gates and valves, Grit separator, Bio-reactor disinfection, Centrifuge, PLC, SCADA, Laboratory (one for each STP), on-line monitoring of effluent parameters such as BOD, COD, Suspended solids, Nitrogen, Phosphorous, etc

Smart Solution no. 3–

The effluent parameters adopted are as per latest directions of CPCB and are less than

- PH – 6.5 – 9
- BOD – 10 ppm
- COD – 50 ppm
- TSS – 10 ppm
- NH₄ – N = 5 ppm
- N total – 10 ppm
- PO₄ – P = 2 ppm

B. Specifications for online instrument

Bidder shall be required to make all arrangement for online monitoring of BOD, COD, PH, SS, Nitrogen, Phosphorus, dissolved oxygen and ammonia-N and shall be required to integrate it with PLC & SCADA of the STP.

The online monitoring equipment of performance guarantee parameter should be precise enough so that any difference between their reading and laboratory reading lies in permissible limit as per relevant code.

Bidder shall be required to integrate the output wirelessly with SCADA of the STP.

All the yard lighting should be fitted with solar panels, LED lights and integrated with the SCADA of STP. The above system should be designed so as to create smart network, whereby all the components of STP, yard lights and strategically located MHs are connected and controlled by centralized SCADA of the STP.

The online output of SCADA showing current quality control parameters be available on mobile phones.

The SCADA should be coupled with PLC of adequate memory (min. 64MB memory); flash memory (min. 1GB) and controller clock speed 500 MHz or better.

The smart solution includes the solar power generation for the substantial requirement of pumps for which rooftop of buildings and open area shall be utilized.

Sub Section - 3

Treatment works – Plant Specifications

The following sections deal with the work of sewage treatment plant related to the general civil works and certain mandatory sizing criteria as applicable. The corresponding specifications relating to civil, mechanical including piping & valves, instrumentation and electrical, are presented in sub-sections III to VI and which have to be read in conjunction with this section.

General Guidelines for level of STP and Invert depth

The Bidder is advised to have a site visit and verify the site levels. Each STP should be designed, such that the complete process is completed with least of power consumption, also each STP should be at sufficient height with respect to HFL of area to avoid flooding.

1.1.1 Quantity of Raw Sewage

The sewage generated will progressively increase with increase in coverage and connectivity. For this package STP's facility is to be created suitable for the average flows mentioned above.

Design flow for which units are to be designed:

1. Ultimate Peak Flow: Inlet chamber, Coarse Screen
2. Intermediate Peak Flow: Fine Screen, Grit Separator, SBR, Chlorinator and other units.

A. INLET ARRANGEMENT

1. Inlet chamber

Flow from sewer will terminate into inlet Chamber, which opens in to two Coarse Bar screen channels by gates. Inlet chamber shall be designed with respect to the modules proposed in future ultimate flow for STP with the provision of gate to divert the flow for future requirement.

B. PRIMARY TREATMENT

1. Coarse Screen Chamber (2 nos).

These channels will be fitted with coarse bar screen for removal of big objects, floating objects, etc. One Channel will be stand by and one will be working. The bar screens will be coarse type mechanically operated. These are to be provided with S.S. 316 Bar Screens, with 50 mm openings and S.S. 316 flats size is 10 mm x 50 mm. The channels will be in R.C.C. The purpose of this channel is to remove (large size particles and debris which otherwise will enter the wet well and clog the pumps). The limiting velocity through the openings will be 0.8 to 1.2m/sec. at peak flow and min. horizontal velocity at minimum flow will not be less than 0.3 m / sec. One screen shall be provided with mechanically cleaned bar screen. Other Screen shall be provided with manually cleaned bar screen.

These screens shall be designed and constructed in a suitable size based on the required average flow with peak factor 2.25. Screen Channel will be discharging in to raw sewage sump; gates shall be provided to isolate the screen channels to easy during maintenance. A weir should be constructed after the both screens and before raw sewage sump for formation of mat and increase the efficiencies of screens.

2. Raw Sewage Sump (Wet well) & Pump.

The wet well shall be designed as per CPHEEO manual for stipulated average flow of each STP as mentioned above in this section and it will be constructed in R.C.C. (M30) in circular shape. A channel shall be provided in the sump to facilitate at least five no pumps in such a way that pumps always remain submerged and suction of pump is not obstructed. Pumps shall be sized to cater low average and peak flow conditions. Selection of pumps capacity shall be done as per the norms specified in CPHEEO manual. The bottom floor will slope towards pump channel side. Pump channel will be of adequate height and width to house pumps which will be always in submerged condition. The norms for arrangements spacing etc. of pumps shall be as per CPHEEO manual guide lines and min. submergence as per pump manufacturer's requirements. There will be high level and low level alarm and tripping system installed. Pumps shall be equipped with sensors to stop and start automatically.

Bidder may alternatively offer Archimedean screw type pumps for pumping the raw sewage if required. In this case the bidder can decide his own configuration of raw sewage sump to suit the Archimedean screw pumps, and adopting suitable length so as to discharge to the fine screen chamber. However bidders shall quote only for one type of raw sewage pumps both in their technical and price bid.

Pump Room

Pump Room will be built at suitable location. Size of pump room shall be such as to facilitate all ancillaries and instrument for STP & Pumping station (if any) located in the same campus. There will be a gantry crane of required capacity (as approved by EIC for each plant) with chain and pulley block on the ceiling of pump house. Towards the side of pumps, the floor will have open space, adequate to handle pump removal, installation etc.

Discharge pipes & common Pumping mains

Discharge pipes from each pump will be well connected to a common discharge header with necessary fittings. The individual discharge lines fittings and common header shall be in DI Class K-9 material conforming to IS: 8329. Valves shall be in CI.

Common header shall be connected to Inlet Chamber (stilling chamber) of fine screen and secondary treatment units of stipulated average capacity Sewage Treatment Plant (STP). Bidder has to ascertain this for himself by making visit of project area and location of different components of the project. Pumping main shall design for stipulated average flow of each STP with peak factor 2.25.

Submersible Sewage Pumps:

Pumps shall be non clog type with cutter impeller and shall be suitable for sewage application. Pump Impeller shall be in SS316 Construction. Pump Body shall be in CI.

Guide rail, auto coupling for connecting pumps to fixed delivery line, chain for pulling pumps etc all accessories whatsoever required for smooth operation and easy maintenance of pumps shall be provided. Pumps configuration shall in such a way so that lean flow, average flow and peak flow shall be handled without any over flow situation from the sump. There shall minimum four pumps which are to be configured looking to above conditions i. e two pumps of half average flow , one of average flow and one of peak flow.

Delivery pipes of the pumps shall be fitted with pressure gauges motorized valves of suitable sizes. Individual delivery lines shall be connected two a header that will be leading to Inlet Chamber (stilling chamber) of fine screen.

Operation of pumps shall be automatic based on the level of sewage in the Raw sewage sump. A control system consist of Ultrasonic type level controller shall be provide. Control panel for the pump shall also have facilities for detection of seal breakage, pump

temperature, dry running etc. audiovisual alarm for indication of malfunctioning shall be incorporated in the pump control panel.

3. **Stilling Chamber (Inlet Chamber) (1 no)**

Inlet Chamber will receive raw sewage from Raw Sewage Pumping Station. It shall be designed for Peak Flow. The entire construction shall be in **M 30** grade reinforced cement concrete and as per IS 3370. RCC Platform/Walkway, minimum 1.00 m wide with Hand Railing as per specifications shall be provided. RCC Staircase, minimum 1.00 m wide with Hand Railing as per specifications shall be provided for access from Finished Ground Level to the top of the Unit & to the Operating Platform/Walkway.

Average Flow : stipulated capacity of each STP as mentioned above in this section

Peak Factor : as per CPHEEO manual

Number of Units : 1 No.

All other accessories, whether specified or not, but required for completion of Contract shall form the part of Bidder's Scope.

4. **Mechanical Fine Screens Channels.**

Both screens shall be Mechanically operated (one-Working+ one Standby) shall be provided in Fine Screen Channels. Each Fine Screen Channel shall be designed for Peak Flow. The entire construction shall be in **M 30** grade reinforced cement concrete and as per IS 3370. RCC Platform/Walkway, minimum 1.00 m wide with Hand Railing as per specifications shall be provided. RCC Staircase, minimum 1.00 m wide with Hand Railing as per specifications shall be provided for access from Finished Ground Level to the top of the Unit & to the Operating Platform/Walkway.

The clear opening shall be 6 mm. The Screens shall be made of SS 316 flats. Conveyor Belt and Chute arrangement shall be provided to take the screenings. Screenings dropped from Chute shall be collected in a wheel Burrow. Manually operated aluminum Gates shall be provided at the upstream and downstream ends to regulate the flow.

Average Flow (for STP) : stipulated capacity of each STP as mentioned above in this section Peak

Factor : as per CPHEEO manual

Number of Units : 1 (Working) + 1 (Stand by) each of Peak Flow capacity.

Approach Velocity at Average Flow : 0.30 m/s

Velocity through Screen at Average Flow : 0.60 m/s max.

Velocity through Screen at Peak Flow : 1.20 m/s max.

Free Board : 0.30 m min.

All other accessories, whether specified or not, but required for completion of Contract shall form the part of Bidder's Scope.

1.1.1.1.1 An Ultrasonic type level sensor and transmitter shall be provided in the channel upstream of screen chambers to start/stop the screen drive mechanism.

1.1.1.1.2 A high level alarm switch shall be provided in the event the sewage rises beyond working level due to choking or improper functioning of the screen then gates of that particular screen shall be closed. Conveyor operations will depend on functioning of screen. The Conveyor will start whenever mechanical screen works and stop after a lag of 2 minutes after the screen drive stops. Similarly, if the conveyor stops due to some fault or on over load, the screen will trip and the alarm annunciation shall appear in the instrument panel of PLC.

5.0 GRIT SEPARATOR UNITS (2 NOS)

- 1.1.1.1.3 These are 2 nos grit Chambers, each shall be designed for stipulated capacity of each STP as mentioned above in this section average flow with peak factor 2.25 both are mechanical type. These are provided to arrest all the inorganic grit of size 100 micron and above with a specific gravity of 2.4 to 2.65. Tanks shall be design for fitting de-gritting mechanism and grit washing equipment. Suitable landing arrangements, steps and platforms shall be provided by Bidder to facilitate access to the unit. Each grit chamber shall be designed and constructed in a suitable square shape size based on the stipulated capacity of each STP as mentioned above in this section average flow with peak factor 2.25.
- 1.1.1.1.4 The de-gritted sewage shall flow through open channels from both the grit separators and confluence into a single channel of suitable width for provision of Parshall flume. The sewage from parshall flume shall again flow through a common channel before distributing to secondary unit. The isolation gates shall be provided at the inlet and outlet of screen and grit chamber so that any of the streams can be isolated. When the load on the rake mechanism increases a local electro-mechanical indicator, which will be a part of the drive, shall sense the same and send a signal for alarm annunciation of torque overload through PLC for subsequent corrective action. If the corrective action is not taken and torque further increases to more than the pre-set value then drive motor shall be tripped through PLC with alarm annunciation. Similarly, if the grit classifier screw trips due to overload, an alarm annunciation shall be provided through PLC in the instrument panel. When above fault occurs the specific grit separator shall be taken out of service by isolating gates and rest of the grit separators will operate for full flow reaching the plant at the time. The weir loading and surface loading shall be as per CPHEEO manual.
- 1.1.1.1.5 Detritor With Classifier & Organic Return Mixer (Pump):
- 1.1.1.1.6 Two No. Grit Chamber shall be provided with detritor and classifier mechanism
- 1.1.1.1.7 Detritor (Detritor with Classifier) shall be suitable for a Degritting tank provided The Detritor mechanism shall be of moving rake type and shall comprise of comprise of the following:
- 1.1.1.1.8 Detritor mechanism shall comprise of central drive located on full bridge.
- 1.1.1.1.9 Central drive shaft shall be in SS304 construction. Scraper arms with scraper blades and scoop shall be in SS304 construction. This shall be fixed at the lower end of the shaft and shall be designed to effectively push the grit towards circumference and subsequently to push through the opening to the bottom end of the classifier.
- 1.1.1.1.10 Detritor drive shall be provided with suitable rating and RPM electrical motor, Overload alarm shall be provided for indication of overload conditions. Turning vanes for flow control at inlet side in detritor shall be provided in SS304 construction. Weir plate in SS304 const. shall be provided at the outlet channel with necessary clamps in SS 304 and anchor fasteners in SS -304 construction.
- 1.1.1.1.11 Scraper frame, rag screen, stay rods and shaft shall be in SS304 construction.
- 1.1.1.1.12 Classifier shall have a reciprocating rake mechanism driven or screw conveyor type shall be provided with electrical motor and reducer of suitable. All components of classifier mechanism shall be in SS304 construction
- 1.1.1.1.13 Each Mechanism shall be provided with Organic return pump (mixer). This shall be suitably located to return organics back to Grit Chamber. The organic mixer shall have specially designed impeller to create washing action. Shaft and impeller of the mechanism shall be in SS-304 material. Suitable size Electric motor shall be provided with each mechanism hardware/anchor fasteners shall be in SS-304 constn. The entire construction shall be in M 30 grade reinforced

cement concrete and as per IS 3370. RCC Platform/Walkway, minimum 1.00 m wide with Hand Railing as per specifications shall be provided. RCC Staircase, minimum 1.00 m wide with Hand Railing as per specifications shall be provided for access from Finished Ground Level to the top of the Unit & to the Operating Platform/Walkway.

Average Flow	: stipulated capacity of each STP as mentioned above in this section
Peak Factor	: as per CPHEEO manual
No. of Units	: Two Mechanical (1 Working) and one (Stand by) each of Peak Flow capacity.
Type	: Mechanical
Size of grit particle	: 0.15 mm
Specific gravity of grit	: 2.65
Free Board	: 0.50 m min.

All other accessories, whether specified or not, but required for completion of Contract shall be in the part of Bidder's Scope.

6.0 FLOW MEASUREMENT

1.1.1.1.14 There will be one number Parshall flume flow measuring channel in R.C.C. which will be capable of measuring flow of stipulated capacity of each STP as mentioned above in this section average with 2.25 P.F. There will be an approach channel, a throat, and a downstream channel. At the throat, there will be a hydraulic jump and a corresponding head loss. There will be a meter mounted above the channel to measure the flow, record it and integrate it. Recorder and integrator will be housed in the control room. Only flow indicator will be field mounted. Alternately an Ultra sonic flow meter can be provided for flow measurement. Parshall flume shall be designed as per CPHEEO manual

C. SECONDARY TREATMENT

7. Process

Secondary treatment Units shall be design based on Cyclic Activated Sludge Technology (Sequential Batch Reactor), in which filling in reactor shall not be allowed during settling or decanting..Process and equipment performance shall be controlled by well tried software. An instrumental control system that regulates timed sequences for filling, reaction, settling and effluent decanting (All the Cyclic Processes). It should possible to vary cycle timings as per the requirement. STP should have at least two basins

Each basin /batch reactor shall consist of a tank equipped with an inlet for raw sewage, air diffusers, with associated compressors and piping for aeration; a sludge draw-off mechanism for waste sludge; a decant mechanism (mechanized swing controlled decanter equipped with scum baffles) to remove the supernatant after settling; and a control mechanism to time and sequence the processes.

Design and operational guidance given in the latest edition of CPHEEO manual should be adhered to Bidder shall also provide all ancillaries that are required for proper working of the STP Units for post treatment by chlorination as well as for mechanical sludge drying etc shall also be included in scope of work. Minimum requirement of treatment plant units, ancillaries equipment, instrumentation etc shall be strictly as per the latest CPHEEO Manual, SBR tanks shall have minimum side water depth as 6m. Free board in all the units shall be minimum 0.5m. Minimum requirements of processing units and equipments are given in subsequent sections. Units and dimensions of units and ratings of equipment mentioned here below are minimum requirements, if Bidder feel bigger dimension units and higher capacity/ratings of equipment are required to achieve desired treated water quality, he shall offer the same.

Plant and ancillaries shall be designed to achieve desired treated water quality with easy, cost effective and normal operation of plant and least utilization of consumable chemicals.

a. Process Design

- Secondary Treatment Units shall be installed and equipped for stipulated capacity of each STP as mentioned above in this section average flow.
- The complete biological system shall be designed for handling peak flow.
- Suitable Nos. of units/ Basins with adequate volume shall be provided. In addition, 0.50 m Free Board shall be provided to each Basin.
- The entire construction shall be in M30 grade reinforced cement concrete and as per IS 3370. RCC Platform/Walkway, minimum 1.20 m wide with Hand Railing as per specifications shall be provided. RCC Staircase, minimum 1.20 m wide with Hand Railing as per specifications shall be provided for access from Finished Ground Level to the top of the Unit & to the Operating Platform/Walkway. Plinth protection along periphery shall be provided as per technical specifications.
- The system should work on a gravity influent condition. No influent / effluent Equalization Tanks or flash filling is accepted.

b. Aeration System

- The aeration facility shall be installed for stipulated capacity of each STP as mentioned above in this section average flow.

c. Sludge Pumps

Sludge dewatering Pumps shall be provided in each unit/ Basin. Capacity and Heads shall be decided based on process requirements. Each secondary treatment unit shall be provided with suitable lifting arrangements to facilitate lifting of these Pumps if required for maintenance.

I. Sludge Pumps

Capacity and Head : As per requirements

Type	: Submersible / Horizontal Centrifugal
Quantity	: per Basin one working +one standby

d. Automation and Control

- PLC based Automation System with application software based on Rockwell or equivalent to control the STP process System including all Gates, Air Blowers, Pumps, Valves and other associated instruments as per requirement.
- SACDA based Automation System shall be installed SBR for various treatment units

e. Disinfection (Chlorination) Units

Disinfection (Chlorination) Units including Chlorination cum treated water underground tank and Chlorinator cum Chlorine Tonner House shall be designed for Average Flow.

Chlorination cum treated water underground tank and Chlorinator cum Chlorine Tonner House

Treated sewage from STP treatment unit outlet shall be taken to Chlorination cum treated water underground tank by RCC Channel/RCC Pipe of Class NP3/GRP. Gas Chlorine shall be added for disinfection at suitable dosing rate. Baffle walls shall be provided in the Tank to facilitate hydraulic mixing of treated sewage. The entire construction shall be in M30 grade reinforced cement concrete and as per IS 3370.

Design Flow	: stipulated average capacity of each STP as mentioned above in this section
Number of Units	: 1 No.
Free Board	: 0.50 m min.

f. Chlorination System

Design Flow	: stipulated capacity of each STP as mentioned above in this section
Quantity of Chlorinator	: 2 Nos. (1Working + 1Standby)

All other accessories, whether specified or not, but required for completion of Contract shall form the part of Bidder's Scope.

D. Solids and Sludge Handling**8. SLUDGE DEWATERING UNITS**

Sludge Dewatering Units comprising of Mechanical Sludge Dewatering Device (Centrifuges) with Centrifuge Platform, Centrifuge House and Dewatering Polymer Dosing System shall be designed for Average Flow at each STP.

a. Sludge Sump (if req.)

A Sludge Sump (if req) shall be provided to hold excess sludge from SBR Basins. It shall be equipped with Coarse Bubble Air Grid made from HDPE / UPVC Pipes and Air Blower piping to facilitate mixing of its contents on continuous basis. It shall be constructed in **M30** grade reinforced cement concrete and as per IS 3370.

Design Capacity	: As required for stipulated capacity of each STP as mentioned above in this section
Number of Units	: 1 No.
Free Board	: 0.50 m min.

b. Sludge Transfer (Centrifuge Feed) Pumps

Capacity and Head	: As required for stipulated capacity of each STP as mentioned above in this section
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Quantity : 2 Nos. (1W + 1S)

All other accessories, whether specified or not, but required for completion of Contract shall form the part of Bidder's Scope.

c. Mechanical Sludge Dewatering Device (Centrifuges) and Centrifuge Platform

The Mechanical Sludge Dewatering Device shall be Multi -Disk plate Screw Press(VOLUTE) type Centrifuges designed for 100% trouble free operation at all times and provided as per the following guidelines/ specifications:

Multi-Disk plate Screw Press shall have a flow control tank to fix sludge flow and a water level adjuster to return the excess amount of sludge when necessary. Multi-Disk plate Screw Press shall have a flocculation tank(s) to mix sludge with polymer to separate solids and liquid. Sludge feed pump and polymer feed pump shall be interlocked with the equipment. The main body of Multi-Disk plate Screw Press shall have a drum being composed of accumulated rings and a screw going through inside the drum. Solids and liquid shall be separated by the pressure caused by the screw. Filtrate water shall be discharged from the first part of the drum, from the gaps between the accumulated rings. The accumulated rings shall be sorted into two types; moving rings and fixed rings. The internal diameter of the moving rings shall be smaller than the diameter of the screw so that the screw shall push the internal edges of the moving rings. The moving rings move continuously in the gaps between the fixed rings when the screw rotates, which shall clean the gaps and prevent clogging. The separated solids shall be discharged from the end of the drum. Multi-Diskplate Screw Press shall dewater directly thin sludge with its concentration at 0.2% at minimum, discharge sludge cake with its solids content at 15% at minimum and catch 90% solids fed. The main material of Multi-Disk plate Screw Press shall be SS304. The noise caused by Multi-Disk plate Screw Press shall be 65dB and the vibration caused by Multi-Disk plate shall be 50dB.

d. Polyelectrolyte Dosing System

Polyelectrolyte shall be dosed online at the inlet of Centrifuges.

DWPE Dosing Tank

Design Capacity : As required for stipulated capacity of each STP as mentioned above in this section

Number of Units : 2 Nos.

Free Board : 0.50 m min.

The solution will be dosed using mechanically actuated diaphragm type Metering Pumps. Dosing Pumps shall be provided and shall be interlocked with Centrifuges in such a way that they Start/Stop along with Centrifuge.

DWPE Dosing Pump

Capacity and Head : As required for stipulated capacity of each STP as mentioned above in this section

Quantity : 2 Nos. (1W + 1S)

9. Air Blower cum Administrative cum MCC & PLC/Control Building(For each STP)

The Air Blower cum Administrative cum MCC & PLC/Control Building shall be G+1 type RCC Frame and Brick Masonry Structure. Air Blower House, Workshop & Tool Room shall be constructed at ground floor whereas Administration Block (comprising Office and Laboratory), MCC Room and PLC/Control Room can be placed at first floor.

Air Blower House shall house Air Blowers for Unit/Basins. It shall be equipped with Rolling Shutters, Windows/Ventilators, Exhaust Fans and an Electric Hoist with Travelling Trolley / monorail of minimum 1 Ton capacity or 1.5 times the weight of Air Blower whichever more is. Similarly, MCC Room and PLC/Control Room shall be designed.

Laboratory shall be fully equipped with all necessary Equipments, Instruments, Chemicals, Reagents, Glassware and Furniture.

Adequate number of Toilets and Wash basins shall be provided separately for Men & Women at each floor. A covered Overhead Tank shall be provided along with an Underground Water Tank to cater to the water requirements of the Building. One no. of mono block submersible pump set shall have to be provided for lifting water from U.G. water tank to O.H. tank.

10. Instrument & Control Philosophy

The instrumentation and control of sewage treatment plant is semiautomatic and with Programmable Logic Controller (PLC) based PC system. The details of instrumentation, control and automation to be provided in the STP are described in brief below.

A) Preamble

The instrumentation scheme in STP mainly consists of pressure indicating and control system, level sensing, with indicating, interlock and control functions of associated electrical drives and system, flow measurement system, dissolved oxygen measurement with indication, interlock and control functions of variable frequency drives and associated system and alarm annunciation system connected with plant equipment connected with plant equipment abnormal functioning.

B) Instrumentation and control and interlock schemes Philosophy

- a. Ultrasonic level sensing and measurement system with ultrasonic level sensor and transmitter to be located in the raw sewage upstream channel of the coarse screen, level indicating controller and Level alarm and annunciation (high and low level) windows in the instrument. Panel cum control desk is proposed. Whenever the level in the channel is low, the signal generated from the sensor is transmitted to the panel instrument and thereby indicating the level as well as alarm annunciation of low level in the channel and simultaneously sending the trip signal through PLC to PMCC/MCC for tripping the coarse screen and conveyor. Similarly when the level is high in the channel, the sensor sends the signal through the transmitter to the PLC and panel instrument as well as alarm / annunciation windows for high level annunciation as well as sending a start signal to the PMCC/MCC for starting the coarse screen and conveyor. When the conveyor stops due to over loading and/or on some other fault coarse screen also stops.
- b. Level switches are proposed in the raw sewage sump to sense transmit low-low, low, intermediate, high, high-high levels in the sump through PLC to alarm and annunciation windows for annunciating the respective levels and also PMCC/MCC
 - (i) To annunciate and stop all the pumps and fine screen when level is low-low.
 - (ii) To annunciate when the level is low
 - (iii) To annunciate and start one of the pumps and fine screen when the level is intermediate.
 - (iv) To annunciate and start the second set of the pumps when level is high

- To annunciate and start all the pumps (other than standby) when level is high-high
- (v) whenever there is a fault in the fine screen, stoppage of fine screen also to stop the raw sewage pumps
 - c. Dissolved oxygen analyzer with sensor and transmitter is proposed to be installed in the secondary treatment unit to sense and transmit the signal of the DO value through the PLC to the DO indicating controller and to the variable frequency drives panels of the air blower which are supplying air to the UNIT/ basin to control the volume of air from the blower into the sump, aeration tank etc, for maintaining the values of DO at the desired level
 - d. Start and stop of electrical drives proposed from the instrument panel cum control desk, local start & stop push button stations and also from PMCC/MCC.
 - e. CPU, PC, Printer and optical mouse along with software and hardwares are proposed and interlinked with PLC monitoring, logging, storage and printing of events & values other required parameter of the plant operation and control

The above requirement is minimum for the plant operation. Bidder shall provide additional requirement based on his design and requirement and provide complete details in the bid.

Note: All units of STP's shall be designed with the conformity of latest CPHEEO manual.

ANCILLARY FACILITIES

11. Laboratory (one for each STP)

The laboratory shall have minimum working platforms of 5 m length with 0.9m width and these platforms shall be of RCC and topped with black granite slabs. There shall be a corner fume hood built of RCC for an area covering 1.2m x 1m width adjoining the walls connected to a fume hood and exhaust fan of 45 cm dia. The elevation of the platforms and fume table shall be 0.9m above floor elevation. There shall be two wall shelves of each 1.2 m wide and 2.1 m height with depth of slabs being 0.45m and there shall be four such slabs in each shelf. All slabs shall be of granite stones. The shelves shall be provided with sliding doors of UPVC with adequate glass paneling. Necessary fans & lights shall be as directed by the Procuring Entity's representative. The laboratory shall be air conditioned with minimum 2 numbers of each 2.0 TR Air conditioner.

The laboratory equipments to be supplied, erected, commissioned and maintained in working condition up to end of O & M period.

12. Security room

The security room at entry to each STP shall be a ground floor construction with 3m x 5m carpet area with toilet and be of RCC roofing and shall be provided with glass panels on three sides and an air cooler. Necessary fans and lights shall be provided as directed by the Procuring Entity's representative.

13. Covered vehicle parking

There shall be provision for sufficient parking for STPs .

14 Landscaping (For STPs campus)

The landscaping of each STP site is in the scope of this package. The open area within the campus after construction of sewage treatment plant shall be developed through adequate greenery comprising flowering bushes, thickets and trees. Treated sewage shall be used for the development. At least 33% of the open area (if available), shall be converted to a green belt/garden as approved by the Procuring Entity's representative. Dense plantation shall be used for control of noise around the Centrifuge and blower buildings. Plantation of large trees and green belt including creepers shall be used around the periphery of the campus to ensure that odours, if at all emitted, get diluted and diffused and a visual barrier is created.

15 Tree Plantation (in available area)

Pit dug a few days in advance of actual planting shall be allowed to weather and be filled with top soil mixed with manure. Size of pit shall be as per standard requirement. Only one tree shall be planted in each pit. Spacing between two rows of trees shall be 3 m c/c. Trees in consecutive rows shall be staggered and shall be planted at 3 m c/c. minimum 500 trees shall be planted and grown at each STP site and nearby area where space is not available. Normally 5 rows of plants shall be planted inside boundary wall, in the area earmarked within each STP site unless otherwise directed. The trees shall be of required species such as Neem (above 50%), Bouganvillea, Amaltas, Gulamohor, Cassia, Suma and Alasfonia (Cholarisis) etc of 2.5 m height suitable climate in the town and shall be grown during the construction and Operation period at site. Bidder shall provide manure, watering plant without extra cost to Procuring Entity during construction and Operation period. This item is covered under O & M and facilities. The Bidder has to start this activity in the first month of the contract.

16 Treated effluent disposal and Compound Wall of Treatment Plant site & Approach Road**A) Disposal of treated effluent**

50% of the treated effluent will be used by the bidder and remaining 50% treated effluent will be made available to ULB/UIT.

B) Compound Wall of STP site and its Main Gates

Bidder shall construct compound wall all around the plot boundary and fix main gates of STP compound facing towards road as per the requirement and approval of Procuring Entity or Procuring Entity's Representative. Bidder shall prepare his own design and drawing and submit the same for approval of Engineer-in-charge. The detailed drawings of compound wall shall include cross-section of wall, elevation, locations of expansion joints in compound wall as per provisions of latest IS specifications, elevation of main steel gates of Treatment Plant site. The length of compound wall is as per site. The wall shall be constructed in 1:6 CM in brick masonry. Boundary wall shall have pillars at a spacing of 3 m. Foundation shall be 125 cm below GL or as per site requirement. Height of wall shall be 1.8 m from GL. Inside and outside wall surfaces shall be plastered in 1:4 CM. However the section of boundary wall shall be approved by engineer in charge.

C) Approach road and Culvert at STP site

Bidder shall construct approach road from the existing roads to proposed STP's site. If needed to cross the drain/ Nallah. The Bidder shall construct Pipe Culverts so as to

connect the proposed STP's site. Bidder shall prepare his own design and drawings per provisions of latest IS specifications and submits the same for approval of Engineer-in-charge.

Some of the important IS codes to be referred during execution of the work are as follows:

IS 3764 – Safety code for excavation works

IS 3720 – Methods of tests for soils

Soil Investigation

IS – 1988 – SBC

Concrete Works

IS.280 – Mild steel wire for general engineering purposes

IS.269 – Portland cement

IS.383 – Coarse and fine aggregate

IS.432 – Medium tension steel bars and hard drawn steel wire

IS.456 – Code of practice for plain and reinforced concrete

IS.516 – Methods of testing for strength of concrete

IS.1199 – Method of sampling and analysis of concrete

IS.1566 – Fabric reinforcement

IS.1786 – Cold twisted steel bars for concrete reinforcement

Reinforcement

- IS. 3370 – Code of practice for concrete structures for the storage of liquids
- IS. 7861 – Recommended practice for hot weather concreting (Part-I)
- IS. 4082– Recommendation on stacking and storage of construction material on site.

General

- IS.875 - Code of practice for structural safety of buildings, loading standards
- IS.1911 – Dead loads
- IS.1893 – Criteria for earthquake resistant design and structures
- IS.2950 – Design of raft
- IS.1200 – Method of measurements

The following activities shall be carried out but shall not be limited to.

- (i) The Bidder shall carry out topographical survey of site along with complete soil investigation like S.B.C., type of soil etc. and submit to Engineer-in-charge.
- (ii) Approval of all designs and drawings, material to be used, equipments specifications and the samples, prior to commencing of work at site.
- (iii) Preparation and submission of all detail working drawings to the Engineer-in-charge.
- (iv) Submission of "As Built" drawings.

No separate payment will be made for the reconnaissance survey, laboratory test, testing and commissioning, etc. This shall be included in the rate quoted by the Bidder.

General RCC

The specification for material shall comply with the specification narrated at relevant chapter of civil works and as written below:

Ordinary Portland Cement (OPC) Grade 43 conforming to IS: 269-1976 mark shall only be used. Cement manufactured in mini-cement plants / PPC shall not be used.

All **reinforcement** used shall be of TMT steel (Fe 415) ISI marked and from reputed manufacturer as approved by Engineer in Charge, shall be clean and free from loose mill scales, rust and coating of oil or other coatings which may destroy or reduce bond. Minimum size of reinforcement bars shall be of 8mm. Only **steel shuttering** shall be used. Shuttering shall be new or in good condition without holes or dents. It has to be approved by the Engineer in Charge. The individual elements should be in the good shape to ensure a gap free shuttering according to the drawings. The paint used shall have good bonding and shall not stick to the concrete surface. Suitable system have to be provided for keeping the surface in place and keeping the correct distance in case of walls. The construction joints should be minimum and they have to be executed with most care. Before continuing concreting the loose material has to be removed and they have to be cleaned properly. Honey combing has to be avoided by suitable shuttering and proper use of vibrators.

The **water** used for concreting shall be free from all undesirable salts and other impurities and shall be fit for concreting as per IS : 456.

It is specifically being mentioned that the ground water available in this area may not be potable and not fit for concreting; therefore **transportation from nearby safe and acceptable water source has to be made**. For the purpose of concreting and curing only potable water conforming to provisions of IS: 456 is to be used. For this purpose Bidder shall make a temporary masonry/RCC **underground water reservoir** of 3 days average water consumption storage capacity. He shall provide a diesel **pump set** and necessary **pipings arrangement** to ensure proper curing.

The exposed surface of concrete shall be kept continuously in a wet condition by pounding or covering with a layer of sackings, canvas, hessian or similar materials and kept continuously wet for at least 28 days from the date of placing of concrete.

To obtain a dense concrete and to reduce chances of honeycombing adequate **admixture** approved by Engineer-in-Charge shall be used e.g. integral water proofing compound in concrete work. The quantity of the admixture shall be as prescribed by the manufacturer and as approved by the Engineer in Charge.

The aggregates and cement shall be proportioned by weight only. The mixing shall invariably be carried out in mechanical mixer and in such a way so as to avoid any loss of water or cement. No hand mixed concrete will be allowed. It should be conveyed, placed in position and compacted by suitable type of mechanical vibrator as rapidly as practicable but in no case the time of compaction after mixing shall increase 30 minutes. Standby Concrete Mixer and Vibrator shall be available at Site.

The concrete shall be cured properly by keeping it moist constantly until end of three weeks from the date of casting.

Testing

Materials and workmanship shall comply with the relevant specifications as described in subsequent clauses and in the Rajasthan PWD (B&R) Specification and Explanatory Notes for Building and House Drainage. Any material or workmanship not covered by the above specifications shall comply with the relevant Indian Standard (with up to date amendments).

Material

The Bidder shall submit to the Engineer-in-Charge or his representative, samples of the materials which will form part of the permanent works, sufficiently in advance of the start of the work, so that necessary tests can be carried out for the approval of the Engineer In Charge or his representative, before using any such material on site. Samples for the basic materials shall be submitted from every supplier and from each consignment; if materials differ from one consignment to another, the consignment differing from the accepted sample shall be replaced by the Bidder free of cost. The format will be provided by Engineer In Charge.

The testing of materials to be used in the Works, or of the quality of finished items shall generally be done in a laboratory approved by the Engineer-in-Charge or his representative. All testing charges shall be borne by the Bidder. The following tests shall be carried on a routine basis:

- (a) Gradation and specific gravity of coarse and fine aggregate to be used for concrete work.
- (b) Moisture content in fine and coarse aggregates, bulking of sand of fine aggregate.
- (c) Determination of fines and deleterious materials, organic impurities and light weight places in coarse and fine aggregate.

- (d) Workability tests on concrete by means of slump cone.
- (e) Determination of the crushing strength, absorption and efflorescence of bricks.
- (f) Concrete cube crushing strength at 7 days and 28 days.
- (g) Determination of flakiness index and crushing value for coarse aggregates.

The above tests (a) to (g) inclusive, shall be done on a routine basis as per the provisions of the relevant Indian Standards, or as specified by PMC and explanatory notes shall be kept during the construction period. The following additional tests of materials and workmanship shall also be carried out at Bidder's cost, if the Engineer-in-Charge or his representative requires:

- (h) Chemical tests of fine and coarse aggregates, to determine the sulphate, chlorides and other deleterious material present in the aggregate.
- (i) Testing of cement (Physical and Chemical), as per IS 269 or IS 485, as the case may be.
- (j) Tests on steel (Mild and High Tensile (Tor) as per IS 1786 to establish the Ultimate tensile strength, yield stress, percentage elongation and chemical composition.
- (k) Tests for suitability of water for concrete work.

In addition to the above tests, the Engineer In Charge or his representative, may request any other test to be carried out from time to time as per the Indian Standards or the Rajasthan PWD specification, at Bidder's cost.

Concrete

During the progress of construction sampling, preparation of test specimens, curing and testing of concrete shall be conducted in accordance with IS 1199 and IS 516, to determine whether the concrete being produced complies with the strength requirements as specified.

At least one slump test shall be carried out for every compressive strength test carried out, or as directed by the Engineer in Charge. Six numbers 15 cm cubes shall be made for each cubic meter or portion thereof or for each pour per grade of concrete. This number may be increased at the discretion of the Engineer-in-Charge. Six specimens shall preferably be prepared from different batches, three being tested after 7 days and the remaining three being tested at 28 days. The Bidder shall provide, at his own expense, all apparatus, labour and arrange for testing at a laboratory, approved by the Engineer in Charge.

The concrete tested in accordance with "Testing of Concrete" clause above, shall be the criteria for acceptance of concrete as per IS 456. The strength of concrete shall be the average strength of three specimens tested at 28 days and conform to strength requirements for different grades of concrete. If the advance 7 days tests show crushing strengths that are too low, corrective measures shall be taken at once, at the Engineer's direction, without waiting for the results of the 28 days tests.

Failure to Meet Strength Requirements

In cases where concrete tested fails to meet the test requirements, the Engineer-in-Charge shall have the right to require any one or all the following additional tests. These shall be carried out by Bidder at his own expense. The Engineer-in-Charge shall be the finally authority for interpreting the results and shall decide upon the acceptance or otherwise.

- ✓ Curing and load testing of the concrete member concerned represented by the test which failed.
- ✓ Replacement of any such portions of the structure. No payment shall be made for the dismantling of the concrete, relevant form work, or reinforcement. Embedded fixtures and reinforcement of adjoining structures damaged during dismantling shall be made good by the Bidder at his own expense.
- ✓ Extended curing of the structure of the concrete represented by the specimen.
- ✓ Collecting and testing of a core specimen from the hardened concrete. The location number and size of such specimen shall be taken as directed by the Engineer-in-Charge.
- ✓ Any Other tests i.e. ultrasonic/ or rebound hammer tests to be decided by the Engineer-in-Charge, at the Bidders own cost.

Check of Reinforcement and Concreting

All reinforcement shall be got checked recorded prior to pouring of concrete, by a representative of the Engineer-in-Charge. Similarly, the entire concrete pouring work shall be done in the presence of an officer not below the rank of Junior Engineer or support engineer from the consultant. The Bidder shall therefore, give a notice of a minimum three days to the Engineer-in-Charge or his representatives, such that the work can be checked by him or his representative. No work shall be covered before inspection and approval of Engineer-in-Charge.

Minimum Requirement for all reinforced or plain concrete structures

Cement concrete (plain or reinforced) shall comply with the requirement of specifications of Rajasthan PWD (B&R) Specification and Explanatory Notes for Buildings and House Drainage except in so far as these are not altered or modified by specific stipulations as given in the specifications herein. The concrete grades to be used shall not be leaner than following:

Water bearing structure	M30
Other structural concrete	M25
Lean concrete in foundation	M15

- a) Minimum cement content of 360 kg/m³ with maximum 20mm size downgraded coarse aggregates for M 25 grade concrete, whereas design mix has to be carried out for M25 and above grade.

- b) Approved quality water proofing compound (chloride free) shall be added during concreting of all water retaining structure, in the proportion specified by the manufacturer/as per design mix or up to 2% (percent) by weight of cement.
- c) To check the fine cracks, fiber should be used as secondary reinforcement in the RCC as per manufacturer recommendation for water retaining members only.

Precautions to Keep Service Reservoir Free From Contamination

As soon as possible after completion of reservoir and after all pipes have been laid the Bidder shall remove all dirt, debris, materials, tools etc. from the reservoir and shall wash and brush down with water the whole of the interior. He shall also if required by the Engineer incorporate a mixture of chloride of lime in the water wash required.

The greatest care shall be taken to keep the entire reservoir free from any contamination. Strict supervision shall be maintained over the workmen entering after first washing down. Provision shall be made to enable workmen to wash their feet or footwear clean and sterilize them before entering.

Construction joints

As construction joints are weak in shear normally construction joints, if required, shall be provided in location where shear stress is minimum. However, construction joints should be avoided in the bottom slab of any water retaining structure. In the walls of the water retaining structures vertical construction joints should be avoided to the maximum possible extent. In the event the Bidder solely for his convenience proposes construction joints in the bottom slab and or vertical construction joints in the wall of the water retaining structures, then the Bidder shall provide approved PVC water-stop of 230mm width and 8 mm thick in all such joints. For the convenience of construction and to avoid segregation of concrete horizontal construction joints shall be provided in a planned way at a height not more than 2.0M in case of approved admixture, at his cost, is used by the Bidder in the concrete to increasing the workability of the concrete without affecting the designed water cement ratio. In case such admixture is not used the height of such cast shall be restricted maximum up to 1.5M.

All such construction joints should be prepared properly like removing of all loose materials by wire brush and soaking with rich cement slurry mixed with approved water-proofing compound in prescribed ratio, before pouring next concrete. Next pour of concrete in any construction joints in water retaining structures should be within 24 hours of last pour.

Final Finishing

The Bidder shall ensure that the entire structures along with all its installations are in a finished and in new and fully operative condition when handed over. He shall have repaired and remove all signs of damage that might have been done during the course of installation and fixing of equipment. He shall also see that the entire exterior finished

properly and the entire site is cleared all extra construction material, debris and excavated soil. This shall have to be done to the satisfaction of Engineer-in-Charge.

Pipes and Specials

The CI double flanged Pipes shall conform to IS-7181 / IS-1536 and CI double flanged fitting specials shall be in accordance with IS-1538.

Sizes of different pipes for inlet, Outlet, Overflow and wash out pipes for different locations shall be as per scope of work or GA drawing for ESRs & CWRs:

CI Double flanged Dismantling joints shall be installed in such a manner that valves can be dismantled without stress to the joints. These shall be for minimum working pressures of 10 kg/cm² (1 Mpa) and shall be completely leak proof with proper gasket arrangement. Flange dimensions shall conform to latest relevant IS code. Flanged specials shall be supplied with required nuts, bolts and rubber gaskets. The dismantling joint shall be internally and externally coated with hot applied (dip) bituminous paint.

All flanged Specials

The cast iron flanged specials (all flanged tee, flanged tapers, bends, blank flanges. Puddle collar) shall conform to IS 1538.

The specials shall be internally and externally coated with hot applied (dip) bituminous paint.

All flanged specials shall be used for nominal pressure of 25 kg/cm².

Flanged specials shall be supplied with the galvanised bolts, nuts and rubber gaskets. The galvanised nut & bolts shall be supplied in jute bag; rubber gasket shall be supplied in polyethylene bags. The rubber gaskets shall conform to IS 5382.

The length and size of the puddle collars to be fixed at different places of the structures shall be decided by the Engineer in Charge.

Puddle Collar

All puddle collars shall be of DI. The length and size of the puddle collars shall be as per specifications of tender.

Ladder

M. S. step ladder 450 mm wide, made up of 50mm x 50mm x 6 mm M.S. angle iron and steps of suitable width and thickness (as approved by EiC) at 300mm c/c shall be provided outside from the balcony to top dome. MS cage shall also be provided on this ladder as shown in drawing. The ladder from top dome to inside platform and from platform to button dome in the container shall be of aluminum. Its drawing shall be got approved from EIC before dispatch.

Railing

Hand railing around the platforms, Balcony, stairs and landings shall be consisting of 25mm diameter medium B class GI pipes in two rows (one at the top and other at middle level) and 1000mm high vertical post 65x65x6 mm angle iron @ 1500mm center to center (At least two vertical angles are to be provided wherever distance is less) with all accessories like elbows, tees etc. including welding, threading and embedding in cement concrete floor. Railing shall be protected against corrosion after welding. The pipe shall pass through hole in the vertical angle.

Mechanical Float Water level Indicator:-

Water level indicator consists of an approved copper float and iron counter weight and connected by 4 mm thick steel flexible stranded wire passing over aluminum pulleys 7 cm diameter fixed on GI medium class pipe which is installed as indicated in the drawing shall have to be provided. The scale shall be calibrated in centimeters and should consist of MS sheet 20 gauge fixed over wooden plank with an MS angle iron frame of 35 mm X 35 mm X 5 mm and painted with white enamel bases, letters in black and red. The scale shall be located and fixed with RCC column at 2.3 m above the ground for Service Reservoir.

For Ground Level Clear Water Reservoir the water level indicator will be fixed on outer portion of vertical wall as directed by Engineer.

Ventilator

A ventilator, as shown in the drawings, fixed with 24 gauge square mesh of 14 gauge SS wire around the circumference.

Lightening arrester

Lighting arrester shall be of copper bar of 25mm dia and 2m. long to be provided at the top of ESR. This is to be connected by a GI strip of 25 mm wide & 3mm thick. This conductor strip shall be connected to a 450mm x 450mm x 3mm thick copper plate to be embedded below the average ground level. The earthing system shall comply with Indian Electricity Rules and shall confirm to IS 3043. The pit shall be refilled by alternate layers of salt and coke as shown in the drawing and balance shall be filled with loose soil. The 40 mm dia GI watering pipe shall be provided in the pit. Care shall be taken that earth pit does not sink.

Painting

If not otherwise stated metallic surfaces shall receive one initial coat at the manufacturer's workshop. After arrival of the equipment on site, the same shall be inspected and damaged portions shall be cleaned and given the primer and under coat of similar paint. After erection all metal work shall be painted as follows:

Painting of metallic surfaces

All mild steel railing, gate, frame, MS ladders, ventilator, manholes, cover, float valves shall receive a coat of primer of red oxide, two under coats and one finishing coat of an approved enamel paint and of approved shades.

Plinth Protection

Plinth protection works are to be constructed below the Elevated Service Reservoir, it shall be extended up to 1m from fall of balcony or edge of raft slab, whichever is more all around elevated service reservoir and 1.0 m from the foundation raft outer edge of partly underground CWR. It shall consist of laying lean concrete 150 mm thick in M15, over compacted soil.

The minimum free space between plinth protection and the first bracing of the ESR shall be 1.60 m.

Pipe Clamp

The clamp shall be 6mm thick 550mm wide MS flat fixed on pipe & column as shown in drawing.

Man Hole Cover

Square man hole cover 800x800 mm shall be provided. The cover shall be made of 3 mm thick MS flat. The frame shall be made of MS angle 80*80*4. The cover shall be connected to this frame by using two nos. strung hinges. Arrangement shall be provided as shown in drawings.

Testing for water tightness (REPRODUCED from IS 370)

The Bidder shall carry out a water tightness test for the maximum water head condition i.e. with the water standing at full supply level. All cost of testing shall be born by the Bidder. This test shall be carried out in accordance with the procedure given below:

For water tightness test, before the filling operations are started, the reservoirs shall be jointly inspected by the Engineer In Charge and the representative of the Bidder and condition of surfaces of wall, construction joints etc. shall be inspected and noted and it shall be ensured that jointing material filled in the joints is in position and all openings are closed. The Bidder shall make necessary arrangement for ventilation and lighting of reservoir by way of floodlights, circulators etc. for carrying out proper inspection of surface and internal conditions if so desired by the Engineer in Charge.

The water retaining structures shall be filled with water gradually at the rate not exceeding 30 cm. Rise in water level per hour and shall extend for a period of 72 hours. Records of leakages starting at different level of water in the reservoirs, if any, shall be kept.

The reservoirs once filled shall be allowed to remain filled for a period of 7 days before any readings or drop in water level is recorded again at 7 days. The total drop in surface level over a period of 7 days shall be taken as indication of the water tightness of the reservoir, which for all practical purposes shall not exceed 40mm. There shall be no indication of leakages around the puddle collars or on the wall and bottom of the reservoir.

If the structure does not satisfy the test requirements, and the daily drop in water level is decreasing, the period of test may be extended for a further seven days and if the specified limit is not exceeded, the structure may be considered as satisfactory.

In case the drop in water level exceed the permissible limit with the stipulated period of test, the Bidder shall carry out such additional works and adopt such measures as may be directed by the Engineer In Charge to reduce the leakage in the permissible limit. The entire rectification work that shall be carried out in this connection shall be at Bidder's cost.

If the test results are unsatisfactory, the Bidder shall ascertain the cause and make all necessary repairs and repeat the water retaining structure test procedures, at his own cost. Should the re-test results still be unsatisfactory after the repairs, the structure will be condemned and the Bidder will dismantle and reconstruct the structure, to the original specification, at his own cost.

Design Considerations:

Design Submissions

The Bidder shall be responsible for the safety of structures, correctness of design and drawings, even after the approval of the same by Engineer-in-Charge. Complete detailed design calculations of foundations and superstructure together with general arrangement drawings and explanatory sketches of reservoir shall be submitted to the Engineer-in-charge for approval. Separate calculations for foundations or superstructures submitted independent of each other shall be deemed to be incomplete and will not be accepted by the Engineer-in-charge.

The design considerations described hereunder establish the minimum basic requirements of plain and reinforced concrete structures, masonry structures and structural steel works. However, any particular structure shall be designed for the satisfactory performance of the functions for which the same is being constructed.

Design Standards

All designs shall be based on the latest Indian Standard (I.S.) Specifications or Codes of Practice unless otherwise specified. The design standards adopted shall follow the best modern engineering practice in the field based on any other international standard or specialist literature subject to such standard reference or extract of such literature in the English language being supplied to and approved by the Engineer-in-charge. In case of any variation or contradiction between the provisions of the I.S. Standards or Codes and the specifications given along with the submitted tender document, the provision given in this specification shall be followed.

Design Life

The design life of all structures and buildings shall be 60 years.

Design Loading

The structure shall be designed to resist the worst combination of the following loads/stresses under test and working conditions; these include dead load, live load, wind load, seismic load, stresses due to temperature changes, shrinkage and creep in materials, dynamic loads:

Dead Load

This shall comprise all permanent construction including walls, floors, roofs, partitions, stairways, fixed service equipments and other items of machinery. In estimating the loads of process equipment all fixtures and attached piping shall be included.

Live Load

Live loads shall be in general as per I.S. 875. However, the following minimum loads shall be considered in the design of structures:

- i) Live load on roofs : 4.00 KN/m²
- ii) Live load on all other floors walkways, stairways and platforms : 2.00 KN/m²

In the absence of any suitable provisions for live loads in I.S. Codes or as given above for any particular type of floor or structure, assumptions made must receive the approval of the Engineer-in-charge prior to starting the design work. Apart from the specified live loads or any other load due to material stored, any other equipment load or possible overloading during maintenance or erection/ construction shall be considered and shall be partial or full whichever causes the most critical condition.

Wind Load

Wind loads shall be as per I.S. 875. Part 3. The risk coefficient should be for important structure. Similarly terrain considered as few or no obstruction.

Earthquake Load

This shall be computed as per I.S. 1893 taking into consideration soil foundation system, importance factor appropriate to the type of structure basic horizontal seismic coefficient/ seismic zone factor & average acceleration coefficient. The zone for earth quake consideration shall be zone 3. If in the district , more than one zones have been specified in the new earthquake BIS code, the severest zone has to be considered for the analysis.

Joints

Movement joints such as expansion joints, complete contraction joints, partial contraction joints and sliding joints shall be designed to suit the structure.

No expansion joints in wall, floor & roof of water retaining structure shall be allowed.

The positions of construction joints should be specified by the designer & indicated on the drawings. If there is a need on site to revise any specified position or to have additional joints, the proposed positions should be agreed with the designer.

The concrete at the joint should be bounded with that subsequently placed against it, without provision for relative movement between the two concrete should not be allowed to run to a feather edge & vertical joints should be formed against stop edges.

Foundations

The minimum depth of foundations for the structures, frame foundations and load bearing walls shall be as per IS 1904 and suitable for site. Bearing capacity of soil shall be determined as per IS: 6403.

Care shall be taken to avoid the foundations of adjacent buildings or structure foundations, either existing or not within the scope of this contract. Suitable adjustments in depth, location and sizes may have to be made depending on site conditions. No extra claims for such adjustments shall be accepted.

A structure subjected to groundwater pressure shall be designed to resist floatation. The dead weight of empty structure shall provide a factor of safety of 1.2 against uplift during construction and service.

Where there is level difference between the natural ground level and the foundations of structure or floor slabs, this difference shall be filled up in the following ways.

In case of liquid retaining structures, the natural topsoil shall be removed as described above and the level difference shall be made up with Plain Cement Concrete not weaker than M 10.

All blinding and leveling concrete shall be a minimum 100 mm thick in concrete grade M15 unless otherwise specified.

Minimum Thickness Requirements of members:

The following minimum thickness shall be used for different reinforced concrete members, irrespective of design thickness. The raft thickness of CWR should be higher than the bottom thickness of wall.

(i)	Walls for liquid retaining structures(treated Water)	
	For OHSR –	: 150 mm
	For CWR -	: 200 mm
(ii)	Roof slabs for liquid retaining structures (other than flat slabs)	: 150 mm
(iii)	Bottom slabs including roof slabs for liquid retaining structures	: 200 mm
(iv)	Floor slabs including roof slabs, walkways, canopy slabs	: 100 mm
(v)	Wall of cables/ pipe trenches, underground pits etc.	: 150 mm
(vi)	Column footings	: 300 mm
(vii)	Parapets, Chhajja	: 100 mm
(viii)	Pre-Cast trench cover	: 75 mm

SUB SECTION:-4

OPERATION AND MAINTENANCE MANUAL AND AS-BUILT DRAWINGS

The submission of the As-built drawings and the operation and maintenance manual for the system is the precondition for the final payment.

1. OPERATION AND MAINTENANCE MANUAL

The Bidder has to submit as operation and maintenance manual (SEPARATE FOR STP's after the physical completion of the work. This manual will be submitted as draft at the date of physical completion and as final version one month after commissioning. It shall include all the experience made during the tests and the training given to the operators during the commissioning period. The Bidder will prepare this manual in cooperation with his suppliers and subBidders and after consultation with the Procuring Entity's representative for detailed contents. It will at least contain the following items.

General description of the plant /PS and their functioning.

Step- by step procures for plant functioning.

Architectural, mechanical electrical, instrumentation, piping drawings, sections, details, charts.

Nomenclature of all the equipment (mechanical, electrical, instrumentation, power and signal cables, electrical and sanitary fixtures)

- For each item of the equipment
- Drawing charts (if required)
- Operational Instructions
- Calibration charts (if required)
- Fault identification and location guides and charts
- Repair instructions (if repair by operations if possible)
- Maintenance instructions including type and quantity of lubricants
- Spare parts list with addresses of suppliers and procedures for ordering.
- Preventive maintenance schedules for all the equipment, showing the type and frequency of maintenance of different items
- Type and quantity of the recommended consumables (lubricants, fuels etc.,)
- Emergency management for specimen emergency situation which might occur due to external or internal factors
- Logs for the operator of the system
- Operating hours
- Salient indicators of the operation
- Maintenance operations
- Fault and actions taken
- Other events

Address and telephone number to contact in case of operation problems shall be provided.

It is emphasized that a collection of standard literature of a general nature, unaccompanied by specific drawings and descriptive matter relating to the work as commissioned, shall not be acceptable.

The operation and maintenance manual shall be bound in one or several loose-leaf binders designed to prevent loss and damage of the contents. The binders shall be tilled, numbered, and have a table of contents of all information contained.

2. AS – BUILT DRAWING

The Bidder shall submit to the Procuring Entity's representative within one months of actual completion, "Completion" Drawings as specified below. These Drawings shall be accurate and correct in all respects and shall be shown to and by the Procuring Entity's representative.

Completion Drawings as specified below on shall be supplied by the Bidder two prints and one polyester film, along with a soft copy in CD. These drawings shall be developed in Auto CAD recent version. Drawings shall be of standards size described below.

- 2.1 Site plan showing all features existing and as constructed under this contract with all external dimensions of clear spaces among those, diameter and materials of pipeline etc. complete.
- 2.2 Architectural, civil and structural details of all components of the Plant, including plans at different levels, elevations from all sides as well as sections etc. complete with all dimensions including structural thickness, concrete grade, reinforcement details, finishing details, schedules of doors and windows, details of associated fittings and features complete.
- 2.3 All piping, plumbing and electrical details with dimensions, diameters etc. complete. At specific cases isometric views of piping may be necessary.
- 2.4 Dimensional details of all electrical, mechanical and instrumentation equipments including accessories along with arrangement inside the buildings or enclosures, connected piping and cabling, layout, etc. all complete.
- 2.5 Dimensional details of all control and measuring devices lined weirs, V-notches, probes, valves, gates, consoles, panels, switch boards, cable layout etc. for the complete Plant. Fine diagrams and circuit diagrams shall be used wherever applicable.
- 2.6 L-Section for pipelines laid externally, showing pipe profile, ground profile, soil condition, bedding location of specials, valves, and other accessories complete.
- 2.7 Dimension details of all site development works such as roads, drainage, cables, pipelines, landscaping, etc. complete with layout, cross sections, levels, etc. complete.

All drawings shall be prepared in appropriate scale and with adequate notes, legends, titles, etc. for clarity.

Sub Section 5 – Operation under HAM

1. General Requirements for Operation (For each STP's)

The Bidder shall operate and maintain the entire Plant for a total operation period of 15 years from the date of completion of Trial period. All necessary repairs, maintenance, overhaul, replacements etc., shall be made during the operation period to maintain the Plant at the status of formal handing over after the commissioning. At the end of operation period the plant shall be handed over to the Procuring Entity in fully functional and new condition except normal wear and tear.

The Annuity paid for operation period bill shall include, supply of all tools, tackles, spares, lubricants, laboratory chemical, glassware and polyelectrolyte. The scope shall include but not limited to the following items.

- Operation and Maintenance including Civil, Electrical, Mechanical and all allied works
- Sampling and testing of influent sewage based on the tests and frequency desired by the Procuring Entity's representative and in general in accordance with the CPHEEO manual on Sewerage and Sewage Treatment.
- Sampling and testing of additional samples for the day to day O & M of the STP and as mutually agreed from time to time between the Bidder and the Procuring Entity's representative.
- Sampling of final treated effluent to ensure that the guarantee parameters are as stipulated in the bid document. The sampling frequency to be as per relevant norms of Rajasthan Pollution Control Board or higher as decided by Procuring Entity's representative. The Procuring Entity reserves right to collect samples at random at the will of the Procuring Entity through any agency nominated by him. Procuring Entity shall have right to seek part of sample collected by the Bidder without any prior intimation to cross check the results on random basis. However the analysis charges of such samples shall be borne by Procuring Entity.
- O & M of all functional and utility buildings, infrastructure and common areas Within the Plant campus.
- Proper maintenance of Water Supply, Sewerage, Roads, Paths, lawns including trimming and upkeep of gardens etc.,
- Maintenance of Proper records of sampling as per approved Performa.
- Loading, Unloading and Transportation of screenings, Wet sludge and wet grit out of treatment Plant site at his cost as directed by Procuring Entity's representative within 20 km from the Plant at the place as directed by the Procuring Entity's representative from time to time. The wet sludge shall be collected and disposed of by the Bidder. Any revenue accruals by sale of sludge shall be to the benefit of the Bidder.
- Maintenance of log books of all the machinery not connected to the PLC / SCDA shall be done separately & collectively, at the STP fortnightly and monthly reports of all such machinery and parameters monitored by the PLC shall be generated and hardcopy along with soft copy shall be got approved by the Procuring Entity's representative. These reports shall contain sufficient appropriate and adequate data to make the records meaningful and amenable to analysis for evaluating the performance of the Plant as well as to help in O & M decisions.
- Security of the campus and contents therein shall be Bidder's responsibility.
- The records maintained by the Bidder shall be produced periodically to the Procuring Entity's representative for proper monitoring. The Procuring Entity's

representative's remarks shall be attended to on next submission. Consolidated summary reports shall be furnished to the Procuring Entity monthly, quarterly and yearly containing salient features.

The Bidder shall also maintain history sheets of overhauling, maintenance, replacement of all the important electrical and mechanical equipment

The O & M shall include the appropriate preventive maintenance of equipment as per the manufacturer's recommendation.

The operation, maintenance and repairs services shall be performed according to the following.

Down time:

The Plant shall never be operated at less than 50% of its design capacity due to maintenance and repair reasons. The period of such exceptional operation shall not exceed two consecutive days and shall not be more than three days a week. The maximum downtime of the whole Plant shall not exceed 8 hours. The periods for repairs and maintenance have to be communicated to the Procuring Entity's representative at least one month in advance. For machinery and equipment which requires maintenance to be carried out by manufacturer/ manufacturer's authorized representative, the down time shall not exceed 30 days. Procuring Entity reserves the right to impose penalty, should there be any default by Bidder on this account.

Operation of the Plant as per O & M Manual:

The Plant shall be operated according to the rules and procedures laid down in the O & M manual. The Plant must be in position to work at the design capacity at any time.

Awareness & Cleanliness

The Bidder and his staff shall maintain a high degree of awareness in operation and maintenance of the Plant and all relevant safety codes and procedures. At all times the Plant, its equipment and surrounds shall be kept clean and in order' including the buildings, floors, walls, roofs, windows, and garden etc.

Frequency of Preventive maintenance

The preventive maintenance shall be carried out according to the preventive maintenance schedule of the Plant. The regular staff may be reinforced with short-term specialists by the Bidder for special maintenance tasks, after duly informing the Procuring Entity's representative of the need and the schedule.

Repairs

Repairs shall be made as and when needed very promptly on the spot or at the Bidder's / Manufacturer's workshop. The need of repair on the spot or at the Bidder's workshop has to be defined in co-ordination with the Procuring Entity's representative and according to the status of spare parts availability.

Spare parts

The Bidder shall keep a reasonable stock of spare parts so that the down time of equipment can be kept within the limits specified. The contents of the stock and the reorder level of the inventory have to be approved by the Procuring Entity's representative.

Transportation

All necessary transportation shall be arranged and made by the Bidder at his own expense.

Consumables

The Bidder has to ensure that there is always sufficient stock of 15 days of consumables, laboratory chemical, Chemical for H₂S scrubbing (if provided), glass ware etc.,

Chemicals

The Bidder has to ensure that there is always minimum stock of 30 days requirement of Polyelectrolyte.

2 GENERAL OBLIGATION

The Bidder shall operate and maintain the all STP,s under this contract for the period specified in this contract which shall be extendable for a further period of five years at the Procuring Entity's option.

The Bidder will submit a detailed operation and maintenance plan for approval of Procuring Entity's representative. All operation and maintenance activities shall be carried out strictly in accordance with the approved plan.

The services shall include but not be limited to the following items.

- a) Operation and maintenance of the sewage treatment plant from the inlet chamber up to disposal point.,
- b) Training for the O & M staff of designated by Procuring Entity's requirement.
- c) Generation and maintenance of periodic reports.
- d) O & M and up keeping the CCTV system installed under contract at STP,s

3 OPERATION

3.1 Operational services

The Bidder shall operate the complete sewage treatment Plant and associated services on a continuous 24-hour basis.

The Bidder shall operate and utilize the control and monitoring systems provided. If found necessary, he shall make adjustments (within the operation range) of the control system and equipment, so that the Plant operation matches the treatment process requirements.

If it is determined that the facility is not capable of meeting the design parameters for any reason beyond the Bidder's control and not attributable to him, the Bidder shall determine the specific cause of failure/ abnormality in the Plant functioning and report to the Procuring Entity's representative and seek his directives on the necessary corrective action to be taken/adopted.

The Bidder will be required to furnish the details of electricity consumption in the format prescribed by the Procuring Entity's representative.

All consumables, Polyelectrolyte, and spare required operating and maintaining the Bidder shall provide the Plant in good condition. The grit, Screenings, Wet sludge and other garbage generated in the plant shall be removed from the site on daily basis. No accumulation of such residues shall be permitted within the Plant campus without express application by Bidder giving adequate reasons as well as permission of Procuring Entity's representative. The Bidder shall such residues in conformity to Environmental regulations/ rules in force. The Procuring Entity's Representative may, if required, decide the mode and timing of disposal of such residues in consultation with concerned Environmental and Civic Authorities. Such directions shall be followed by the Bidder promptly, both in letter and spirit, without any reservations and without any increase in O&M /other costs. The loading, unloading and transportation cost of these shall be borne by the Bidder and shall be included in the price quoted by the Bidder for O&M.

The Bidder at his own expense shall provide all tools, cleaning, and housekeeping equipment, security and safety equipment

3.2 Laboratory services

- a) The Bidder shall perform all tests, sampling and analyses regularly as approved by the Procuring Entity's requirement and as per the O & M standards
- b) The Bidder will submit in his offer a complete list of laboratory equipment and materials in accordance with the analysis program required, if in addition to the mandatory list of laboratory equipment.

3.3 Manpower

The Bidder shall provide experienced managerial, technical, supervisory, laboratory, administrative, and non-technical personnel and labour necessary to operate and maintain the treatment Plant(separate to all STPs) and works properly, safely and efficiently on a continuous 24 hour basis for the full term of the O & M period. While doing so due consideration shall be given to the labour laws in force.

The qualification and capability of Bidder's personnel shall be appropriate for the tasks they are assigned to perform. The staff provided shall be fully trained in the operation of the works before being given responsibility. If, in opinion of the Procuring Entity's representative, a member of Bidder's staff is considered to be insufficiently skilled or otherwise inappropriate for the assigned task, and Procuring Entity's representative informs the Bidder in writing, the Bidder shall replace him with a person of appropriate skills and experience for the task, approved by the Procuring Entity's representative, within one month of being so informed.

The bidder shall propose in his tender a staff management structure for the operation and maintenance of works. The suggested structure (minimum) shall be as follows (For each STPs under contract):

S. No.	Category of employee	Number of employees
(i)	Fitter / Electrician / overall in-charge	1 (for town)
(ii)	Pump Driver/technician	3 (each STP)
(iii)	Lab Assistant	1 (each STP)
(iv)	Labour	3 (each STP)
(v)	Sec. Guard	3 (each STP)

The Procuring Entity may require a suitable change in the structure on the basis of design, automation and other relevant parameters it deems fit.

The Bidder shall provide all secretarial support, printing and publishing services, office furniture and office supplies as required. It shall also ensure that all labor welfare laws and regulations are followed, including weekly rests, rotation of duties

The C V resumes of the Bidder personnel shall be submitted to the Procuring Entity's representative for acceptance at least two months before anticipated commencement of the pre-commissioning of test. Normal time duty hours for the Bidder's O & M personnel may be modified as necessary and agreed by the Procuring Entity's representative. A rotating shift schedule shall be established by the Bidder and approved by the Procuring Entity's representative who will ensure

that an adequate number of the Bidder's staff will be available for duty at Plant 24 hours each day, 7 days week, including national holidays.

In the event that it is necessary for more than one of the Bidder's O & M personnel to be absent from the Plant, for whatever reason, the Bidder shall provide a qualified replacement at his own expense and ensure that specified project duty coverage is maintained. If substitute key personnel are required for a period longer than 15 days, their CV must be approved in advance by the Procuring Entity's representative.

The O & M personnel shall be dedicated solely to the specified duties and responsibilities and shall not be diverted to perform Bidder's administrative duties, construction arrangement, office management, or other non- O & M activities. Adequate support staff shall be provided by the Bidder in order to avoid any such diversion.

The bidder shall provide justification of the labour cost proposed by him for all personnel

The Bidder shall include in his cost medical and accident insurance expenses of all the staff employed by him along with all provisions of the labour welfare acts prescribed from time to time by the State and Central Government. Adequate insurance cover shall also be maintained during O & M period for all short-term employees, as well as casual, temporary employees and visitors.

Procuring Entity is not liable for any situation arising due to any accident/mishap of whatever nature occurring in the Plant premises.

3.4 Safety

The Bidder shall be responsible for safety of his staff during O & M of the Plant and shall procure, provide and maintain all safety equipment necessary for satisfactory O & M such as gas masks, gloves, boots, mats etc.,

1. The Bidder shall utilize safety awareness procedures in every element of operation and maintenance.
2. The Bidder shall emphasize site safety including adoption of
 - (a) Safe working procedures
 - (b) Cleanliness and care of the plant as a whole
 - (c) Accident and hazardous conditions prevention and reporting.
 - (d) Safe practice while working near digester / gas holder areas

The Bidder shall impart safety training to all members at regular intervals, especially for new comers.

The Bidder shall provide Notice boards and display boards at appropriate locations detailing precautions to be taken by O & M personnel to work in conformity to regulations and procedures and by the visitors to the Plant.

The Bidder shall notify the Procuring Entity's representative immediately if any accident occurs whether on-site or off site in which Bidder is directly involved and results in any injury to any person, whether directly concerned with the site or a third party. Such initial notification may be verbal and shall be followed by a comprehensive report within 24 hours of the accident.

3.5 Reporting

The Bidder shall prepare consolidated daily reports, weekly and monthly reports on Plant operation and maintenance and submit to the Procuring Entity's representative. The daily reports are to be submitted within first working hour of the next day. The monthly reports shall be submitted on the first day of the next month and within two working hours with CCTV monthly data back up to EIC.

Overall reporting formats shall be approved by Procuring Entity's representative and may have to be modified from time to time as required and approved by Procuring Entity's representative. Bidder may have to prepare and submit additional reports on particular matters and incidents as and when required by the Procuring Entity's representative for each significant occurrence.

4 MAINTENANCE

4.1 Maintenance of all Installed Plants

The Bidder shall ensure the continuity of all the Plant operations and the breakdown or the deterioration in performance of the Plant under normal operating conditions of any items of the Plant and equipment and component parts thereof shall be minimized.

The classes of maintenance provided shall comprise full Operational maintenance and standby Maintenance.

Full operational maintenance comprises the planned and regular maintenance carried out by the Bidder on a day-to-day basis, including cleaning, lubricating, minor adjustment, together with the preventive and corrective maintenance plan for those items of the Plant and equipment within the treatment works which have been commissioned and made operational.

Standby maintenance comprises the planned and regular maintenance carried out by the Bidder including cleaning, lubricating, periodic, and minor adjustment of all items of Plant and equipment within the treatment works which have been installed but have not yet been made operational.

The Bidder shall carry out the maintenance of the Plant installations in accordance with the requirements of the O & M Manual and to the approved maintenance plan. The Bidder shall strictly adhere to the manufacturers' recommendations with respect to equipment maintenance, and only use types and grades of lubricants to be used. The frequency of lubrication, adjustments to be made regularly, and recommended spare parts by the equipment/machine/instrument manufacturer/supplier shall be carried out and appropriate inventory shall be held in store.

4.2 Building and Site Maintenance

The Bidder shall be responsible for:

- The full maintenance of building and all electrical, ventilation, plumbing and drainage installation in the building.
- Building and housekeeping maintenance.
- Full maintenance of the site water and wastewater services, cabling and earthing systems, and the site road lighting system.
- Site maintenance including the upkeep of landscaped areas/ tree Plantation etc.,
- The telephone installations in all buildings.
- CCTV system installed in Campus

The building services and housekeeping maintenance shall be undertaken on all buildings and services installations.

Routine housekeeping maintenance shall be carried out in accordance with procedures specified in the Operation and Maintenance Manual which shall be approved by the Procuring Entity's representative.

4.3 Preventive Maintenance

The Bidder shall plan the day-to-day and the preventive maintenance. This planning must include for each equipment the estimated necessary hours in preventive maintenance and break down maintenance. It shall also include the qualification of the foreseen maintenance personnel.

The Bidder shall provide the yearly requirement of spare parts and consumable needed for the maintenance of each piece of equipment for the day-to-day maintenance, preventive maintenance, and foreseen break down maintenance/overhaul, if any.

5. TRAINING

5.1 General

- (a) The Bidder shall be responsible for instruction and training of all his personnel in all aspects of Plant operation and maintenance till the end of the operation and maintenance period. The Bidder shall also be responsible for training personnel designed by the Procuring Entity who will operate the Plant at the expiry of the contract.

The Bidder will make available for this purpose competent staff and as well as propose schedule information that may be necessary for effective execution of the training programs.

The training shall be organized in two (2) stages as follows:

- Basic technical training education to be carried out during the final stages of the erection period of the contract through literature, manuals, handouts demonstration at site, etc.
 - Intensive on-the- job training during commissioning and maintenance period.
- (b) By the end of this training period these personnel should be able to carry out their respective duties efficiently under the supervision of Procuring Entity's representatives and supervisory staff of the Procuring Entity.

The Bidder shall provide at his cost all local transportation, literature, computers, CDs and other related hardware and stationery to be used by trainers and trainees during the training period.

- (c) Towards end of O & M contract period, training shall be conducted once again to Procuring Entity's personnel or their authorized personnel. This training shall be for duration of 30 working days.

6. OPERATION AND MAINTENANCE RECORDS

The following are a typical sample form of records (not an exhaustive and comprehensive) that are required to be maintained by the O & M Bidder. The details of complete records shall be prepared and submitted by the O & M Bidder to the Procuring Entity's representative for approval prior to commissioning.

6.1. PERFORMANCE DATA OF SECONDARY TREATMENT UNITS.

The performance data sheet shall contain the records of the analytical results at the inlet and outlet all the parameters. These parameters are pH, Dissolved Oxygen, BOD & COD, TSS, VSS, N, P, Sulphate and Temperature.

Month:

Year:

Date	Name of Treatment					Chlorination				Centrifuge						Officer on duty	Operator
	a	b	c	d	e	a	b	c	d	d	f	g	h	i	j		

a- BOD

b – COD

c- Suspended solids/ MLSS

d-pH

e - Dissolved oxygen

f – VSS content

g –solid concentration in the underflow

h- if any

i- total nitrogen

j- total phosphorus

h- coliform

6.2 Other Records

The Bidder shall maintain detailed record of consumption of Polyelectrolyte and other scrubbing chemicals (if used). Record of wet sludge transported out of the plant site shall be maintained. Similarly record of material movement shall also be maintained as appropriate and approved by Procuring Entity's Representative.

These records shall be available to the Procuring Entity's Representative for scrutiny and copies shall be furnished on demand. The data backup of CCTV system installed in each campus of STPs.

6.3 Overall performance of the Plant

The following non- statutory shall also be monitored for the purpose of establishing satisfactory performance of the Plant and the penalties shall be imposed on non-achievement of the same as per the table given below:

After the unit	Quality of the effluent	Penalty on non-achievement per day during O &M
Outlet Chamber (Treated Effluent)	BOD ₅ not more than design parameter mg/l. Suspended solids not more than design	Penalty imposed by RPCB/CPCB/RUDSICO on non achievement of the effluent quality standard shall be recovered from Bidder @

	parameter mg/l	two times of the penalty imposed
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SUBSECTION 6

STANDARD SPECIFICATIONS

Electrical and Instrumentation Works specification

1.0 General

The General Criteria followed for the equipment and systems is as given below.

Equipment

All the indoor electrical equipment shall be rated and sized for a 'design ambient temperature' of 45°C, while all the outdoor electrical equipment shall be rated and sized for a 'design ambient temperature' of 50°C.

The main LV switchboard and other DBs shall be with 'Form-4' enclosure as per the Indian Standards. All indoor boards/panels shall be with a degree of protection of IP 54, while all outdoor equipment shall be with a degree of protection of IP 55.

All LT power cables shall be 1100 V grade, PVC insulated, extruded inner and outer PVC sheathed, stranded aluminium conductored and armoured, while all control cables shall be 1100 V grade, PVC insulated, extruded inner and outer PVC sheathed, stranded copper conductored and armoured.

All the electrical equipment, accessories and systems shall conform to the latest editions of the Indian Standards or other equivalent international standards.

Cabling, Earthing and Lighting Systems

The cabling/earthing/ and lighting system shall get approved from Project Manager. Main earthing conductors outside and inside the building shall be planned in such a manner that all the equipment are connected to the earthing system by two connections in a reliable manner.

Protections

The following protections shall be provided on the LV switchboard/Sub-DB, as applicable.

- i. Thermal overload and short circuit protection features on MCCBs and MCBs for feeders
- ii. Thermal overload, locked rotor, short circuit, negative sequence and earth fault protection for main motor feeders
- iii. Overload protection by thermal (bimetal) relays with single phasing preventer (SPP) for contactors for other motor feeders

Metering

The following metering shall be provided on the main LV switchboard/Sub-DBs.

- i. Incomer
 - Ammeter with selector switch
 - Voltmeter with selector switch (only for main LV switchboard)
 - Kilowatt meter (only for main LV switchboard)

- Power factor meter (only for main LV switchboard)
- Kilowatt-hour meter (only for main LV switchboard)

ii. Outgoing Feeders of main LV Switchboard

Ammeter with selector switch on main motor feeders

iii. Indicating Lamps

The following indications will be provided on the LV switchboard/Sub-DB, as applicable.

- Incomer
- Supply 'ON' (Red, Yellow & Blue)
- Phase Motor Feeders
- Motor 'ON', 'OFF' & 'Trip' indications (Red, Green & Amber)

2.0 Transformers

General

The transformer tank shall be made from high-grade sheet steel, suitably reinforced by stiffeners made of structural steel sections. All seams, flanges, lifting lugs, braces, and other parts attached to the tank shall be welded. The interior of the tank shall be cleaned by shot blasting and painted with two coats of heat resistant, oil insoluble paint. Adequately sized manholes shall be provided for ease of inspection and maintenance. Steel bolts and nuts exposed to atmosphere, shall be galvanized. The tank cover shall be removable and shall be suitably sloped so that it does not retain rainwater.

Lifting lugs and eyebolts shall be so located that a safe clearance is obtained without the use of a spreader, between the sling and transformer bushings.

Transformers of rating above 500 kVA shall be equipped with detachable or separately mounted radiator banks. Transformers of rating 500 kVA and below shall be provided with fixed type radiators. Fins of the radiators shall not have sharp edges and shall be rounded in shape.

When transformers are provided with separately mounted radiators, flexible joints shall be provided on the main oil pipes connecting the transformer tank to the radiator banks, to reduce vibration and facilitate erection and dismantling. The interconnecting pipes shall be provided with drain plug and air release vents.

The transformer core shall be constructed from high grade, non-ageing, cold-rolled, grain oriented, silicon steel laminations. The steel laminations shall be of "core" type. Each lamination shall be coated with insulation which is unaffected by the temperature attained by the transformer during service. Core laminations shall be annealed and burrs removed after cutting. Cut edges shall be insulated. The framework and clamping arrangements of core and coil shall be securely earthed inside the tank by a copper strap connection to the tank.

Windings shall be of insulated copper wire or copper strip. Windings and insulation shall be so arranged that free circulation of oil is possible between coils, between windings, and between winding and core. The windings shall be fully shrunk under vacuum before assembly. High voltage end-windings shall be suitably braced to withstand short circuit stresses and stresses caused up by surges.

Off-load taps shall be provided on the HV winding.

The core and coil assembly shall be dried out and impregnated under

vacuum.

The sequence and orientation of HV/LV side phase and neutral bushings shall be as specified in the latest edition of relevant IS.

Transformer shall operate without injurious heating at the rated KVA and at any voltage up to + 10 % of the rated voltage of any tap. Transformer shall be designed for 110 % continuous over fluxing withstand capability.

Noise level of the transformer shall be less than 80 dB.

Bushing

Solid porcelain bushings with brown glaze shall be used up to 12 kV class. Solid bushings shall have the characteristics specified in the latest edition of IS 2099. Bushings rated 400 A and above shall have non-ferrous flanges and hardware.

Cable Terminations

LV side cable boxes shall have sufficient space for segregating the cable cores and for adequate clearance in air between bare conductors at the terminals. Cable boxes shall be complete with necessary glands, lugs and armour grips.

All auxiliary wiring from current transformers, buchholz relay, oil/winding temperature indicators, etc. shall be marshaled to a separate weatherproof and vermin proof marshalling box with an independent access cover. The degree of protection of the enclosure of the marshalling box shall be IP 55.

The marshalling box shall be complete with necessary cable glands and cable lugs. The marshalling box and components shall comply with the requirements specified for control cabinets elsewhere in this specification.

Applicable Standards

The transformer and its accessories shall conform to the latest editions, including all amendments and revisions, of the following standards.

Power transformer	:	IS 1180, 2026/IEC 60076
Fittings & Accessories	:	IS 3639
Transformer oil	:	IS 335/IEC 60296
Bushing > 1000 V AC	:	IS 2099/IEC 60137

Fittings and Accessories

The following fitting and accessories shall be provided on the transformer.

Inspection manhole in the cover.

Lifting lugs for both the transformer and the core.

Two earthing terminals on opposite ends of the transformer tank.

Name plate, rating plate and diagram plate.

Radiator banks with suitably located thermometer pockets for measuring inlet and outlet oil temperature.

Conservator, complete with filling plug, sump and drain valves and a shut-off valve on the pipe connection between transformer tank and conservator, to permit removal of the conservator. The conservator shall be designed to maintain an oil seal upto a temperature of 1000 C.

Oil temperature indicator with a range of minimum 300 C upto the maximum operating temperature.

Weather proof dehydrating breather with activated alumina or silica gel as the

dehydrating agent.

For transformer rating above 500 kVA, magnetic type oil level gauge mounted on the conservator, and with a low oil level alarm contact and a waterproof and dustproof terminal box. For transformer less than 500 kVA, oil level indicator shall be provided.

Gas detector relays, with separate alarm and trip contacts, complete with shut-off valves.

Separate drain valve, oil-sampling valve with plug and a top filter valve on the tank.

Explosion vent with diaphragm. The device shall be rainproof. An equaliser pipe connecting the pressure relief device to the conservator shall be provided.

Separately mounted, waterproof and dustproof marshalling box (IP55) housing the oil temperature indicator with alarm and trip contacts and marshalling facilities for electrical devices mounted on the transformer. Winding temperature indicator shall be provided for transformer rating of 500 kVA and above.

Adequate number of air vents for relieving trapped air during oil filling and during maintenance.

Thermometer pockets and sensing element mounted on the transformer tank cover for measuring top oil temperature.

Bidirectional wheels for movement of the transformers.

Accessories for clamping the wheel to the foundation channel in order to withstand earthquake forces.

Adequate amount of insulating oil required for first filling, plus 10% excess oil.

Tolerance on Losses

The permissible tolerances on the guaranteed values of transformer losses shall be as per IS 2026.

Rejection

The Engineer or the Engineer's Representative reserves the right to reject the transformer if the same does not meet the specification requirement, subject to tolerances as per IS 2026. The rejected transformers shall be replaced by transformers complying with the requirements of this specification at the Bidder's cost.

If the commissioning of the project is likely to be delayed by the rejection of a transformer, the Engineer's Representative reserves the right to accept the rejected transformer until the replacement transformer is made available. Transporting the rejected and replacement transformers as well as installation and commissioning of both the transformers shall be at the Bidder's cost.

Technical Particulars

The specific technical particulars of the transformer shall be as given below:

Sr. No.	Description	Particulars
1	Rated output (kVA)	80

Sr. No.	Description	Particulars
2	Transformer installation	OutTender Documentoor plinth mounted
3	No load transformation ratio	11 kV/0.433 kV
4	Number of phases	Two
5	Rated Frequency	50 Hz
6	Impedance at principal tap	4.5 %
7	Number of windings / Material of conductor	Two / Copper
8	Type of cooling	ONAN
9	Vector group	Dyn 11
10	LV neutral earthing	Solidly earthed
11	Design ambient temperature.	50°C
12	Winding temperature rise measured by resistance method	45°C
13	Oil temperature rise by thermometer	40°C
14	Terminal connection	
a)	HV bushing	Bushings suitable for overhead ACSR "DOG" conductor
b)	LV cable box	Cable box suitable for terminating 1100 V, 31/2 core, PVC, AYFY cables (Number and size of cable shall be as per the one line diagram BIK/WW/01-26))
c)	LV Neutral	LV neutral shall be through a 1.1 kV rated bushing, both inside the cable box for forming the 3 Ph, 4-wire system and outside the cable box for direct connections to earth pits.

Tests

All tests required by the specification including repeated tests and inspection that may be necessary owing to the failure to meet any tests specified, shall be carried out at the Bidder's expense.

If the transformer fails to pass the tests specified, the Engineer shall have the option to reject the unit. Additional tests shall be conducted to locate the failure and after rectification, all tests shall be repeated to prove that the rebuilt transformer meets the specification in all respects, all at the Bidder's expense.

The following tests shall be carried out on the assembled transformer during inspection at the manufacturer's works.

- a) Temperature rise test on one transformer
- b) Measurement of resistance of windings at principal and extreme taps
- c) Ratio at each tap, polarity and phase relationships
- d) Measurement of impedance voltage at principal and extreme taps
- e) Measurement of no load current and no load losses at rated frequency and at both the rated voltage and 110 % rated voltage
- f) Measurement of efficiency at $\frac{1}{2}$, $\frac{3}{4}$ and full load
- g) Measurement of insulation resistance
- h) Induced over voltage withstand test
- i) Separate source voltage withstand test
- j) Magnetic unbalance test
- k) Impulse Test

In addition to the above tests, a withstand test with lightning impulse, chopped on the tail, shall be carried out on one limb of HV winding of the transformer if impulse test has not been already carried out on transformer of similar capacity in the last two years. Type test certificate shall be submitted along with the bid, if such a test has been already carried out. If the type test has to be carried out, it shall be at the Bidder's expense.

3.0 Main switchboard, other dbs and control panels/cabinets

The following clauses shall be deemed to apply for all LV switchboards, distribution boards/panels, marshalling boxes, control cabinets/panels, etc.

General Constructional Features

Sheet steel used for fabrication of switchboards, control cabinets, marshalling boxes, etc shall be cold rolled.

All panels, cabinets, kiosks and boards shall comprise rigid welded structural frames made of structural steel sections or of pressed and formed cold rolled sheet steel of thickness not less than 2 mm. The frames shall be enclosed by sheet steel of at least 2 mm thickness. Stiffeners shall be provided wherever necessary.

All doors, removable covers, gland plates, etc. shall be of at least 1.6 mm thickness and shall be gasketed all round the perimeter.

All doors shall be supported by strong hinges of the disappearing or internal type and braced in such a manner as to ensure freedom from sagging, bending and general distortion of panel or hinged parts.

All floor mounted panels/boards shall be provided with a channel base frame. Total height of all floor mounted cubicles/panels shall not be greater than 2300 mm. Where steel pedestals for mounting of boards/panels are specified, the total height including that of the pedestal shall not exceed 2500 mm.

Switchboard/control cabinet/panel shall be dust and vermin proof. Degree of protection of the enclosure shall be IP 54 for indoor installations and IP 55 for outdoor installations.

LV Switchboard

Separate, segregated metal clad compartments shall be provided for main and auxiliary bus bars, each feeder and cable alleys. Metal clad

cubicles/modules shall be provided with hinged doors in the front, with facility for padlocking door handles. More than one module may be arranged in the same vertical section. Circuits shall be of the fixed type. The switchboard enclosure shall conform to "Form – 4" as per IS-8623. It shall be possible to extend the switchboard on both sides.

The fixed type module shall have all the circuit components mounted in the compartment, with bolted type power and control connections. It shall be possible to remove all circuit components after removing the connections and the component fixing bolts.

Instruments, relays and control devices shall be mounted flush on hinged door of the cubicles. Switchboard shall be complete with inter-panel wiring.

Each switchboard shall also be fitted with a label indicating its title. Each cubicle shall be fitted with a label on the front and rear of the cubicle. Each relay, instrument, switch, fuse, contactor and MCCB/MCB shall be provided with a separate label.

One metal sheet shall be provided between two adjacent vertical sections running to the full height of the switchboard except for the horizontal bus bar compartment. However, each shipping sections shall have metal sheets at both ends.

After isolation of the power and control connections of a circuit, it shall be possible to carry out maintenance in a compartment safely, with the bus bars and adjacent circuits alive.

The current rating of outgoing feeders of any switchboard shall not be less than 10% of that of the incoming feeder. Deviation from this requirement shall be subject to the approval of the Engineer's representative.

The Screen DB cum Control Panel shall have separate control section for mounting control and indicating devices and control logic wiring. The power section shall be with compartmentalized modules.

Bus bars

The phase and neutral bus bars shall be of rating indicated in the corresponding one line diagram. Bus bars shall be of aluminium and shall be provided with minimum clearances as specified.

All bus bars and bus taps shall be insulated with close fitting sleeve of hard, smooth, dust and dirt free, heat shrunk PVC insulation of high dielectric strength, to provide a permanent non-ageing and non-tracking protection, impervious to water, tropical conditions and fungi. The insulation shall be non-inflammable and self extinguishing type and in fast colours to indicate phases. The dielectric strength and properties shall hold good for the temperature range of 0 to 95 degree centigrade. If the insulating sleeve is not coloured, bus bars shall be colour coded with coloured PVC tape at suitable intervals.

Bus bar joints shall be of the bolted type. Spring washers shall be provided to ensure good contact at the joints. Bus bars shall be thoroughly cleaned at the joints and suitable contact grease shall be applied just before making a joint.

Direct access to, or accidental contact with bus bars and primary connections shall not be possible. All apertures and slots shall be protected by baffles to prevent accidental shorting of bus bars due to insertion of maintenance tools.

Sequence of red, yellow and blue phases and neutral for four-pole equipment shall be left to right and top to bottom, for horizontal and vertical layouts respectively.

Circuit Breakers

4.0 Moulded Case Circuit Breaker (MCCB)

- MCCBs shall be of the air break, quick make, quick break and trip free type and shall be totally enclosed in a heat resistant, moulded, insulating material housing.
- MCCBs shall have an ultimate short circuit capacity not less than the prospective short circuit current at the point of installation.
- MCCBs shall have a service short circuit breaking capacity equal to the ultimate short-circuit capacity.
- Each pole of MCCB shall be fitted with a bi-metallic thermal element for inverse time delay protection and a magnetic element for short circuit protection. Alternatively, they shall be fitted with a solid state protection system. Such a protection system shall be fully self-contained, needing no separate power supply to operate the circuit breaker tripping mechanism. Thermal element shall be adjustable. Adjustments shall be made simultaneously on all poles from a common facility. Thermal elements shall be ambient temperature compensated.
- The MCCBs shall be provided with the following features.
 - Common trip bar for simultaneous tripping of all poles.
 - Shrouded terminals
 - Time for clearing short circuit current of 20 msec.
 - 2 NO + 2 NC auxiliary contacts

5.0 Miniature Circuit Breaker (MCB)

- MCB shall be hand operated, air break, quick make, quick break type.
- Operating mechanisms shall be mechanically trip-free from the operating knob to prevent the contacts being held closed under overload or short-circuit conditions.
- Each pole shall be fitted with a bi-metallic element for overload protection and a magnetic element for short-circuit protection. Multiple pole MCBs shall be mechanically linked such that tripping of one pole simultaneously trips all the other poles. The magnetic element tripping current classification shall be of the type suitable for the connected load. Where this is not specified, it shall be Type C.
- The short circuit rating shall be not less than that of the system to which they are connected.

Contactors

The power contactors used in the switchboard shall be of, air break, single throw, triple pole, electromagnetic type. Contactors shall be suitable for uninterrupted duty and rated for Class AC3 duty in accordance with the latest edition of IS 13947.

Operating coils of all contactors shall be suitable for operation on 240 V, single phase, 50 Hz supply.

Contactors shall be provided with at least two pairs of NO and NC auxiliary contacts.

Contactors shall not drop out at voltages down to 70 % of coil rated voltage.

Contactors shall be provided with a two element, positive acting, ambient temperature compensated, time lagged, hand reset type thermal overload relay with adjustable settings. The hand reset button shall be flush with the front door of the control module, and shall be suitable for resetting the overload relay with the module door closed. Relays shall be either direct connected or CT operated. Overload relay and reset button shall be independent of the "Start" and "Stop" push buttons. All contactor shall all be provided with single phasing preventer (SPP).

Motor starters shall be complete with auxiliary relays, timers and necessary indications.

Switch Disconnectors and Fuses

LV switch disconnectors shall be of the load break, fault make, group operated type. For use on 3-phase systems, the switches shall be of the triple pole type with a link for neutral wire. For use on single phase system and DC systems, the switches shall be of the two pole type.

Switch disconnectors shall be of the heavy duty, quick make and quick break type. Their contacts shall be silver plated, and contact springs shall be of stainless steel. Their handles shall have provision for locking in both fully open and fully closed positions. Mechanical ON-OFF indication shall be provided.

Switch disconnectors for controlling motor circuits shall be of the load break, fault make type, and shall be capable of breaking locked rotor current of the associated motor.

Where combination units of switch disconnector and fuses are used, the following interlocks shall be incorporated.

The fuses should not be accessible unless the switch disconnector is in fully open condition.

It should not be possible to close the switch disconnector when the fuse cover is open, but an authorised person may override the interlock and operate the switch disconnector. After such an operation, the cover shall be prevented from closing if the switch disconnector is left in the "ON" position.

All fuses shall be of the HRC cartridge type, mounted on plug-in type of fuse bases. Fuses shall be provided with visible indicators to show that they have operated. Current vs. time characteristics of all types of fuses shall be furnished to the Engineer's Representative.

Fuses and links functionally associated with the same circuit shall be mounted side by side.

An adequate number of spare fuse cartridges of each rating shall be supplied and fitted in clips inside the panel.

Instrument Transformers

Current transformer (CT) shall have polarity markings indelibly marked on each transformer and at the lead terminations at the associated terminal block.

CT shall be able to withstand the thermal and mechanical stresses resulting from the maximum short circuit current.

CT core laminations shall be of high grade silicon steel.

Secondary winding of voltage transformer (VT) shall be rated for a two phase line to line voltage of 110 V.

Identification labels giving type, ratio, output and serial numbers shall be

provided.

Relays

Main protective relays shall be Numerical / Static type.

All relays shall be enclosed in rectangular shaped, dustproof cases and shall be suitable for flush mounting.

All relays shall be accessible from the front for setting and resetting. Access to setting devices shall be possible only after the front covers of the relays are removed. Resetting facilities shall however be accessible external to the relay case.

All protective relays shall be of the draw-out type and shall be provided with operation indicators visible from the front.

Auxiliary relays and timers shall be rated to operate satisfactorily between 70 % and 110 % of the rated voltage.

Control and Selector Switches

Control and selector switches shall be of the rotary type, having enclosed contacts, which are accessible by the removal of the cover. Control and selector switches for instruments shall be flush mounted on the front of the panels and desks.

All control switches shall be of the spring return to normal type and shall have momentary contacts. Selector switches shall be of the stay-put, maintained contact type.

Indicating Instruments & Meters

Electrical indicating instruments shall be 110 mm square with 2400 scale. Taut band type of instruments are preferred. Taut band moving coil instruments for use on AC systems shall incorporate built-in transducers.

Instrument dials shall be white with black numbers and lettering.

Normal maximum meter reading shall be of the order of 60 % normal full scale deflection. Ammeters for motor feeders shall have suppressed scale to show current from full load upto six times the full load current.

Watt-hour meters shall be of the induction type and shall be provided with reverse running stops.

Instruments shall have an accuracy of Class 1.0.

Indicating lamps

Indicating lamps shall be of the cluster LED type, with low watt consumption. Indicating lamp shall be of the double contact, bayonet cap type rated for operation at either 240 V AC or at the specified DC system voltage as applicable. Lamps shall be provided with translucent lamp covers.

Bulbs and lenses shall be interchangeable and easily replaceable from the front.

Push Buttons

"Start" and "Stop" push buttons shall be coloured green and red respectively. Stop Push Button shall be lockable stay-put type with Mushroom head.

Space Heaters

Adequately rated anti-condensation space heaters shall be provided, one for each control panel, for each switchboard and for each marshalling kiosk.

Space heater shall be of the industrial strip continuous duty type, rated for

operation on a 240 V, 1 phase, 50 Hz, AC system.

Each space heater shall be provided with a single pole MCB with overload and short circuit release, a neutral link and a control thermostat to cut off the heaters at 450 C.

Cubicle Lighting/Receptacle

Each control panel, control cabinet, marshalling box, etc. shall be provided with interior lighting by means of a 20 W fluorescent tube lighting fixture. A MCB shall be provided for the lighting circuit. The lighting fixture shall be suitable for operation from a 240 V, 1 ph, 50 Hz, AC supply.

A 240 V, 1 phase, AC receptacle (socket) plug point shall be provided in the interior of each panel with a MCB for connection of hand lamp.

Safety Arrangements

All terminals, connections and other components, which may be "live" when front access door is open, shall be adequately screened. It shall not be possible to obtain access to an adjacent cubicle or module when any door is opened.

Components within the cubicles shall be labeled to facilitate testing.

Power and Control Cable Terminations

Equipment terminal blocks for power connections shall be complete with adequate phase segregating insulating barriers, shrouds and suitable crimping type of lugs for terminating the cables. Double compression type cable glands shall be provided for all power and control cables.

Earthing connectors between cable armour and earth shall be routed outside the cable gland in an approved manner. Gland insulation shall be capable of withstanding a high voltage test of 3000 V for one minute.

Wiring for Control and Protective Circuits

All wiring for control, protection and indication circuits shall be carried out with 650 V grade, PVC insulated cable with stranded, tinned copper conductor of minimum 1.5 sq. mm size. The size of conductor for CT circuits shall be minimum 2.5 sq. mm.

All wiring shall be run on the sides of panels and shall be neatly bunched and cleated without affecting access to equipment mounted in the panel. All wiring shall be taken to terminal blocks without joints or tees in their runs.

All wiring shall be colour coded as given below.

Instrument Transformer	:	Red, Yellow or Blue determined by the
circuit		phase with which the wire is associated
A C phase wire	:	White
A C neutral	:	Black
D C circuits	:	Grey
Earth connections	:	Green

Engraved core identification ferrules, marked to correspond with the wiring diagram, shall be fitted to each wire and each core of multicore cables terminated on the panels. Ferrules shall fit tightly on wires, without falling off when the wire is removed. Ferrules shall be of yellow colour with black lettering.

All wires forming part of a tripping circuit shall be provided with an additional

red ferrule marked 'T'. Each wire shall be identified by a letter to denote its function followed by a number to denote its identity, at both ends. Unused core of multicore cables shall be ferruled U1, U2 etc., at both ends, and connected to spare terminals.

Spare auxiliary contacts of electrical equipment shall be wired to terminal blocks.

Control Wiring Terminal Blocks

Terminal blocks shall be of the 650 V grade and stud type. Brass stud of at least 6 mm dia. with fine threads shall be used and securely locked within the mounting base to prevent turning. Each terminal shall comprise two threaded studs, with a link between them, washers, and matching nuts and locknuts for each stud. Connections to the terminals shall be at the front.

Terminals shall be numbered for identification, grouped according to function. Engraved 'black on-white' labels shall be provided on the terminal blocks describing the function of the circuit.

Terminals for circuits with voltage exceeding 110 V shall be shrouded. Terminal blocks at different voltages shall be segregated into groups and distinctively labeled.

Terminals used for connecting current transformer secondary leads shall be 'disconnecting and shorting' type with a facility grounding the secondary.

Terminal blocks shall be arranged with 100 mm clearance, between any two sets.

Separate terminal stems shall be provided for internal and external wiring respectively.

All wiring shall be terminated on terminal blocks, using crimping type lugs or claw type of terminations.

Test Terminal Blocks

Test terminal blocks, if any, shall be provided for secondary injection and testing of relays. A suitable metering block shall be provided where specified for the connection of a portable precision instrument to be operated when required for specific plant testing purposes.

Earthing of Switchboards/Panels

Each switchboard, control panel, etc. shall be provided with an earth busbar running along its entire length. The earth busbar shall be located at the bottom of the board/panel.

Earth busbars shall be of copper and shall be rated to carry the rated symmetrical short circuit current of the associated board/panel for one second, unless otherwise specified. Earth busbars shall be properly supported to withstand stresses induced by the momentary short circuit current of value equal to the momentary short circuit rating of the associated switchboard/panel.

Positive connection of the frames of all the equipment mounted in the switchboard to the earth busbar shall be maintained through insulated conductors of size equal to the earth busbar or the load current carrying conductor, whichever is smaller.

All instrument and relay cases shall be connected to earth busbar by means of 650 V grade, green coloured, PVC insulated, stranded, tinned copper, 2.5 sq. mm conductor looped through the case earth terminals.

Applicable Standards

The following standards and codes of practice shall be applicable. These shall be the latest editions including all official amendments and revisions. The standards referred to therein shall also be applicable.

Air break switches, MCCBs, etc.	:	IS 13947
for voltage not exceeding 1000 V AC or 1200 V DC		
Current transformer	:	IS 2705 / IEC 60044
Voltage transformer	:	IS 3156 / IEC 44, 60186
Electrical Relays	:	IS 3231, 3842 / IEC 60255
Contactors for voltage not exceeding 1000 V AC	:	IS 13947 / IEC 60947
Control Switches	:	IS 6875 / IEC 60947
High Voltage Fuses	:	IS 9385 / IEC 60282
Low voltage Fuse	:	IS 13703 / IEC 60269
Electrical direct acting indicating instruments	:	IS 1248 / IEC60051
AC electricity meters of of induction type for voltage greater than 1000 volts	:	IS 722, 8530 / IEC 60145, IEC 60211
Porcelain post insulators for system with nominal voltages greater than 1000 volts	:	IS 2544
Specification for copper rods and bars for electrical purposes	:	IS 613
Specification for low voltage switchgear and control gear	:	IS 13947 / IEC 60947
Degree of protection provided by enclosures for low voltage switchgear and control gear	:	IS 13947 / IEC 60947
Marking and arrangement for switchgear, busbars, main connections and auxiliary wiring	:	IS 5578 / IS 161.253
Code of practice for selection, installation and maintenance of switchgear and control gear	:	IS 10118
Miniature Circuit Breakers	:	IS 8828 / IEC 60898
Control Switches/ Push buttons	:	IS 6875
Low Voltage Switch Gear & Control Gear	:	IS 8623
Technical Particulars		

The specific technical particulars of switchboard shall be as given below:

Sr. No.	Description	Particulars
1	Rated voltage, Phases and Frequency	415 V, 3 Ph, 50 Hz
2	Type of Construction	Single front, fixed type
3	Maximum system voltage	476 V
4	One minute Power Frequency withstand voltage	
a)	Power circuit	3000 V (rms)
b)	Control Circuit	2000 V (rms)
c)	Auxiliary circuit connection to secondary of CTs	2000 V (rms)
5	Current rating of busbars over design ambient temperature of 45°C	As per Line Diagram got to be approved from Project Manager
6	Short circuit withstand for main and auxiliary busbars (1 sec.)	As per Line Diagram got to be approved from Project Manager
7	Maximum temperature of main and auxiliary busbars at continuous rated current rating under site design ambient temperature of 45°C	85°C
8	Colour finish shade as per IS:5	
a)	Interior	Glossy white
b)	Exterior	Light gray, semi-glossy, shade 631 of IS 5
9	Earthing bus material and size	Copper, 25 x 6 mm
10	Clearances in air of live parts	25.4 mm
11	Power contactors	
a)	Contactor rated duty	Uninterrupted
b)	Utilisation category	AC3
12	Motor Starters	For motor < 5 kW – DOL For motor > 5 kW – Star-Delta
13	Type of Mounting	Floor
14	Cable Entry	Bottom
15	Design ambient Temperature	45°C

Tests

The following routine tests shall be carried out on the assembled switchboard/panel during inspection at the manufacturer's works in addition to other tests.

One minute power-frequency voltage dry withstand tests on the main circuits

One minute power-frequency voltage dry withstand tests on the auxiliary circuits

Operational checks

6.0 Capacitors and APFC panel

General

The capacitor bank shall be complete with all parts that are necessary or essential for efficient operation. Such parts shall be deemed to be within the scope of supply whether specifically mentioned or not. It shall be complete with the required capacitors along with the supporting post insulators, steel rack assembly, copper bus bars, copper connecting strips, foundation channels, fuses, fuse clips, etc. The steel rack assembly shall be hot dip galvanised.

The capacitor bank may comprise of suitable number of single phase units in series parallel combination. However, the number of parallel units in each of the series racks shall be such that failure of one unit shall not create an over voltage on the units in parallel with it, which will result in the failure of the parallel units. The assembly of the banks shall be such that it provides sufficient ventilation for each unit.

Each capacitor case and the cubicle shall be earthed to a separate earth bus.

Capacitor shall conform to IS 2834. Capacitors shall be of mixed dielectric or APP type. Each unit shall satisfactorily operate at 61.25 % of rated kVAR including factors of overvoltage, harmonic currents and manufacturing tolerance. The units shall be capable of continuously withstanding satisfactorily any overvoltage up to a maximum of 10 % above the rated voltage, excluding transients.

Each capacitor unit/bank shall be fitted with directly connected continuously rated, low loss discharge device to discharge the capacitors to reduce the voltage to 50 volts within one minute upon disconnection, in accordance with the provisions of the latest edition of IS:2834.

Unit Protection

Each capacitor unit shall be individually protected by a HRC fuse suitably rated for load current and interrupting capacity, so that only the faulty capacitor unit will be disconnected without causing the bank to be disconnected. An operated fuse shall give visual indication so that it may be detected during periodic inspection. The fuse breaking time shall co-ordinate with the pressure built up within the unit to avoid explosion. Mounting of the individual fuse should be internal to the capacitor case.

APFC microprocessor based relay shall automatically switch ON/OFF the capacitor banks to attain the value of "pf" close to the set value. Switching shall follow first in first out (FIFO) method to ensure uniform use of all capacitor banks. At least eight steps shall be provided for switching.

Capacitor (APFC) Control Panel

Capacitor and capacitor control shall be housed in a metal enclosed cubicle. Capacitor shall be housed in the lower compartment and capacitor control unit at the top compartment, the two compartments being segregated.

The cubicle shall be fabricated out of 2 mm thick cold rolled sheet steel and shall of a degree of protection of IP 54. The panel shall comprise:

Isolating MCCB

Contactors with overload element

Relays responsive to current/voltage/kVAR/pf for automatic switching

Sequencing devices, timers and auxiliary relays for automatic sequential switching of capacitor units in and out of circuit

Auto-manual selector switch

Microprocessor based Automatic Power Factor Correction (APFC) Relay

Push button for opening and closing the power circuit

Red and Green lamps for capacitors ON/OFF indication

Protective relays to protect the healthy capacitor units when one unit fails in a series connection

Space heater and cubicle lighting

Technical Particulars

The specific technical particulars of capacitors shall be as given in the table below.

Sr. No.	Description	Particulars
1	Rated Capacity	35 kVAr
2	Rated voltage, frequency and phases	433 V, 50 Hz, 3 Phase
3	Insulation level	3 kV (rms)
4	Capacitor bank connection	Delta
5	Control	Automatic by "pf" correction relay (micro-processor based)
6	No. of steps for control	At least 8
7	Capacitor Bank Enclosure	
a)	Type	Floor mounted
b)	Colour finish / shade	Interior : glossy white Exterior : Light grey, semi glossy, shade 631 of IS 5
8	Design ambient Temperature	45°C

Tests and Test Reports

All tests shall be conducted in accordance with the latest edition of IS:2834 and as applicable for the controls. Type test certificates for similar capacitor units shall be furnished.

7.0 Local push button stations

Constructional features

The constructional features of the local push button stations shall be as follows.

They shall be metal enclosed, weather proof and suitable for mounting on wall or steel structures. The enclosure shall be of die cast aluminium or 16 SWG GS sheet.

Outdoor type push button stations shall be completely weather, dust and vermin proof and shall be provided with canopy. They shall have a degree of protection shall be IP 55. Indoor type push button stations shall have a degree of protection shall be IP 54.

They shall be provided with inscription plates of rear engraved Perspex with white letters on black background. The letter size shall be 6 mm.

They shall be provided with two earthing terminals suitable for 12 SWG GI wire.

They shall be provided with removable undrilled gland plate and cable glands for appropriate sizes of cable. The cable entry shall be from the bottom.

Push buttons

All push buttons shall be

fitted with two (2) each normally open and normally closed contacts rated to carry and break 10 Amps at 415 Volts;

provided with integral escutcheon plates marked with its function;

of the momentary contact push to actuate type and shall be green in colour;

lockable stay put type with mushroom knob and shall be red in colour in case of "Stop" PB; and

with contacts designed to be robust for both mechanical and electrical operation. Mechanical life shall exceed 10 million switching operations.

Local push button stations shall be provided for equipment in sewage treatment process, if required.

8.0 Power and control cables

General Requirements

Cables shall be laid under the following conditions.

In air	:	Ambient temperature of 450 C
In ground	:	Ground temperature of 350 C
Depth of laying in	:	750 mm for LV cables (Single Layer)
Ground		
In conduits/pipes	:	Space factor of not more than 60 % (ratio of cable area to internal conduit area)
In trays	:	Single layer, touching each other

Cables shall be rated for 1100 V and shall conform to the latest edition of IS 1554. Cable shall be insulated with extruded PVC type 'A'. The inner sheath over laid up covers and outer sheath over the armour shall be of extruded PVC compound type ST-1. Power cable shall be of stranded aluminium conductor of grade H4 as per IS 8130, while control cable shall be of stranded, tinned, annealed, copper conductor with a minimum size of 1.5 sq. mm. Size of conductor for CT cables shall be 2.5 sq. mm. The core identification shall be by printed numerals.

Applicable standards

The standards and code of practices referred to below shall be the latest editions including all official amendments and revisions.

PVC insulated cables	:	IS 1554
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PVC insulation and sheath of electric cables	:	IS 5831
Conductors for insulated electric cables	:	IS 8130

Inspection & testing

The cables shall be tested in accordance with the latest edition of IS:1554. The test shall include

Test for conductor**Test for thickness of insulation****Test for laying up****Test for thickness of laying up****Test for thickness of inner sheath****Test for armouring****Test for thickness of outer sheath****9.0 Earthing system****Scope**

The scope includes supply of earthing conductors and earth electrode pits and their installation including associated civil work as per the specifications and drawings, to the satisfaction of the Engineer's representative and the Electrical Inspector.

Proper earthing shall be provided to ensure adequate system neutral earthing and for equipment and personnel safety.

All work such as cutting, bending, supporting, painting/coating, drilling, welding, clamping, bolting and connection to structures, equipment frames, terminals, etc. shall be in the Bidder's scope of work. All incidental hardware and consumables such as fixing cleats/clamps, anchor fasteners, lugs, bolts, nuts, washers, bituminous compound, welding rods, anti-corrosive paint as required for the complete work shall be deemed to be included by the Bidder as part of the installation work.

Earthing System Installation

Earthing system shall conform to the latest edition including all official amendments and revisions of IS: 3043 and Indian Electricity Rules, 1956. All materials and fittings used in the earthing installation shall conform to the relevant Indian Standards or shall be as approved by the Engineer's Representative. Installation work shall be in accordance with approved earthing layout drawings and any change in routing, size of conductors etc. shall be subject to the prior approval of the Engineer's Representative.

Installation of earth conductors in outdoor areas, buried in ground, shall include excavation of trench of size 600 mm deep and 450 mm wide, laying of conductor at 600 mm depth, welding as required of main grid conductor joints; as well as provision of risers upto 500 mm above ground at required locations and then backfilling of excavated area by material that is free from stones and other harmful mixtures. Backfill shall be placed in layers of 150 mm, uniformly spread along the trench and compacted by approved means. If the excavated soil is found unsuitable for backfilling, the Bidder shall arrange for suitable material from outside.

Metallic frames of all electrical equipment shall be earthed by two separate

and distinct leads and then connected with earthing system

Neutral points of transformers shall be earthed by two separate and distinct connections to two treated electrode pits.

Crane rails shall be connected to the earthing system.

An earthing pad shall be provided under each operating handle of the disconnector. Operating handle of the disconnector and the supporting structure shall be bonded together by a flexible connection and connected to earth grid.

Cable sheaths and armour shall be bonded to the earthing system. Metal pipes and cable conduits shall be effectively bonded and earthed.

Neutral connection shall never be used for equipment earthing.

The scope of installation of earthing leads to the equipment and risers on steel structures/walls shall include laying the conductors, welding/cleating at specified intervals, welding to the main earth grids, risers, bolting at equipment terminals and coating welded joints by bituminous paint. Galvanised conductors shall be touched up with zinc-rich paint, when holes have to be drilled in them at site for bolting to equipment/structure.

The substation consisting of structure, transformer, fence and gate shall be properly earthed.

Wherever earthing conductor crosses under ground service duct and pipes, it shall be laid 300 mm below them. If the distance is less than 300 mm, the earthing conductor shall be bonded to such service ducts/pipes.

Wherever earthing conductor passes through walls, GS sleeves shall be provided for the passage of earthing conductor. The pipe ends shall be sealed by suitable water-proof compound. Water stops shall be provided where earthing conductor enters the building from outside, below grade level.

Connections

All connections in the main earth conductors buried in earth/concrete shall be welded type. Connection between earthing conductor and earth leads shall also be of welded type. Connection between buried MS conductor and GS conductor above ground shall be done above ground.

Connection between earth leads and equipments shall be of bolted type.

Earth Electrode Pits

Electrodes shall, as far as practicable, be embedded below permanent moisture level.

Test pits with concrete covers shall be provided for periodic testing of earth resistance. Installation of pipe electrodes in test pits shall be suitable for watering. The necessary materials required for installation of test pits shall be supplied and installed by Bidder. The installation work shall also include civil works such as excavation/drilling and connection to main earth grid.

Treated earth pits shall be treated with salt and charcoal. Soil, salt and charcoal placed around the electrode shall be finely graded, free from stones and other harmful mixtures. Backfill shall be placed in layers of 250 mm thick uniformly spread and compacted. If excavated soil is found unsuitable for backfilling, the Bidder shall arrange for a suitable soil from outside.

Technical Particulars

The specific technical particulars of earthing system shall be as given below.

Sr.	Description	Size & Material	No. of Leads
1	33 kV equipment, transformer neutral, body and 2-pole structure	50 x 6 mm GS flat	2 each
2	Main LV Switchboard at STPs	50 x 6 mm GS flat	2
3	STP Distribution board	50 x 6 mm GS flat	2
4	Capacitor Control panel	50 x 6 mm GS flat	2
5	Cable tray support	50 x 6 mm GS flat	2
6	DBs & LPs	25 x 3 mm GS flat	2
7	Local PB station	12 SWG – GS	1
8	Motors		
a)	Small motors	8/12 SWG GS wire	2
b)	Main motors	50 X 6 mm GS flat	2
9	Earth Electrode	40 mm dia., 3 M long, heavy duty GI pipe electrode	-
10	Main grid buried in ground	50 x 6 MS flat	-

10.0 Cabling system

General

The cabling system covers the supply of cable trays, racks, supports and associated accessories, hardware and their installation. It shall be the responsibility of the Bidder to complete the cabling system in all respects.

The following points shall be noted while planning cabling system.

Inside the building : Cable trenches with cable racks and or cable trays

Cables shall be clamped to the cable racks at regular intervals

All cable trays shall be hot dip galvanized while racks and supports shall be painted.

All steel sections such as angles, channels, brackets etc., required for supporting the cable trays shall be supplied by the Bidder and fabricated at site.

Flexible metallic conduits shall be used for termination of connection to equipment such as motors, limit switches and other apparatus.

Installation of Cables

The Bidder shall install, test and commission the cables in accordance with the approved drawings, and instructions issued by Engineer's Representative. Cables shall be laid directly buried in earth, on cable racks, in built up trenches and supports, on trays, in conduits and ducts or bare on walls, ceiling etc. as per approved drawings. Bidder's scope of work includes unloading, laying, fixing, jointing, bending, and termination of the cables. The Bidder shall also supply the necessary materials and equipment required for jointing and termination of the cables.

All apparatus, connections and cable work shall be designed and arranged to minimise risk of fire and any damage, which might be caused in the event of fire. Wherever cables pass through floor or wall openings or other partitions, suitable bushes of an approved type shall be supplied and put into position by the Bidder. The Bidder shall seal the cables into the bushes using fire resisting materials to prevent the spreading of fire through each partition.

Standard cable grips and reels shall be utilised for cable pulling. If unduly difficult pulling occurs, the Bidder shall check the pull required and suspend pulling until further procedure has been approved by the Engineer's Representative. The maximum pull tension shall not exceed the recommended value for the cable measured by the tension dynamometer. In general, any lubricant that does not injure the overall covering and does not set up undesirable conditions of electrostatic stress or electrostatic charge may be used to assist in the pulling of insulated cables in conduits and ducts.

After pulling the cable, the Bidder shall record cable identification with date pulled neatly with waterproof ink in linen tags / aluminium tag and shall securely attach such identification tags. Identification tags shall be attached to each end of each cable with non-corrosive wire. The said wire must be non-ferrous material on single conductor power cable. Tags may further be required at intervals on long runs of cables on cable trays and in pull boxes. Cable and joint markers and RCC warning covers shall be provided wherever required.

Sharp bends and kinks in cables shall be avoided. The bending radii for various types of cables shall not be less than 15 times the overall diameter of the cable.

Power, control and instrumentation cables shall be laid in separate cable racks/trays.

Where cables cross roads or water/sewage pipes, the cables shall be laid in reinforced spun concrete or steel pipes. For road crossings, the pipe for the cables shall be buried at not less than one metre depth.

Cables laid in ground shall be laid on a 75 mm riddled earth bed. The cables shall then be covered on top and at their sides with riddled earth of depth of about 150 mm. This should be then filled upto a depth of about 100 mm above the top of uppermost cable to provide bedding for the protective cable covers which shall be placed centrally over the cables. The protective cable covers for LV cables may be of earthenware and for HV cables of reinforced concrete. The RCC covers shall have one hole at each end, to tie them to each other with GI wires to prevent displacement. The trench should be then backfilled with the excavated soil and well rammed in successive layers of not more than 300 mm thick, with the trenches being watered to improve consolidation wherever necessary. To allow for subsidence, a crown of earth not less than 50 mm in the center and tapering towards the sides of the trench should be provided.

Each cable shall be pulled into the particular conduit and shall be taken from the particular reel designated for the run. In hand holes, pull boxes or junction boxes having any dimension over 1000 mm, all conductors shall be cabled and/or racked in an approved manner. Care shall be taken to avoid sharp bending or kinking cables, damaging insulation or stressing cable beyond manufacture's recommendations in pulling. Cable shall be protected at all times from mechanical injury and from absorption of moisture at unprotected ends.

In each cable run, some extra length shall be kept at a suitable point to enable one or two 'straight through joints' to be made, should the cable

develop a fault at a latter date.

Cables on cable racks, and conduits shall be formed to avoid bearing against edges or trays, racks, conduits or their supports upon entering or leaving racks or conduits.

Cables splices shall not be used except where permitted by the Engineer's Representative. Splices shall be made by Bidder for each type of wire or cable in accordance with the instructions issued by cable manufacturers and the Engineer's Representative. Before splicing, insulated cables shall have conductor insulation stepped and bound or penciled for recommended distance back from splices to provide a long leakage path. After splicing, insulation equal to that on the spliced conductors shall be applied at each splice.

At cable terminal points, where the conductor and cable insulation will be terminated, terminations shall be made in a neat, skilful and approved manner by specially trained staff. Terminations shall be made by the Bidder for each type of wire or cable in accordance with instructions issued by cable manufacturers or the Engineer's Representative.

Control cable termination shall be made in accordance with wiring diagrams, using proper colour codes for the various control circuit, by code marked wiring diagram.

When control cables are to be fanned out and corded together with cord, the Bidder shall corded together. If there is any doubt about correctness of connection, the Bidder shall make a temporary connection with sufficient length of cable so that the cable can be switched to another terminal without splicing. After correct connections are established, cables shall be cut to their correct lengths, connected to terminals in the specified manner, and corded together where necessary to hold them in place in a skillful manner. Jointing of cables shall be in accordance with relevant Indian Standards Codes of Practice and manufacturer's instructions.

Materials and tools required for cable jointing work, including cold setting bituminous compound shall be supplied by the Bidder. Cables shall be firmly clamped on either side of a 'straight through joint' at a distance of not more than 300 mm away from the joints. Identification tags shall be provided at each joint at all cable terminations.

Cable seals shall be examined to ascertain if they are intact and that cable ends are not damaged. If the seals are found to be broken the cable ends shall not be jointed until after due examination and testing under supervision of the Engineer's Representative. Before jointing is commenced, insulation resistance of both sections of cables to be jointed shall be checked by Megger.

After installation and alignment of motors, the Bidder shall complete the conduit installation, including a section of flexible conduit between motor terminal box and trench/tray. The Bidder shall install and connect the power, control and heater supply cables as per equipment manufacturer's drawings, if any. The Bidder shall be responsible for correct phasing of the motor power connection and shall interchange connections at the motor terminal box, if necessary, after each motor is test run.

Connections to recording instruments, float switches, level electrodes, limit switches, pressure switches, thermocouples, thermostats and other miscellaneous equipment shall be done as per manufacturer's drawings and instructions.

Metal sheath and armour of the cable shall be bonded to the earthing system

of the station. The size of conductor for bonding shall be appropriate with the system fault current.

All cables shall be tested for insulation resistance before jointing. After jointing is completed, all cables shall be tested again by a 1000 volt Megger.

Cable core shall be tested for

- a) Continuity;
- b) Absence of cross phasing;
- c) Insulation resistance to earth; and
- d) Insulation resistance between conductors.

Bidder shall furnish testing kits and instruments required for field testing.

11.0 substation equipment with structure and overhead line

General

The scope of supply consists of a two pole (or more, as required) galvanised steel (GS) structure fabricated out of ISMBs and ISMCs; PCC poles for drawing overhead line; GS structural sections for supporting and fixing various equipment; transformer, lightning arresters, disconnector, drop-out fuses, insulators and hardware, ASCR conductor, etc.; fixing accessories, and chain link fencing with padlockable gate.

The design, material, construction, manufacture, inspection and testing of all HV out Tender Document or substation equipment and overhead line shall comply with the currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed.

The equipment shall conform to applicable standards. All standards and code of practices shall be the latest editions including all official amendments and revisions.

The details of the steel structure and support sections/members shall be subject to approval of structural design calculations to be furnished by the Bidder.

Disconnector

Constructional Features

- a) The disconnectors shall conform to IS 9921 and IEC 60129.
- b) The disconnector switch shall be complete with all parts that are necessary for complete operation. Such parts shall be deemed to be within the scope of supply, whether specifically mentioned or not. Clamps/connectors shall also be supplied.
- c) The disconnector design shall be such that it is free from visible corona discharge in both closed and open positions, at the visible discharge test voltages as per the applicable standards.
- d) The disconnector shall be provided with high current carrying contacts on the hinge and jaw ends. All contact surfaces shall be silver faced copper.
- e) The disconnector handle shall be provided with a padlocking facility to lock it in fully open or fully closed positions. Rust proof padlocks shall be supplied with the disconnectors.
- f) Insulator used in the assembly of disconnector shall be of porcelain and of brown colour. Insulator cap and base shall be of high-grade cast steel or malleable steel casting and they shall be machine faced and

galvanised.

- g) Disconnecter base shall be of galvanized steel.

Operating Mechanism

- a) Operating devices for disconnector shall be manually operable.
- b) Operating mechanism shall provide a quick, simple and effective operation. One man shall be able to operate the disconnector without undue effort.
- c) The manual operating handles shall be mounted on the base of the supporting structure. Guide bearings shall be provided at a height of 750 mm above grade level. All brackets, angles, guides, guide bearings or other members necessary for attaching the operating mechanism and the operating handles to the supporting structure shall be supplied as an integral part of the disconnector. Rustproof pins and bearings of bronze bushing, ball and roller type, shall be furnished. All bearings shall be weather protected by means of covers and grease retainers. Bearing pressures shall be kept low to ensure long life and ease of operation.
- d) Disconnecter and its operating mechanism shall be such that it cannot be dislodged from its open or closed positions by gravity, wind pressure, vibrations, shocks or accidental touching or breaking of the connecting rods or the operating mechanism.

The specific technical particulars of disconnectors shall be as given below.

Sr. No.	Description	Particulars
1	Installation	Outender Document or
2	Rated voltage	11 kV
3	Rated Current	200 A
4	Frequency	50 Hz
5	Short circuit withstand rating for one second	16 kA (rms)
6	Design ambient temperature	50° C
7	Impulse withstand voltage across the isolating distance Across the isolating distance. Between poles and earth	195 kV rms 170 kV rms
8	One minute power frequency withstand voltage kV Across the isolating distance. Between poles and earth	80 kV rms 70 kV rms
9	Phase spacing (minimum)	914 mm

12.0 Lightning arrester

Lightning arrester (LA) shall be of outDoor, metal oxide (gapless) type and shall conform to IEC 60099.

LA shall be of hermitically sealed type and of self-supporting construction, suitable for mounting on steel structures.

Housing of the LA shall be of porcelain, having adequate mechanical strength and rigidity for satisfactory operation under climatic conditions obtaining at site. Porcelain shall be finely glazed and shall be free from imperfections.

LA shall incorporate anti-contamination feature to prevent arrester failure, consequent to uneven voltage gradient in the event of contamination of the arrester housing.

LAs shall be complete with insulating base with a provision for bolting to flat surface of supporting structure.

LA shall be complete with line and earth terminals. The terminal clamps/connectors on the earth terminal of the arresters and the discharge counter incoming and outgoing terminals shall also be provided.

The specific technical particulars of the LA shall be as given in the table below.

Sr. No.	Description	Particulars
1	Type	Metal Oxide (Gapless)
2	Rated voltage	30 kV
3	Rated frequency	50 Hz
4	Nominal discharge current 8/20 Micro Sec current wave	10 kA (peak)
5	High current impulse 4/10 Micro Sec current wave	100 kA (peak)
6	Residual voltage corresponding to steep current impulse of 10 kA (peak)	108 kV (peak)
7	Long duration line discharge capability	Class 2
8	Lightning impulse withstand voltage of housing 1.2/50 Micro Sec current wave	180 kV (peak)
9	Total creepage distance of housing	900 mm

13.0 Insulators

The porcelain post insulators shall conform to IS 2544 and IEC 60273, the insulators for overhead lines shall conform to IS 731 and IEC 60305, 433 and the insulator fittings shall conform to IS 2486.

Porcelain used for the manufacture of insulators shall be homogeneous, free from flaws or imperfections that might affect the mechanical or dielectric quality. They shall be thoroughly vitrified, tough and impervious to moisture. The glazing of the porcelain shall be of uniform brown color, free from blisters, burns and other similar defects. The porcelain shall be sound, free from defects and smoothly glazed. Insulators shall have compression type glaze with a good lustre.

Insulators shall be designed to avoid excessive concentration of electrical stresses in any section or across leakage surfaces. Design features, which increase radio influence level, shall be avoided.

All metal parts shall be made of commercial grade malleable iron or open hearth or electric furnace steel, hot dip galvanised to relevant standards. Castings, if any shall be free from blow holes, cracks and such other defects.

The specific technical particulars of insulator shall be as given in the table below.

Sr.	Description	Particulars	
		Strain	Post
	Type		
1	Rated voltage	11 kV	11 kV
2	Type of insulators	Disc	Stack
3	No. of insulators	3 per string	2 no.
4	Impulse withstand voltage of 1.2/50 micro sec. Wave	180 kV (peak)	180 kV (peak)
5	Power frequency voltage withstand	70 kV rms	70 kV rms
6	Dry	75 kV	75 kV
	Wet	75 kV	75 kV
7	Visible discharge power frequency test	27 kV	27 kV
8	Total creepage distance	900 mm	900 mm

14.0 Drop-out fuses

Drop-out fuse assembly shall be complete with fuse carrier, post insulator, jaw and hinge, live parts, terminals, channel base, fixing bolts, nuts and washers. Fuse links shall also be supplied.

All materials used in the manufacture of drop-out fuses shall be suitable for conditions specified and shall withstand variations of temperature and atmospheric conditions without deterioration or distortion of any kind in any part. All non-metallic parts of fuse carrier shall be of tough, non-ignitable insulating materials.

Mounting of drop-out fuses shall be such that its isolation/removal/replacement is easy. It shall have positive guides for this purpose.

Bird proof constructional features shall be provided.

It shall be possible to adjust spring pressure of the top contact to ensure consistent performance

All current carrying parts shall be of copper alloy. The contacts shall be of gun metal brass or phosphor bronze. The contact surface shall be silver plated to ensure low contact resistance.

Fuse links shall be of such construction as to prevent danger from

overheating, arcing and scattering of hot metal or powder or emission of flame, when operating in service.

When the fuse link ruptures or when the fuse carrier is pulled downwards, the carrier shall swing free to an inverted position. The carrier shall be brought to a cushioning stop to eliminate shock on the carrier and lower insulator unit.

The base channel and all ferrous parts shall be hot-dip galvanised as per the applicable standards.

Drop-out fuse base channel shall bear a name plate describing the major technical particulars. Fuse base, fuse link and fuse carrier shall bear the markings as per IS.

An operating rod with provision at the top for switching and removing fuse carrier shall be provided. The rod shall be minimum 6.0 metre long unless otherwise stated.

Multi-bolt (bi-metallic) terminal clamps shall be provided at the top and bottom of fuse base contacts suitable for connection to the ACSR conductor.

Fuse kit shall be supplied, consisting of fuse-link assembly, refusing tool and any other item necessary to restore the fuse units to service after an operation.

Drop-out fuse frame shall have two earthing terminals.

The specific technical parameters of drop-out fuse shall be as given below.

Sr.No.	Description	Particulars
1	Installation	OuTender Documentoor
2	Rated Voltage	11 kV
3	Rated Frequency	50 Hz
4	Rated Current of contacts	200 Amp
5	Rated current of fuse links	10 A

15.0 Hardware fittings

All hardware shall be drop forged from high carbon steel. All ferrous parts shall be hot dip galvanised as per the applicable standards.

All clevis fittings and shackles shall be furnished with a high strength, high carbon steel galvanised bolt with nut and cotter key.

16.0 Acsr conductors

The overhead/exposed connections shall be made by acsr (aluminum conductor steel reinforced) conductor and shall conform to IS 398 and BS 215: part 2.

Aluminum strands of ASCR conductor shall be hard drawn from 99.5 % pure electrolytic aluminium rods with 60 % IACS conductivity.

The surface of conductor shall be clean and dry and free from any excess grease that may be used in its construction. The surface strands shall be smooth and free from burrs and other projections.

No joints shall be present in aluminium and steel wires.

The steel wire strands shall be hot dip galvanised. Zinc coating shall be even and uniform.

17.0 Clamps & connectors

The clamps and connectors shall be made of materials listed below:

For connecting ACSR Conductors : Aluminium alloy casting

For connecting equipment from terminals made of copper with 4 mm of brass to ACSR : Bimetallic connectors made aluminium alloy casting, thick cast copper alloy liner

Bolts, nuts, plain washers : Hot dip galvanised mild steel

and spring washers for the 2629/2633 conforming to IS above

Contact paste shall not decay, evaporate, harden or crack under the service conditions described in the Specification.

The clamps shall be easy to handle and shall have low effective power loss. The electrical power connectors shall conform to IS 5561 and BS 159.

All casting shall be free from blow holes, surface blisters, cracks and cavities.

CT-PT Combined metering Set with Trivector meter

CT-PT combined metering set with Trivector meter shall be provided as per requirements and specifications of JVVNL and Drg No. BIK/WW/01-26

The specific technical parameters of CT and PT shall be as given below.

Sr. No.	Description	Particulars
1	CT	
a	Primary	7.5A
b	Secondary	5A
c	Burden	20VA
d	Class	1.0
2	PT	
a	Primary	33000 V $\sqrt{3}$
b	Secondary	110 V $\sqrt{3}$
c	Burden	20VA
d	Class	1.0

The Trivector meter shall be installed at transformer sub-station yard with

proper mounting and enclosure as per JVVNLs specifications and standards

18.0 Lighting system

Scope

This covers supply, installation and commissioning of all equipment necessary for a complete lighting and receptacle system. The type of lighting fixtures and receptacles shall be as specified. The quantity required shall be as per the approved lighting layout drawings to be submitted by the Bidder. Equipment shall include lighting panels, lighting fixtures, lighting fixture supports, street lighting poles, switches, receptacles, ceiling fans, exhaust fans, conduits, wires, cables, and miscellaneous accessories as necessary for a complete system.

Lighting Fixtures

The lighting fixtures offered shall comply with the following requirements.

The fixtures shall be suitable for operation on a nominal supply of 240 V, single phase, 50 Hz, AC with a voltage variation of + 10 %.

All lighting fixtures shall be supplied complete with lamps and all necessary accessories such as ballast, capacitor, etc. for their satisfactory operation.

Starter of the fluorescent light fixture shall be replaceable without disturbing the reflector or lamps and without the use of any tool.

The capacitor of the lighting fixture shall have adequate value of capacitance to correct the power factor of its fixture to 0.98 lag.

Lamp holders for fluorescent tubes shall be of the spring loaded, low contact resistance, bi-pin rotor type, resistant to wear and suitable for operation at the specified temperature, without deterioration in insulation value, contact resistance or lamp holding quality.

Lamp-holders for HPSV lamps shall be of GLS type, manufactured in accordance with the relevant standard and designed to give long and satisfactory service.

Lighting fixture reflectors shall generally be manufactured from steel or aluminium sheet of not less than 20 SWG thickness.

Polystyrene or aluminium egg-box type louvres shall be provided wherever specified.

Each fixture shall be complete with a four way terminal block for connection and looping of incoming and outgoing cables. Each terminal shall be able to accept two 2.5 mm² copper stranded conductors.

Each lighting fixture shall be provided with an earthing terminal suitable for connecting 16 SWG copper stranded conductor.

All metal or metal enclosed parts of the housing shall be bonded and connected to the earth terminal to ensure satisfactory earthing continuity throughout the fixture.

The enamel finish shall have a minimum thickness of 2 mils for outside surface and 1.5 mils for inside surfaces. The finish shall be non-porous and free from blemishes, blisters, and fading.

All reflectors and louvers shall be finished to the same standard as the fixture housing.

Receptacle units

Decorative and industrial type receptacle units of 5 A, 15/16 A and 32 A

rating with switches/MCBs shall be supplied. The units shall be suitable for mounting flush on GS sheet boxes. Receptacles in the chlorine house shall be of corrosion proof type.

The receptacle shall be suitable for 240 V, 1 Ph, (or 415 V, 3 Ph), 50 Hz AC supply. Single phase decorative receptacle shall be provided with a switch of the same current rating while Single phase industrial receptacle shall be associated with a MCB of the same current rating, housed in the same enclosure. Two phase receptacles shall be associated with a MCB of the same rating, housed in the same enclosure. The enclosure for all outdoor receptacles shall be provided with degree of protection of IP55.

Applicable Standards

All standards and codes of practice referred to below shall be the latest edition including all official amendments and revisions.

Industrial luminaire with metal reflector	:	IS 1777
Ballast for fluorescent lamp	:	IS 1534
3 pin plugs & sockets	:	IS 1293
General safety requirements for luminaires	:	IS 1913
Luminaires for street lighting	:	IS 10322
Fitting for rigid steel conduits for electrical wiring	:	IS 2667
Code of practice for interior illumination	:	IS 3646 & IS 6665
Switches for domestic & similar purposes	:	IS 3854
Electric ceiling type fans & regulator	:	IS 374
Code of practice for electrical wiring installation (system voltage not exceeding 650 Volts)	:	IS 732

Tests and Test Reports

Type tests, acceptance tests and routine tests for the lighting fixtures, accessories and receptacles covered by this specification shall be carried out as per the relevant standard.

Manufacturer's type and routine test certificates shall be submitted for tests conducted as per relevant standards for the fixtures, accessories and receptacles.

The following routine tests shall be conducted as per the relevant Indian Standards.

Each fixture shall be tested at 1500 Volts (rms), 50 Hz, AC for one minute and no flash over or breakdown shall occur between current carrying parts and ground.

Insulation resistance of each fixture shall be tested at 500 V DC and the

insulation resistance so measured shall not be less than 2 megaohms between all current carrying parts and ground.

All luminaires provided with glass covers shall be subjected to thermal shock-proof test. This test shall be conducted to ensure that the cover glass will withstand sudden variation in surface temperature due to rainfall or splashing water when the lighting fixture is lit. The cover glass shall be heated in an oven to attain a steady temperature of 1000 C and then plunged into cold water. No crack should develop.

Bidder shall ensure use of calibrated test equipment having valid calibration test certificates from standard laboratories traceable to National Standards.

Drawings/Documents

The bidder shall furnish with the bid, relevant descriptive and illustrative literature on lighting fixtures, accessories and receptacles as well as preliminary details of lighting panels, conduits, cables, etc.

The following drawings/documents shall be furnished after the award of contract for approval of Engineer's representative.

- a) Dimensional drawings of lighting fixtures
- b) Mounting details, cable entry facility and weights of lighting fixtures
- c) Light distribution diagrams (zonal and isocandela) of lighting fixtures
- d) Utilization factor tables of lighting fixtures
- e) Design calculation for lighting system, lighting and receptacle layout and circuiting diagram
- f) One line diagrams of lighting panels including rating of all equipment

Lighting system Installation

The Bidder shall supply, install, test and commission the complete system of lighting and receptacles in accordance with the approved lighting drawings and documents and in accordance with relevant Indian Standards, codes of practice, Indian Electricity rules and safety codes in the locality where the equipment/system is to be installed. Nothing in this specification shall be construed to relieve the Bidder of this responsibility.

Installation of Lighting Panel, Lighting fixtures & Receptacles

The scope of installation work shall include mounting of lighting panel, lighting fixtures and receptacles at locations as per the approved drawings. All work associated with installation such as providing and fixing of wooden blocks, ball sockets, hooks, etc., as required, drilling holes in walls, ceilings, etc., or any civil work including scaffolding, provision of ladders, etc., together with supply of hardware shall form part of the Bidder's work. All work items necessary for completing earthing connections shall be included in the scope of work.

Wiring

- a) The work shall comprise wiring in heavy gauge (minimum 16 SWG) GI conduits, fixed and supported at intervals of 500 mm on walls, ceiling etc.; installation of light control switches and receptacles housed in GS boxes; earthing with 16 SWG copper wire run along the conduit and clamped to it at every 500 mm; and termination of cables/wires at lighting panels, light control switches, receptacles, lighting fixtures etc., as required. The minimum size of conduit shall be 20 mm. Space factor (ratio of total wire area to internal conduit area) shall be 40 %.

- b) Supply of all the items of work detailed above including 650 V grade, 2.5/4 sq. mm stranded copper conductored PVC insulated cables; 5 / 10 switches; GS conduits and accessories (such as junction boxes, tees, elbows, etc); 16 SWG GS boxes complete with gasket, knockouts for conduit entries, earthing terminal with bolts, nuts and washers; 16 SWG copper earthing wire; flexible conduit etc. shall be included in the Bidder's scope. All work necessary for fixing boxes, conduits etc., together with supply of necessary accessories hardware, shall also be included in the Bidder's work.
- c) All light control switches and receptacle units (connected on the same phase) at one location (such as room entrance), shall be housed in one common GS sheet steel box.

Receptacle and lighting fixtures shall be fed from different circuits and wiring for the same shall be done in different conduits. The maximum load on any circuit shall not exceed 1800 Watts.

In large rooms, the lighting system shall be distributed over two phases.

Switches/receptacles wired on different phases shall be separated by a minimum distance of 1.8 m

Wires belonging to different phases shall not be run in the same conduit. However, more than one circuit on the same phase can be run in the same conduit. For every phase wire, a separate neutral wire shall be run. Neutral wire shall not be looped.

Size of wire chosen shall be such as to limit the voltage drop to within 3 %. Minimum area of conductor shall be 2.5 sq mm stranded copper for lighting and receptacle circuits, and current density shall not exceed 2.5 A/sq mm. Generally, not more than 8 to 10 lighting points shall be wired in one circuit. For calculating connected loads of various circuits, a multiplying factor of 1.25 shall be assumed on the rated lamp wattage for sodium vapour and fluorescent lamp fixtures to take into account the losses in the ballast. A loading of 100 watts and 500 watts shall be assumed for each, single phase 5 amps and 15 amps receptacles respectively.

For street lighting, steel tubular poles complete with fixing brackets shall be used. These poles shall be coated with bituminous preservative paint on the inside as well as on the embedded outside surface. Exposed outside surface shall be painted with one coat of red oxide primer. After completion of installation, two coats of aluminium paint shall be applied. Bidder shall supply and erect the poles (including foundation work), mount the assembled fittings, and install the necessary cabling. The Bidder's scope includes supply and installation of cables required between lighting panel and 14 SWG GS junction box mounted on the street lighting pole and between junction box and metal enclosed control gear box. Bidder shall earth street light pole and junction box with 8 SWG GS wire tapped off from the 8 SWG GS wire to be laid along the street lighting cable. The Bidder shall interconnect this earthing grid to plant main earthing grid. Height and type of pole shall be subject for an engineer's approval.

Before a completed installation is put into service, installation tests stipulated in the latest edition of IS:732 and other codes of practices shall be carried out by the Bidder in the presence of the Engineer's Representative.

19.0 Emergency diesel generator and accessories**Scope**

This covers supply, installation and commissioning of diesel generator (DG) set with accessories of rating 100 KVA, 433 V or required rating is to be provided for emergency power supply. The DG set is to be located in the DG room. The Engine and Generator shall be mounted on a suitable base frame fabricated out of M.S. channels, of welded construction with vibration moments. The generator output shall be connected to the 415 V 3 ph, 4 wire, 50 Hz through proper interlocking system.

Applicable Standards

The design, manufacture and performance of the DG set shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. The equipment shall also conform to the latest applicable Indian and international Standards. In particular, the equipment shall conform to the latest editions of the following standards.

Diesel Engines for General Purposes	:	BS 5514
The Electrical Performance of Rotating Electrical Machinery	:	BS 5000
Rotating Electrical Machines	:	IS 4722
Circuit breakers	:	IS-13118, BS-5311, IEC-56 & 694, BSEN-60942 (P-2)
Air break switches air break disconnectors, air break switch disconnectors and fuse combination units for voltage not exceeding 1000 V AC or 1200 V DC	:	IS-13947 (P-3), BS-EN60947, IEC-60947-3
Current transformer	:	IS-2705/BS-7626, IEC-60185
Voltage transformer	:	IS-3156/BS-7625/IEC 60186
Electrical Relays	:	IS-3231, 3842/BS-142/IEC-60255
Contactors for voltage not exceeding 1000 V ac or 1200 VDC	:	IS-13947 Part-IV/ BSEN-60947-4-1/ IEC-60947-4-1
Control Switches	:	IS-6875/BSEN-60947 / IEC-60947-4-1
High Voltage Fuse	:	IS-9385/BS-2692/ IEC-60282
Low Voltage Fuse	:	IS-13703/BS-1362 IEC-269-1
Electrical direct acting indicating instruments	:	IS-1248/BS-89/IEC-60051
A.C. electricity metres of induction type voltage greater than 1000 volts	:	IS722, 8530/BS-5685 / IEC-60145, 60211
Resistance wire, tapes and stripes for heating elements	:	IS-3725
Wrought aluminium and aluminium alloy bars, rods, tubes and sections for electrical purposes	:	IS-5082
Specification for copper rods and bars for electrical purposes	:	IS-613
Toggle switches	:	IS-3452/BS-3676

Metal enclosed switch gear for voltage above 1000V, but not exceeding 11000V	:	IS-3427/BSEN 602981 / IEC-60298
Specification for low voltage switchgear and control gear	:	IS-13947 /BS-5486,IEC-60947
Degree of protection provided by enclosures for low voltage switchgear and control gear	:	IS-13947(Part I)/IEC-60947-1/BSEN 60529
Marking and arrangement for switchgear, busbars main connection and auxiliary wiring	:	IS-5578 / IS-161.253
Code of practice for selection, installation and maintenance of switchgear & control gear	:	IS-10118
Miniature circuit-breaker	:	IS-8828/BSEN 60898
Control switches/push buttons	:	IS-6875/BSEN 60947

Diesel Engine

The diesel engine shall be of reputed make. The engine shall be water cooled, turbo charged with after cooler and in built radiator suitable for generating-set application having continuous rating at speed not exceeding 1800 rpm, with an overload capacity of 10% for one hour during any 12 hour continuous operation.

Fuel Oil System

Engine fuel oil system shall be complete in all respects but not limited to the following:

Day' tank of capacity 990 litres, with a mechanical oil level indicator and a 'low' oil level signaling device. The fuel tank shall be fabricated out of lead coated steel sheet. The outlet of the tank shall be at a minimum height of 600 mm above the inlet of the fuel injection pump to ensure adequate pressure at the suction of the fuel injection pump. Further the fuel tank shall be provided with sludge & sediment trap, and inspection and cleaning hole, air-vent and draining plug. Adequate supporting arrangement shall be provided for the fuel tank. Also suitable tray shall be provided below the fuel tank for collecting the leakages, overflow etc. The tray shall have draining plug.

Hand operated fuel oil transfer pump to transfer oil from barrels located suitably near the DG room to 'day' tank, along with flexible fuel hoses of adequate length. Suitable hose hanger shall be provided in the DG room to store the hose after use.

One no. duplex filters with differential pressure gauges across the filter.

All piping, valves, fittings and supports required. All MS pipes shall be as per IS:1239 (ERW) CL.HVY. All fittings shall be of forged quality. Valves 50mm and below shall be of forged carbon steel (800lbs) and valves 50mm and above shall be of cast carbon steel (150lbs).

Fuel pump system, injectors etc. mounted on the engine.

Lube Oil System

Lube oil system shall comprise oil pump, strainer, tube-oil cooler, oil filter, bye-pass filter and associated self contained piping.

The lube-oil pump shall be crank shaft driven.

The heat exchanger for cooling lube oil shall be water cooled, shell and tube type, conforming to TEMA-C or approved equal.

Jacket Water Cooling System

The Jacket Water Cooling System shall comprise a radiator engine mounted water pump, thermostat, corrosion resistor and associated self contained piping, etc.

Engine Starting System

The diesel engine shall be electrically started. The starting system shall comprise 24 V d.c batteries of adequate capacity, starter motor, safety relay for the starter and battery charging alternate with in-built regulator. All the related instruments like ammeter, voltmeter, battery charging circuit shall also be provided.

Air Intake and Exhaust System

The air intake and exhaust system shall be provided with :

Air intake manifold with filter

Exhaust gas driven turbocharger

Charged air cooler

Exhaust gas silencer

Exhaust manifold and necessary exhaust pipe, supports and insulation.

The exhaust pipe shall be of adequate length to ensure that the exhaust gases are let out of the building. The exhaust system shall be provided with adequate no.of expansion bellows, Hot insulation for personnel protection.

Governing System

The engine shall have woodward Governor. It shall be capable of regulating the engine speed such that variation in the nominal voltage and frequency shall not exceed $\pm 5\%$ and $\pm 3\%$ respectively.

Tripping Conditions

The diesel engine shall be tripped under the following abnormal conditions:

Over speed of diesel generator set as sensed by over speed trip device;

Low lubricating oil pressure;

High jacket cooling water temperature;

Incomplete start after a preset time;

DC control supply failure;

Low fuel oil tank level;

Excitation failure due to tripping of field breaker or failure to build up voltage; and

Any generator fault

Instruments Panel For Diesel Engine

Instrumentation/indicating gauges shall be provided on the instrument panel for diesel engine, for the following:

Lube oil outlet temperature

Jacket cooling water temperature

Lube oil pressure

Jacket water pressure

Ammeter for battery charging system

Hour meter and RPM indicator

Battery voltage voltmeter

Engine start/stop push buttons.

Generator

The generator shall be of proven make, having rated capacity, of 100 KVA, 415 V, 50 hertz at 0.8 power factor at the rated speed of the prime mover and shall have Class F insulation. The line and neutral ends of each phase winding of the Generator shall be brought out on six suitably located terminals. Suitable cable glands shall be provided on the terminal box to facilitate entry of the above cables. All parts of the generator and accessories shall be designed to withstand all electrical, mechanical and other stresses which may be experienced during operation, including short circuit and over speed conditions.

The generator shall be provided with two (2) grounding terminals with clamps and shall be connected to the main earthing bus.

The excitation system shall be brushless type.

The generator shall have screen protected, drip-proof enclosure with IP-21 protection.

Voltage Regulators

The generator shall be capable of operation over a range of $\pm 5\%$ of the rated voltage;

The voltage drop from no-load to full-load shall not exceed 3%.

The voltage regulator shall be supplied complete with cross current compensation of the static type. The voltage regulator shall be supplied complete with voltage setting device, all accessories and alarm contacts.

Constructional Features

Panels shall be completely metal enclosed, free standing, floor mounting type and shall be dust, moisture and vermin proof. The panel enclosures shall provide a degree of protection not less than IP54.

Panel shall consist of a vertical front panel with equipment mounted thereon and having wiring access from the rear. It shall have double leaf door with lift of hinges. Doors shall have handles with built-in locking facility.

Window type annunciators shall be supplied and mounted on generator control panel to give visual and audible indication for the following conditions,

High jacket cooling water temperature

High lubricating oil temperature

Low lubricating oil pressure

Low fuel oil tank level

Engine over speed and trip

Over current

Earth fault

Contactor on & off indication

Voltage out of limit

Excitation failure

Generator fault

Panel Wiring

Panel shall be supplied completely wired internally to equipment and terminal blocks and ready for external cable connections at the terminal blocks.

All wiring shall be carried out with 650 V grade, single core, stranded copper conductor wires with PVC insulation and shall be flame, vermin and rodent proof. The minimum nominal size of the stranded copper conductor used for panel wiring shall be 2.5 sq.mm

Indicating Instruments

All electrical indicating instruments shall be 110 mm square, with 240 degree scale or of larger size and scale.

Instruments shall have accuracy class of 1.0 or better. The design of the scales shall be such that it can read to a resolution corresponding to 50% of the accuracy class index.

Metering Instruments

Kilo Watthour meter shall be of the two phase two element type of accuracy class 1, suitable for measurement of unbalanced loads in two phase four wire circuits. They shall be suitable for semiflush mounting on vertical panels with only flanges projecting outside with back connected terminals.

Indicating Lamps/Pilot Lights

Indicating lamps and pilot lights shall be panel mounting type with rear terminal connections. Lamps shall be provided with series connected resistors preferably built-in the lamps assembly.

Bulbs and lenses shall be interchangeable and easily replaceable from the front of the panel.

Push Buttons

Push buttons shall be momentary contact type with rear terminal connections. The colour of the push button actuator shall be red for 'STOP' and green for 'OPEN/CLOSE/START'.

Space Heaters

Strip type space heaters of adequate capacity shall be provided inside each panel to prevent moisture condensation on the wiring and panel mounted equipment when the panel is not in operation. Space heaters shall be rated for 240 V, 1 Phase, 50 Hz supply.

A thermostat shall be provided in the heater control circuit to cut-off the heater at 40°C.

Interior Lighting and Receptacles

Panel shall be provided with a fluorescent lighting fixture rated for 240 V, 1 Phase, 50 Hz supply for the interior illumination of the panel during maintenance.

Panel shall be provided with a 240 V, 1 Phase, 50 Hz, 5 Amps, 3 Pin receptacle with switch.

Earthing

Panels shall be provided with a copper earth bus bar of size 50 x 6 mm

along entire length of panel for connecting earthing grid at two points.

Interlocking Arrangement

When normal power supply is available at the 415 volt power control centre bus, it shall not be possible to switch on the circuit breaker or power contactor in the Generator control panel.

When the circuit breaker or power contactor for the DG output is closed, it shall not be possible to switch-on the MCCB for the normal power supply.

The above interlocking shall be such as to eliminate the risk of human error totally.

Interlocking arrangement shall be made as per single line diagram BIK/WW/01-26.

Performance Requirements

The diesel generator and accessories shall be so designed as to meet the following performance,

The unit shall be capable of starting from cold condition, reaching operating speed and taking up load within the shortest possible period.

The unit shall be capable of delivering continuously at the generator terminals a net output specified. This net output shall be obtained after necessary derating of engine due to site conditions and unit auxiliary power requirements have been taken into consideration.

The unit shall be capable of a peak output of 10% in excess of the rated output for a period of one hour out of a total of twelve consecutive hours of operation, without exceeding permissible temperature limits and with a fairly visible exhaust.

The unit shall be continuously rated to supply power for long periods.

The following items of performance shall be guaranteed during site tests by the Supplier in respect of the diesel generator and the auxiliary specified site condition

Net electrical output

Fuel oil consumption at $\frac{1}{2}$, $\frac{3}{4}$, and full load

Jacket water temperature to and from engine

Lubricating oil temperature to and from engine

10% overload for 1 hour out of a total of twelve consecutive hours of operation without overheating or showing signs of undue stress and within specified frequency variation

Freedom from vibration and noise

Governor response, over speed trip and speed gear capability

Voltage regulator response

Excitation at full load and under specified variation of voltage and speed

Acoustic Requirements

The emergency generator set shall be provided with

- a) Fan exhaust silencers
- b) Air intake silencers, and
- c) Engine's exhaust primary and secondary silencers

The design shall aim that the noise level at the nearest property boundary due to the generator set operation will not exceed 55dBA. The noise level at a distance not greater than 1.5m away from the generator set room shall not exceed 70dBA.

Anti-vibration pads

The engine shall be provided with adequate number of anchor bolts, foundation bolts and antivibration pads. Alignment shims, as required shall also be provided.

Drawings And Data

The Tenderer shall furnish the following drawings/data in the Technical Bid.

Control panel dimensions and drawing showing plan, front view, foundation details, inside view, terminal block location etc.

Schematic diagrams of the electrical circuitry.

General arrangement of the complete DG Set.

Testing and Commissioning

The Bidder shall perform all standard shop test to ensure that the equipment conforms to the specifications and meet the performance guarantee. All test for satisfactory operation of D.G. Set shall be performed as per applicable code of practice. Bidder shall ensure to use calibrated test equipment having valid calibration test certificates from standard laboratories traceable to National Standards.

INSTRUMENTATION & CONTROL SYSTEM

1.0 Design requirements

- a) I&C system shall be designed, manufactured, installed and tested to ensure the high standards of operational reliability. Instruments mounted in field and on panels shall be suitable for continuous operation. All electronic components shall be adequately rated and circuits shall be designed so that change of component characteristics shall not affect plant operation.
- b) All I&C equipment shall be suitable for continuous operation. Unless otherwise specified, all instruments shall be tropicalised. The Tenderer's equipment shall be designed to withstand tropical rain. Wherever necessary, space heaters, dust and water proof cabinets shall be provided. Instruments offered shall be complete with all the necessary mounting accessories.
- c) Electronic instruments shall utilize solid state electronic components, integrated circuits, microprocessors, etc., and shall be of proven design.
- d) All digital outputs from the instruments shall be volt free. The relay/switch contacts shall be rated for the voltage of the circuit in which they are to be wired.
- e) All analogue displays shall be of the digital type with no moving parts utilizing back-lit liquid crystal diode (LCD)/ LCD technology.
- f) For transmitting instruments, output signal shall be 4-20 mA DC linear having two wire system.
- g) Unless otherwise stated, overall accuracy of all measurement systems shall be $\pm 1\%$ of measured value, and repeatability shall be $\pm 0.5\%$.
- h) Unless otherwise specified, the normal working range of all indicating instruments shall be between 30% and 80% of the full scale range.
- i) After a power failure, when power supply resumes, the instruments and

associated equipment shall start working automatically.

- j) The instruments shall be designed to permit maximum interchangeability of parts and ease of access during inspection and maintenance.
- k) The field instruments i.e. the instruments mounted outside the control panel shall be mounted at a convenient height of approximately 1.2 meters above grade platform.
- l) Unless otherwise stated, field mounted electrical and electronic instruments shall be weatherproof to IP-65 of IS 13947 Part I. All instruments of submersible type shall be protected to IP-68 of IS-13947 Part I.
- m) The instruments shall be designed to work at the ambient conditions of temperature, humidity, dust and chlorine contamination that may prevail. The instruments shall be given enough protection against corrosion and all the wetted parts of the instruments shall be non-corrosive.
- n) Lockable enclosure shall be provided for all the field mounted instruments.
- o) All field instruments, and cabinets/panel mounted instruments shall have tag plates/name plates permanently attached to them.
- p) The performance of all instruments shall be unaffected for the $\pm 10\%$ variation in supply voltage and $\pm 5\%$ variation in frequency simultaneously.
- q) Unless otherwise specified, double compression glands shall be used for glanding the cable in field instruments and instrument control panel.
- r) Zero and span adjustments shall be provided for all instruments.
- s) All electrical and electronic systems and all associated software systems supplied under this contract shall conform with Year 2000 conformity requirements.

2.0 Level measuring system

Ultrasonic Type Level Measurement

- a) Ultrasonic type level measuring devices shall comprise of a transducer, a transmitter, remote level indicator and all other items required for the complete control system.
- b) The transducer shall be suitable for flange or bracket mounting as required. It shall have ambient temperature compensation and adjustable datum setting facilities.
- c) The design and application of this ultrasonic level meters shall take into account the vessel or channel construction, the material size, shape, environment, process fluid or material, the presence of foam, granules, size etc.
- d) The installation shall avoid any degradation of performance from spurious reflections, absorption, sound velocity variations, sensor detection area, temperature fluctuations, specific gravity changes and condensation. For application where spurious reflections are unavoidable the control unit shall be provided with facilities for spurious reflection rejection.
- e) The structure required for supporting the level sensor, platform, railings etc. shall be in the Bidder's scope.
- f) If turbulence exists, shielding, stilling tubes or other measures shall be provided to avoid effects on the measurement. To remove the effect of water turbulence averaging facility should be provided in the transmitter unit.
- g) Technical Particulars

i. General

- | | | | |
|----|--------------------------------------|---|---|
| 1) | Service | : | Levels in wet well of STPs and SBR reactor. |
| 2) | Quantity | : | One lot |
| 3) | Range | : | 0 – 12 metres |
| 4) | Overall Accuracy of measurement loop | : | $\pm 0.5\%$ of measured value |
| 5) | Temperature compensation | : | Required |

i. Level Sensor / Transmitter

- | | | | |
|----|--|---|---|
| 1) | Weather protection | : | IP-65 of IS-13947 Part-1 |
| 2) | Mounting | : | Field, on top of STPs wet well and on STPs reactors chlorination tanks. |
| 3) | Type | : | Indicating type having back-lit LCD / LCD display. |
| 4) | Output signal | : | 4 – 20 mA DC (Isolated) |
| 5) | Power Supply | : | 24 V DC |
| 6) | Programming facility with programmer | : | Required |
| 7) | Prefabricated integral cable for connecting sensor and transmitter | : | Required |

iii. Digital Level Indicator

Refer technical particulars of digital panel meters.

Float Type Level Switches

a) Float type level switches shall be provided for detection of high high and low low levels in the wet well. The level switches shall have top mounting arrangement with IP-68 weather protection class. The level switch shall have 2 NO + 2 NC contacts rated for 230 V AC, 2A.

b) Technical Particulars

i. General

1) Service : High High and Low Low level detection in wet well of STPs

2) Range : 0 - 12 Metres

3) Repeatability : $\pm 0.1\%$ or better

ii. Float

1) Mounting : Field, on top of STPs wet well, Flanged

2) Flange : ANSI B16.5, 150 LBS, SS316

3) Material of float : Polypropylene / SS316

4) Cable Material : Suitable for sewage application

5) Counter weight (Ballast)/ support pipe for clamping cable : Required to ensure stable vertical position of the float

6) Float installation hardware material : SS 316

7) Switch type : Micro switch (Mercury type not acceptable)

iii. Electronic Unit

- | | | | |
|----|-----------------------------|---|-------------------------------|
| 1) | Output | : | 2 NO + 2 NC
contact |
| 2) | Contact rating | : | 240 V AC, 2 A |
| 3) | Power Supply | : | 24 V DC |
| 4) | Weather protection
class | : | IP-55 of IS-13947
(Part I) |

3.0 Pressure gauges

- a) Pressure gauges shall comply with IS 3624/ BS 1780. For especially arduous duty where the gauge is subject to pressure pulsations and/or vibration, it shall be provided with a glycerin filled dial.
- b) The internal parts of pressure gauge shall be of stainless steel material. When necessary a diaphragm seal shall be used to segregate the internal parts from the corrosive fluid media.
- c) The accuracy of pressure gauges shall be $\pm 1\%$ over the operating range. The zero and span of pressure gauge shall not change by more than $\pm 0.1\%$ of the span per $^{\circ}\text{C}$ changes in ambient temperature. The gauges shall be of precision type.
- d) Technical Particulars
- | | | | |
|----|-----------------------|---|--|
| 1) | Service | : | Suction and discharge of sewage pumps, air blower lines, chlorine motive water pumps chlorine dosing lines, etc. |
| 2) | Type | : | Bourdon |
| 3) | Accuracy | : | $\pm 1\%$ of full scale |
| 4) | Dial size | : | 150 mm |
| 5) | Glass | : | Shatterproof |
| 6) | Over range protection | : | 25% above maximum pressure |
| 7) | Diaphragm seal | : | Required |
| 8) | Diaphragm Material | : | SS 316 |

9)	Other Wetted Parts	:	SS 316
10)	Process Connection	:	Flanged, SS 316, ANSI B 16.5
11)	Accessories	:	Snubbers, isolation valve & drain valve Impulse tubing and fittings

4.0 Cabinets for field instruments

- a) A Cabinet shall be provided for enclosing instruments and associated accessories which are mounted outside the control panel such as transmitters, SPDs, terminal blocks etc. at all measurement locations. The cabinets for electronic indicating instruments like transmitters, flow computing units etc. mounted outside the control panel shall be provided with proper sunshade.
- b) It shall be fabricated from cold rolled steel with powder coating sheet of standard gauge and shall be suitable for wall mounting or pedestal mounting as required.
- c) The cabinet shall be properly painted from inside by white paint and from outside by paint shade RAL 7032.
- d) The cabinet shall conform to IP-65 protection and shall have built in locking facility. The cabinet shall be earthed properly. A steel plate/pipe, as per the requirement, shall be provided in the cabinet for mounting the instrument and accessories.

5.0 Digital panel meters (digital indicators)

- a) Digital Panel Meters (DPM) shall be microprocessor based and modular in design. They shall accept 4-20 mA DC signals from transmitters. The DPMs shall provide an output of 4-20 mA DC proportional to input signal for re-transmitting. The DPMs shall have back-lit LCD/LCD display.
- b) Technical Particulars

1)	Type	:	Microprocessor based
2)	Display	:	Digital, 7 segment back-lit LCD / LCD display
3)	Digit Height	:	14 mm or higher
4)	No. of Digits	:	4 Digits.
5)	Input (Refer Note-2)	:	4-20 mA DC (Isolated) from level transmitter

6)	Power Supply	:	24 V DC
7)	Zero & Span Adjustment	:	Required
8)	Engineering Units for display Level Indicators	:	Metres
9)	Accuracy	:	±0.1 % of span
10)	Enclosure Material	:	Die cast aluminum
11)	Enclosure Protection Class	:	IP-52 of IS-13947 Part-I
12)	Retransmission output	:	4-20 mA
13)	Alarm outputs	:	2 NO+ 2NC for high and low alarms (adjustable)

Note :

1. All digital panel meters shall provide 24 V DC power supply to respective transmitters in case the transmitters have two wire system.
2. Analog signal multiplier shall be used in the Instrumentation Control Panel for multiplication of the signal from the STP wet well ultrasonic level transmitter. One output of the analog signal multiplier shall be wired to the digital panel meter and the other output shall be wired to the Programmable Logic Controller (PLC).

6.0 Microprocessor based alarm annunciator

Alarm Annunciator for STP

- a) Microprocessor based alarm annunciators shall be provided for generating audio visual alarms for each abnormal condition. Alarms shall be initiated by the opening and closing of volt-free contacts which shall remain unchanged throughout the period in which the alarm conditions exist. Alarm circuits shall be capable of conversion from open-healthy to open-alarm or vice versa by a simple modification after installation requiring no additional parts or special equipment. Each alarm shall initiate the operation of both visual and audible devices. The sound intensity of each audible device shall be suitable for the maximum sound level of its environment.
- b) The operation or acceptance of one alarm shall not inhibit the operation of the audible device or the flashing of the appropriate alarm indicator if a future alarm condition occurs.

- c) Alarm circuitry shall be arranged so that spurious or transient alarm states persisting for less than 0.5 seconds do not initiate any action.
- d) Isolation facilities shall be provided for the hooter.
- e) Technical Particulars
General

1)	Type	:	Microprocessor based, split type with alarm windows mounted on front facia of panel and electronic modules inside the panel.
2)	Mounting	:	On the front facia of the Instrument Control Panel (ICP).
3)	Type of contacts	:	Potential free NO/NC
4)	Power Supply	:	24 V DC
5)	Hooter	:	Required with isolation switch
6)	No. of spare windows	:	20%
7)	No. of bulbs per window	:	2 nos. comprising of cluster of LEDs.
8)	Type of sequence	:	First up
9)	Window colour	:	Transparent glass
10)	Push buttons	:	Test, accept and reset

f) Alarm Schedule

The following alarms shall be annunciated on the alarm annunciator:

- i. STPs wet well level high high.
- ii. STPs wet well level low low.
- iii. Sewage pump #1 overload trip/fail to start.
- iv. Sewage pump #2 overload trip/ fail to start.
- v. Sewage pump #3 overload trip/ fail to start

- vi. Sewage pump #4 overload trip/ fail to start.
- vii. Sewage pump #5 overload trip/ fail to start
- viii. Sewage pumps in manual mode.
- ix. Motorised valve MV#1 in discharge of pump#1 failed to operate.
- x. Motorised valves MV#1 in discharge of pump#1 in local mode.
- xi. Motorised valve MV#2 in discharge of pump#2 failed to operate.
- xii. Motorised valves MV#2 in discharge of pump#2 in local mode.
- xiii. Motorised valve MV#3 in discharge of pump#3 failed to operate.
- xiv. Motorised valves MV#3 in discharge of pump#3 in local mode.
- xv. Motorised valve MV#4 in discharge of pump#3 failed to operate.
- xvi. Motorised valves MV#4 in discharge of pump#3 in local mode.
- xvii. Motorised valve MV#5 in discharge of pump#3 failed to operate.
- xviii. Motorised valves MV#5 in discharge of pump#3 in local mode.
- xix. MCBs tripped.
- xx. Pump start sequence failed to complete.
- xxi. Pump stop sequence failed to complete.
- xxii. STP Screen control panel fault.
- xxiii. Differential pressure across STP screen high.
- xxiv. Mains power supply fail.
- xxv. Battery & Battery Charger Panel fault.
- xxvi. Ultrasonic level transmitter fault.
- xxvii. Float level switches fault.
- xxviii. Incomer fault.

Notes:

1. The alarm schedule is indicative of what is required. The Bidder shall provide for the annunciation of all alarms necessary in order to achieve control and monitoring requirements.
2. For digital signals which have to be wired to alarm annunciator as well as to PLC, multiplication relays (with minimum 2NO + 2NC potential free contacts) shall be provided for multiplying the digital signals. Potential free contacts of the multiplication relays shall be wired to the alarm annunciator and to the PLC.

7.0 Alarm Annunciator for STP

An alarm annunciation system shall also be provided for STP. This shall be design as per the process requirement for indicating all likely failure

8.0 Instrument power supply cables and instrumentation signal cables

- a) Bidder shall include in his scope the supply and laying, of instrumentation signal & instrument power supply cables and associated civil / mechanical work required for completing the system.

- b) Cables shall be capable of satisfactorily withstanding without damage, transportation to site, installation at site, and operation under normal and short circuit conditions of the various systems to which the respective cables are connected when operating under the climatic conditions prevailing at the site as indicated in this specification. Cables shall be capable of operating satisfactorily under a power supply system voltage variation of $\pm 15\%$, and frequency variation of $\pm 5\%$.
- c) Cable joints in instrument signals and instrument power supply cables shall not be permitted.
- d) Cables shall be directly laid on trays, in trenches, conduits, ducts and directly buried in the ground as necessary.
- e) The Bidder shall also supply the necessary materials such as junction boxes, glands, lugs etc required for termination of cables.
- f) Technical Particulars
- i. Cables for Digital Signals (D.C.) and D.C. Power Supply to Instruments
660V/1100 V grade multicore cables, multistranded high conductivity annealed 1.0 sq.mm. stranded tinned copper conductor, extruded PVC insulated, overall shielded with aluminium mylar tape, ATC drain wire run continuously in contact with aluminium tape, inner sheathed with extruded PVC, armoured with galvanised steel wire overall sheathed with extruded PVC conforming to IS: 1554 & IEC: 189 Part II.
- ii. Cables for analog signals
660 V/1100 V annealed, tinned, high conductivity 1.0 sq.mm stranded copper conductor extruded PVC insulated two cores twisted into pair, laid up collectively, individual pair shielded and overall shielded with aluminium mylar tape, ATC drain wire run continuously in contact with aluminium side of the tape, inner sheathed with extruded PVC, armoured with galvanised steel wire, overall sheathed with extruded PVC conforming to IS: 1554 & IEC: 189 Part II.

9.0 Power supply cables

Cables shall be rated for 1100 V and shall conform to the latest edition of IS: 1554. Cable shall be insulated with extruded PVC type 'A'. The inner sheath over laid up covers and outer sheath over the armour shall be of extruded PVC compound type

ST-1. 230 V AC power supply cable for panel shall be of 2.5 sq.mm stranded, tinned, annealed copper conductor. 24 V DC power supply cable for the panel shall be of 25 sq.mm stranded, tinned, annealed copper conductor.

10.0 Laying of cables

- a) A distance of minimum 300mm shall be maintained between the cables carrying low voltage AC and DC signals and a distance of minimum 600mm shall be maintained between cables carrying HT and LT signals. Each instrumentation and power supply cable shall be terminated to individual panel/ terminal box. Identification of each cable shall be by proper ferrules at each junction as per cable schedule to be prepared by Bidder.
- b) Cables shall be laid in accordance with layout drawings and cable schedule which shall be prepared by Bidder and submitted for Engineer's Representative's approval.
- c) All cable routes shall be carefully measured and cables cut to the required lengths, leaving sufficient amount for the final connection of the cable to the terminals on either end. Various cable lengths cut from the cable reels shall be

carefully selected to prevent undue wastage of cables. A loop of 1 metre shall be left near each field instrument before terminating the cable.

- d) Cables shall be complete uncut lengths from one termination to the other.
- e) All cables shall be identified close to their termination point by cable numbers as per cable interconnection schedules. Identification tags shall be securely fastened to the cables at both the ends.
- f) Cable shall be rigidly supported on structural steel and masonry, using individually cast or malleable iron galvanized clips, multiple cable supports or cable trays.
- g) The Bidder shall take the actual measurement of the cables and the associated accessories such as cable trays, conduits etc required at site, prior to the placement of order on the cables.

11.0 Junction boxes

- a) In order to make the most economic use of cable ladder/tray and duct capacity, multicore cabling shall be utilised in order to connect instrumentation groups by using suitably located sub-distribution junction boxes.
- b) The junction boxes shall have weather protection suitable for the area in which they are to be installed and for the type of circuit. They shall be readily accessible for maintenance and clearly labeled. Junction boxes shall be constructed of die cast aluminium and provide degree of protection IP 65.
- c) Separate cables shall be used for digital and analog signals.
- d) Wires and terminals for the digital and analog signals shall be segregated within junction boxes. Also wires and terminals for AC and DC signals shall be segregated within the junction boxes.

12.0 Control panels

- a) General
 - i. Control Panels shall be machine prefabricated out of CRCA sheet steel of thickness not less than 2 mm, modular in construction, properly reinforced, powder coated and having rigid frame structure. Internal mounting plate including the gland plate shall be 3 mm thick. The panel shall have dimensions as per system requirement. However, the panel height shall not exceed 2200 mm.
 - ii. The exterior corners and edges shall be rounded to give a smooth overall appearance with projections kept to a minimum.
 - iii. Lifting lugs shall be provided for installation purposes and shall be replaced with corrosion resistant bolts after installation.
 - iv. Panel shall be completely metal enclosed and shall be dust, moisture and vermin proof. Panel enclosure shall provide a degree of protection of IP 54 in accordance with IS: 13947 Part-I.
 - v. There shall be sufficient reinforcement to provide level surfaces, resistance to vibrations and rigidity during transportation and installation.
 - vi. Metal sills in the form of metal channels properly drilled shall be furnished along with anchor bolts and necessary hardware for mounting the panels. These shall be dispatched in advance so that they may be installed and leveled when concrete foundations are poured.
 - vii. Cable entries to the panels shall be from the bottom with fire retardant spray compound sealing. Panel shall be provided with louvers along with S.S. wire mesh if required.

- b) Mounting
 - i. All equipment on front of panel shall be mounted flush or semi-flush. In case of semi-flush mounting, only flange or bezel shall be visible from the front.
 - ii. Equipment shall be mounted such that removal and replacement can be accomplished individually without interruption of service to adjacent equipment.
 - iii. Equipment mounted inside the panel shall be so located that terminals and adjacent devices are readily accessible without the use of special tools. Terminal markings shall be clearly visible.
 - iv. Cut-outs and wiring for free issue items, if any, shall be according to corresponding equipment manufacturer's drawing. Cut-outs, if any, provided for future mounting of equipment shall be properly blanked-off.
 - v. The panel shall be matched with other panels in the control room in respect of dimensions, colour, appearance and arrangement of equipment on the front.
- c) Earthing for Instruments
 - i. The panel shall be equipped with an instrument earth bus securely fixed along the inside base of panel.
 - ii. All metallic cases of relays, instruments and other panel mounted equipment and cable shields, shall be connected to the instrument earth bus.
 - iii. Looping of earth connections which would result in loss of earth connection to other devices when the loop is broken shall not be permitted. However, looping of earth connections between equipment to create alternative paths to earth bus shall be provided.
 - iv. Earth for instruments shall be separate from electrical station earth.
- d) Frame Earthing

All metal parts other than those forming part of an electrical circuit shall be connected to a copper earth bar run along the inside bottom of the panel. The minimum section of the earth bar shall be 25 mm x 3 mm. Connection of the earth bar to the station earth shall be carried out by Bidder.
- e) Space Heater

Strip type space heaters of adequate capacity shall be provided inside control panels to prevent moisture condensation on the wiring and panel mounted equipment when the panel is not in operation. The heaters shall operate on 230 V AC. Heaters inside the panels shall not be mounted close to the wiring or any panel mounted equipment. The operation of heaters shall be controlled by thermostats.
- f) Interior Lighting and Receptacles
 - i. The panel shall be provided with either a fluorescent or filament lighting fixture rated for 20 watt, 230V, 1 phase, 50 Hz supply for the interior illumination of the panel during maintenance. The illumination lamp shall be operated by door switch or manual switch.
 - ii. The panel shall be provided with 230V, 1 phase, 50 Hz, combined 5 amps and 15 amps, 3 pin receptacle with a switch and neon indicating. The receptacle with switch shall be mounted inside the panel at a convenient location.
- g) Voltage Level and Power Supply Units

Generally, voltage levels for control schemes and power supply for instruments, shall be limited to 24 V DC.
- h) Labels

All the equipment mounted on the front facia of the panel as well as equipment mounted inside the panel shall be provided with individual labels with equipment designation engraved. The labels shall be mounted directly below the respective equipment. Also the panel shall be provided at the top with a label engraved with panel designation.

i) Switches and Miniature Circuit Breakers (MCBs)

Each panel shall be provided with necessary arrangement for receiving, distributing, isolating and protecting of DC and AC supplies for various control, signaling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with two pole Miniature Circuit Breakers (MCBs). Potential circuits for relaying and metering also shall be protected by MCBs.

j) Intra-panel (i.e. Panel Internal) Wiring

i. Connections within a panel, between panel mounted devices and terminal blocks or between two panel mounted devices will be made by 660 volt grade, stranded copper conductor insulated with PVC and designed for a minimum conductor temperature of 90 degrees centigrade. The wires shall be shielded, where necessary.

ii. Panel shall be supplied completely wired internally, with a colour coding scheme decided mutually between the Purchaser and the Bidder, to equipment and terminal blocks and ready for external cable connections at the terminal blocks.

iii. Wires within the panel shall be continuous i.e. without splicing and shall comprise stranded copper conductors. Internal wiring or wiring between the two assemblies shall be commensurate with mechanical safety.

iv. Wire termination shall be made with solderless crimping type of tinned copper lugs which firmly grip the conductor and insulation. Insulated sleeves shall be provided at all the wire terminations. Engraved core identification plastic ferrules, marked to correspond with panel wiring diagram shall be fitted at both ends of each wire. Ferrules shall fit tightly on the wires and shall not fall off when the wire is disconnected from terminal blocks.

k) Terminal Blocks

i. Terminal blocks shall be 660V grade, 20 amps rated, one-piece moulded, complete with stud type terminals, washers, nuts and lock nuts and identification markings. Terminal block design shall include a white fibre marking strip with clear plastic, hinged terminal covers. Markings on the terminal strips shall correspond to wire numbers on the wiring diagrams.

ii. All spare contacts and terminals of the panel mounted equipment and devices shall be wired to terminal blocks.

iii. There shall be a minimum clearance of 250 mm between the first row of terminal blocks and the associated cable gland plate. Also the clearance between two rows of terminal blocks shall be a minimum 250 mm.

iv. Panel internal wiring shall not be looped directly from instrument to instrument. The same shall be looped through the panel terminal block only.

v. If accidental short circuiting of certain wires is likely to result in malfunction of equipment, such as closing or tripping of a breaker or positive and negative wires, these wires shall not be terminated on adjacent terminal blocks.

l) Cable Supports

All external cables shall present a neat appearance and shall be suitably braced, placed in troughing clipped or laced to prevent effects of vibration.

m) Terminal/Identification

Every terminal and test plug shall be uniquely identified within the terminal cabinet by means of a terminal number. Appropriate labels shall be used to permit quick and unambiguous identification of each terminal and test plug.

n) Painting of Panel

All sheet steel work shall be phosphated in accordance with the following procedure :

- i. Oil, grease, dirt and swarf shall be thoroughly removed by emulsion cleaning.
- ii. Rust and scale shall be removed by trickling with clean water followed by final rinsing with dilute dichromate solution.
- iii. The panel shall be powder coated. Thickness of coating shall be of minimum 60 microns. QA test certificate shall be furnished for thickness adhesion and hardening of powder coating.

o) Technical Particulars

i. General

- | | | | |
|----|------------------------------|---|--|
| 1) | Service | : | Sewage Pumping Station |
| 2) | Type | : | Free standing type |
| 3) | Construction | : | Prefabricated and modular construction |
| 4) | Sheet Material | : | Cold rolled sheet steel |
| 5) | Panel Protection class | : | As per IP-54 of IS-13947 Part-I |
| 6) | Internal Lighting | : | Required |
| 7) | Cable Entry | : | From bottom |
| 8) | Access | : | Rear |
| 9) | External Colour of the panel | : | RAL 7032 |

i. The ICP shall provide separate areas for the PLC, internal power distribution, field cabling termination and for surge protection devices. A separate instrumentation earth bar mounted on insulating supports (a 'clean' earth) shall be provided within the ICP. Instrumentation and control cable screens shall be connected to this earth.

- ii. The following instruments shall be mounted on front facia of the ICP:

- Digital indicator for STPs wet well level.
- Auto/manual selector switch for selection of mode of operation of the sewage pumps.
- Cluster LED type indicating lamps shall be provided for auto and manual mode selection of the control system.
- 5-position selector switch for selection of duty and standby pumps.
- Pushbuttons for the following:
 - Start and stop of the sewage pumps.
 - Open and close of the motorised valve in the discharge of each of the sewage pumps.
 - A common shrouded mushroom type emergency stop pushbutton for emergency system stop.

iii. Mimic

Mimic diagrams shall be provided on the ICP showing a full colour display of the process and status of the valves, pumps, faults etc. The mimic sheets of 3 mm thickness shall be screwed on to panels and shall be made of anodized aluminum or plastic material with screen printing and laminated which can be easily cleaned and shall be of approved colour. Cluster type LEDs shall be used for indicating ON/OFF/Trip and Open/Close status of equipment. For status of equipment to be wired to mimic and to PLC, multiplication relays (with minimum 2NO + 2 NC potential free contacts) shall be provided. Potential free contacts of the relays shall be wired to the mimic and to PLC.

iv. Alarm annunciator along with test, reset and accept pushbuttons.

v. Hooter.

i. The panel shall be provided with necessary arrangement for receiving, distributing, isolating and protecting of DC and AC supplies for various control, signaling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with double pole Miniature Circuit Breakers (MCBs). All MCBs except those used for panel heaters and panel illumination shall be provided with additional potential free contacts for connecting the same to alarm annunciator for generating MCB trip alarm.

vi. Control System

- p) The STP control system shall be based on the use of a Programmable Logic Controller (PLC). The control system shall be designed for fully automatic operation of the pumping system. The Bidder shall size the PLC, memory, inputs/outputs considering the requirements of the STPs. Manual mode of operation shall be independent of the PLC. In the event of failure of the automatic controls or by operator choice it shall be possible to operate each item of the STPs independently of the PLC function.

At present the control logic will be based on timer basis of pump operation for peak, average and minimum flow hour basis for weak days and a separate time schedule cycle for Sunday and holidays.

- q) The STPs control system shall be designed to recover fully to a normal operational state on restoration of power following a power failure without manual intervention.

13.0 Programmable logic controller (plc)

General

- i. The design, material, construction features, manufacture, inspection and testing of Programmable Logic Controller (PLC) shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. The equipment shall comply with the latest applicable standards and codes. If any such standards are not applicable then the same shall comply with the applicable recommendations of professional institutes like NEMA, IEC, ANSI, ISA, IEEE, DIN, VDE.
- ii. The PLC shall be provided as a standalone controller to perform logic functions and status monitoring.
- iii. The PLC shall be microprocessor based with semiconductor ICs and solid state components with state of the art technology. System components shall be carefully chosen so that the reliability and availability of the system shall be high. It shall be possible to replace the faulty cards or modules on-line, without causing any disturbance to PLC system/ process. The PLC shall use standard bus protocols and structures for communication within and outside.
- iv. The central processing units (CPU) shall be high performance processors with modular configuration suitable for real time process applications. Inherent reliability, self-checking, error- recovery and trouble isolating features shall be some of the features of the CPU. Automatic restart of the system on resumption of power shall be provided.
- v. Standard rack mounted I/O modules with plug-in cards shall be provided. Field wiring shall be terminated in screwed terminal blocks
- vi. The digital output modules shall provide contact closure output by driving relays. The supply of the input and output relays driven by PLC shall be supervised.
- vii. PLC shall be suitable for ambient temperature conditions (upto 50°C), dust in atmosphere and humidity condition existing at site during monsoon.
- viii. It shall be possible to perform the simulation functions and testing the program by changing the status of contacts and monitoring the output.
- ix. The on-line operating system shall be proven and shall be able to support all the equipment.
- x. In case of system failure or power supply failure all the outputs shall attain pre-determined fail safe condition. Spurious signals shall not cause equipment operation. Check back before execution features shall be incorporated.
- xi. Some of the common features of the I/O modules shall be as follows:
 - All inputs shall be terminated with input protective network and necessary isolating barriers.
 - Filters for noise rejection.
 - Provision for isolation of faulty channels.
 - Test points and fault indication LEDs shall be provided to carry out module testing.
 - Surge withstanding facility as per IEEE standards.
 - All the modules shall be of addressable type.
 - Protection for continuous overload up to 200% of all input ranges.
 - Fuse protection and fuse failure detection.
 - Internal battery backup.

PLC Hardware and Software

- i. The PLC programming shall be prepared using the PLC manufacturers recommended windows based PLC coding and documentation software. The PLC code shall be structured in the manner of the best industry standard and have comprehensive subroutine and rung annotation.
- ii. The PLC shall be commissioned using RAM memory storage modules which shall be replaced with an EPROM or EEPROM when testing is complete.

Technical Particulars

1)	Service	:	Sewage pumping station (STPs) controls
2)	Functions	:	As per the control logic and Input/ Output lists for PLC
3)	Software	:	To perform all the functions mentioned in the control logic and write-up.
4)	Expandability	:	20% of installed capacity
5)	Interposing relays	:	Shall be provided for all the digital outputs (DO) including spare DO and for digital inputs wherever required.
6)	Optical isolation for all digital inputs and outputs and galvanic isolation for analog inputs	:	Required
7)	Processor		
	Diagnostic function performance	:	Required
	Minimum 16 bit performance with floating point capability	:	Required
	Memory module	:	
			To store programs, standard software to perform logic functions and diagnostic functions

8)	Mounting	:	Inside the instrument control panel (ICP)
9)	Inputs and outputs	:	As per I/O list
10)	System loading	:	Max. 60% under worst loading conditions.
11)	Type of input	:	NO/NC – contacts field selectable
12)	Output	:	Relay outputs for driving MCC starter coils, motorised valves etc.
13)	Spare I/Os	:	20% of each type, wired to terminal block.
14)	Accessories	:	Programming software to be loaded in Purchaser's PC along with communication cable.

The digital input & digital output modules shall not have more than 16 channels in each module. The analog input modules shall not have more than 8 channels in each module.

14.0 Interlocking

Hard wired interlocking shall be provided for safety circuits such as:

- i. Moisture detection in oil chamber of pump.
- ii. Run dry protection.
- iii. Single phasing and overload.
- iv. High motor winding temperature of motor.
- v. Emergency stop circuitry.

In addition drives stopped as a result of the action of hardwired interlocks shall in additionally have a fault signal conveyed to the ICP in order that the PLC drive 'run' output is removed.

Soft wired interlocking is provided by the PLC for process control and for safety trips when the signal is derived from a remote source (e.g. stopping of the pumps as a result of a low level in the wet well).

15.0 Control philosophy

The working pumps shall be manually selected at the ICP through selector switch.

A Programmable Logic Controller (PLC) based control system shall be provided for automatic operation of pumping station. The Bidder shall size the PLC, memory, inputs/outputs considering the requirements of the STPs. In event of failure of automatic controls or by operator choice it shall be possible to operate the sewage

pumping station independently of the PLC function.

The STPs control system shall be designed to recover fully to a normal operational state on restoration of power following a power failure without manual intervention.

Control System

i. Control Modes

The auto/manual mode shall be selected at the Instrument Control Panel (ICP) using selector switch.

- Automatic Control Mode :

⇒ Pump Start Routine

The pump automatic mode start routine shall be as follows:

► Permissive conditions to start

- ☐ Auto/Manual selector switch is in auto mode
- ☐ Discharge valve is closed
- ☐ Discharge valve available
- ☐ Pump drive available
- ☐ Wet well level 'Not Low'.

► Start sequence

- ☐ When above permissive conditions are satisfied, the pump shall be started and the corresponding discharge valve shall be opened.
- ☐ If the discharge valve fails to open in 90 secs or the pump fails to start/ trips, the pump shall be stopped, the discharge valve shall be closed, the standby pump shall be started and the corresponding discharge valve shall be opened. Alarms shall be generated for pump 'Failed to start/trip' and discharge valve 'Failed to operate'.
- ☐ When pump starts and discharge valve opens, the start sequence is completed.
- ☐ There shall be time delay of 180 seconds between starting of any 2 pumps.
- ☐ A software based 'Pump start sequence failed to complete' alarm shall be provided. If a start sequence fails to complete within a set time (not operator adjustable) an alarm shall be raised.
- ☐ In case of tripping of any working pump the standby pump shall start automatically.

► The analog signal of ultrasonic type level measuring system shall be used for pump controls. Independent level switches shall be provided to detect 'high high' level within the wet well to provide indication of pumping system or control system failure and to detect 'low low' level (dry run protection).

► The pumps shall be started / stopped automatically at various levels in the wet well.

► Stop Sequence

The pump automatic mode stop routine shall be as follows:

- Pump drive shall be stopped and discharge valve shall be closed.
- When the pump stops and the discharge valve closes, the stop sequence is complete.
- In case power supply is not available the valve shall close on resumption of power.
- There shall be time delay of 180 seconds between stopping of any 2 pumps.
- A software based 'Pump stop sequence failed to complete' alarm shall be provided. If stop sequence fails to complete within a set time an alarm shall be raised.
- The pump shall stop immediately in case of power failure and hardwired trip condition.
- The low level switch provided in the wet well shall be hardwired to all pump feeders tripping for dry run protection.

► Black start condition

During the running of the pumps if mains power fails, then on resumption of power supply following sequence shall be followed:

- The discharge valves shall be closed.
- The pump automatic start routine shall be followed.

In any condition, no two pumps shall be started simultaneously. The starting of the pumps shall be staggered with an adjustable timer.

► Duty Selection

The working pumps shall be manually selected at the ICP through selector switch. In the event of a working pump failure, the standby drive shall start in its place, automatically. The pump shall now run in all respects as a duty pump until reselected manually as a standby. If a duty pump is selected as standby when it is running it shall stop.

► Typical I/O Schedule for Sewage Pumping Station

The typical input/ output (I/O) requirements of PLC is to be given by Bidder:

Notes:

1. Available status is derived at the starter and shall be logical AND of the following signals :
 - Starter mounted 'LV switchboard/ICP/Off' selector switch set to 'ICP'.
 - No power failure at the starter.
 - Emergency stop device not operated.
 - No drive fault.

Bidder shall provide the necessary hardware in the LV switchboard to make available the 'Pump-Motor available' status as described above.

When drive is available for use in automatic mode and when start signal is applied, the drive shall start.

2. Available status is derived at the actuator and shall be logical AND of the following signals :
 - Actuator mounted LOCAL/REMOTE/OFF selector switches set to 'REMOTE'.
 - No power failure at the starter.
 - Emergency stop device not operated.
 - No drive fault

All the necessary hardware required for deriving the 'Valve available' status shall be provided in the actuator.

When drive is available for use in automatic mode and when start signal is applied, the drive shall start.

The I/O schedule detailed is indicative. The Bidder shall provide all the additional I/Os necessary in order to achieve the complete control and monitoring of the plant.

- Changeover from Auto to Manual to Auto

When the pumps are running in auto mode and if the mode of operation is changed from auto to manual, the status of the pumps shall not change. When the pumps are started in manual mode then before switching to auto mode the pump duty selection switch shall be selected by the operator.

- Manual Control Mode
 - Manual mode of operation shall be independent of PLC.
 - When the 'ICP/local/off' selector switch is in 'ICP' position and the auto/ manual selector switch is in the 'manual' mode, the pumps shall be started/ stopped through pushbuttons provided on the ICP panel.
 - When the Local/ Remote/ Off selector switch on the actuator is in the 'remote' mode and the auto/manual selector switch is in the 'manual' mode, the motorised valves shall be operated from the push buttons provided on the ICP.
 - However, the pumps shall stop automatically if the level in the STPs wet well is at 'low low' level in order to prevent dry running of the pumps in all the control modes.

16.0 Power supply

Generally, voltage levels for control schemes and power supply for instruments shall be limited to 24 V DC. The ICP primary power supply shall be 240 V AC. Power for the control system shall then be derived from this source using battery charger and sealed maintenance free batteries. This shall be sized to provide sufficient power to maintain the instrumentation systems functioning for a period of 1 hour. In the meantime the D.G. set shall take over.

Battery Charger

- i. A suitable float cum boost battery charger shall be provided for the 24V DC system capable of supplying the load for 1 hour. The bidder shall furnish the calculation of Ampere Hour capacity required for the 1 hour battery backup for review of Engineer's Representative. The battery charger shall be suitable for incoming AC supply voltage of 240V (10% tolerance) with 50 Hz. The battery charger shall be mounted in a powder coated MS cabinet with 2 mm thick sheets. Incoming voltmeter, ammeter, digital frequency meter shall be flush mounted. Also the DC voltmeter and ammeter shall be flush mounted. Indicating lamps shall be provided for mains On, load on mains, Load on Battery, mains failure, rectifier failure, DC fault, out of synch., etc.
- ii. The Battery Charger shall have standard power transistors / thyristors and shall have standard protection devices such as over current, snubber circuits, heat

sinks etc. Smoothing reactors and filter capacitors shall be provided as per the design. The rectifier regulation shall be less than or equal to 2 percent. The battery charger shall be capable of supplying 150% for 1 second and 110% load for 1 minute. Upon complete discharge of the batteries, and resumption of power supply, the battery charger shall be capable of fully charging the batteries in 4 hours.

- iii. The battery charger shall comprise full wave rectifier with a ripple content of less than 3%. Also the THD (Total Harmonic Distortion) of the battery charger shall not exceed 5%.
- iv. There shall be 2 nos. DC output circuit breakers provided in the built-in distribution board in the battery charger. The entire wiring for the battery charger unit shall be in copper. An ingress protection of IP 42 shall be maintained in the battery charger. A hooter shall be provided on the battery charger and shall be directly mounted on the panel. The hooter shall go off when any fault is detected, including incoming power supply fail / rectifier fail. A 12 window annunciator window shall be provided to display the type of fault. Potential free contact shall be provided for group alarm for wiring to ICP. Potential free contact shall be provided for group alarm 'Battery & Battery Charger Fault' for wiring to ICP.
- v. A cable alley shall be provided to facilitate entry and exit of the incoming / outgoing cables respectively. Suitable double compression glands shall be provided on the gland plates.

17.0 Control system voltages

The following voltages shall be used for the control system:

Item	Voltages
Instrumentation power supplies	24 V DC
PLC input-output modules	24 V DC
PLC input-output circuits/ loops	24 V DC

The status of the power supply shall be monitored in the ICP.

18.0 Tests for instrumentation & control system

General

Tests of the equipment/systems at the manufacturer's premises will be required in accordance with the Conditions of Contract. All inspection, examination and testing shall be carried out in accordance with appropriate standards.

All measuring/test instruments used for such tests shall be calibrated and certified by an approved independent testing authority not more than 28 days prior the test in which they are used. Supporting calibration and traceability certificates shall be provided. The Engineer's Representative reserves the right to impound any instrument immediately after test for independent testing. A certificate shall be produced by the Bidder prior to carrying out every test showing the readings obtained, calculations and full details of the calibration certificates referred to.

If the Engineer's Representative witnesses a test he shall be given a copy of the test results and certificates immediately. Whether he witnesses a test or not, copies of test certificates shall be sent to the Engineer's Representative. No item of the equipments/systems shall be forwarded to the Site until its test certificate has been approved in writing by the Engineer's Representative.

Certificates shall be clearly identified by serial or reference number where possible to the material being certified and shall include information required by the relevant Reference Standard or Specification clause.

Inspection at Manufacturer's Premises

The inspection of all equipments/systems require to be supplied to complete the Works shall be done as detailed in this Specification. Only defect free and sound material meeting the technical requirements of this Specification and in accordance with a high standard of engineering would be acceptable to the Engineer's Representative.

For meeting these requirements of inspection, testing shall be carried out by the Bidder and certificates submitted to the Engineer's representative who will have the right to witness or inspect the above mentioned testing/inspection at any stage desired by him. Valid calibration certificates for test instruments shall be produced for the Engineer's consent in advance of testing and if necessary instruments shall be recalibrated or substituted before the commencement of the test. Items of equipments/ system not covered by standards shall be tested in accordance with the details and programme agreed between the Engineer and Bidder.

If during or after testing any item of the equipments/ systems fails to achieve its intended duty of otherwise prove defective it shall be modified or altered as necessary, retested and reinspected as required by the Engineer.

No equipment/system is to be delivered to Site without the above described inspection having been carried out or officially waived in writing by the Engineer's Representative.

Tests On Instrumentation System

19.0 Type Tests

The Bidder shall submit the test certificates for the 'Type Tests' to the Owners/Engineers Representatives for approval. The type tests for the instruments at manufacturers works (Factory Acceptance Tests) shall be as follows:

- 'Burn In' test for electronic components
- Humidity test for electronic instruments
- Weather protection as per IS-13947
- Hysteresis test
- High voltage test
- Short circuit protection test
- Material test

Routine Tests

All instruments shall be subjected to the following routine tests at the manufacturers works (Factory Acceptance Tests) to ensure correct functioning.

A Factory Acceptance Test, which will be witnessed by Owner Engineers. Factory Acceptance Tests shall be conducted according to test plan with detailed test procedures. The test plan and procedures shall be subject to approval by Owner.

Calibration of the instruments

All the instruments shall be calibrated for accuracies as per applicable standards. The calibration shall be carried out at 0, 20,40,60,80 and 100% of the range of the instrument in both increasing and decreasing directions using test instruments to simulate inputs and read outputs that are rated to an accuracy of at least 5 times greater than the specified accuracy of the instrument being calibrated. The instrument will be acceptable if the accuracy and repeatability are better than those specified. The instrument used for testing shall hold a valid calibration certificate from a recognised laboratory. The test instruments shall have accuracies traceable to the National Bureau of Standards as applicable.

Over range protection test

All transmitters, digital panel meters and flow indicators shall be subjected to the over range protection test.

Performance test

All the instruments shall be tested by connecting to the specified power supply for the performance test.

Dimensional check

The dimensions of all the instruments shall be checked thoroughly and shall be tabulated in a good format.

- Wherever applicable, following dimensions shall be checked/noted for flow, pressure and level sensors
 - Total length
 - Insertion length
 - Diameter
 - Mounting head
 - Process connection size etc.
- For panel mounted instruments, transmitters following dimensions shall be checked
 - Width
 - Height
 - Depth
 - Bezel dimensions and cut-out dimensions for panel mounted instruments etc.
- Control Panels shall be subjected for the following dimensional checks
 - Width
 - Height
 - Depth
 - Cut-out dimension for each panel mounted instrument
 - Spacing between the panel mounted instruments

High voltage test for control panels

The H.V. test of 1 kV AC for one minute duration will be implemented between the panel and the individual power supply feeder which shall be isolated from the respective power supply. Any reduction in voltage level or duration is not acceptable.

Insulation test for control panels

Insulation test will be carried out using a 500 V megger as specified below (all instruments will be disconnected from wiring)

- Between individual terminal of terminal block and ground.
- Between individual wire and ground.
- Between adjacent terminals of terminal blocks.

Test on control system in control panels.

- The functioning of the complete control system shall be tested to demonstrate its correct operation in accordance with the Specification.

- For control system testing, the Bidder may provide temporary means to simulate operating conditions, but the system will not be finally accepted until correct operation has been demonstrated to the satisfaction of the Engineer.
- The system shall be shown to operate correctly whatever the selection of duty and standby equipments may be.
- Conditions to be tested shall include:
 - Normal automatic operation.
 - Normal manual operation.
 - Emergency manual operation.

Power supply variation test

All the instruments shall work satisfactorily for the +10 % variations in the supply voltage and +5 % variations in frequency simultaneously. Accuracy and linearity shall not change.

Hydrostatic test

All flow sensors and pressure sensors shall be tested to withstand 150 % of the rated pressure. The sensitivity, accuracy and calibration of the sensors shall not be deteriorated at this over range. There shall not be physical damage.

Repeatability test

All instruments shall be subjected to repeatability test over the full range at 0 %, 20 %, 40 %, 60 %, 80 % and 100 % of the full range. Five readings for each measurement mentioned above shall be taken for calculating and establishing the repeatability.

Tests on cables

- Check details are in accordance with the specification.
- Check for physical damage.
- Megger test between each core and armour/sheath.
- Continuity check.

Battery & Battery Charger Panel

Battery & battery charger panel shall be subjected to all functional, routine and type tests.

Section VI A: General Conditions of Contract

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1. General Provisions

Sub-Title	Sub-Clause	Provision
Definitions	1.1	In the Conditions of Contract (these General Conditions) which include Special Conditions, the following works and expressions shall have the meaning stated as under. Words indicating persons or parties include firms, companies, and other legal entities except where context requires otherwise.
The Contract	1.1.1	
	1.1.1.1	Bill of Quantities (BOQ) means the priced and completed Bill of Quantities forming part of the Bid. Activity Schedule means the various stages of execution of the Works in case of Lump Sum Contract which are linked to payment Schedule.
	1.1.1.2	Contract means the document forming the Bid and acceptance thereof and the formal agreement executed between the competent authority on behalf of the Governor of Rajasthan and the Contractor, together with the documents referred to therein including these conditions, the Specifications, designs, Drawings and instructions issued from time to time on Contract and shall be complementary to one another.
	1.1.1.3	Contract Agreement means the Contract Agreement referred to in Sub-Clause 1.81 [Signing of the Contract].
	1.1.1.4	Contract Data means the pages completed by the Procuring Entity entitled Contract Data which constitute the Special Conditions of the Contract.
	1.1.1.5	Drawings means the Drawings of the Works, as included in the Contract and any additional and modified drawings issued by (or on behalf of) the Procuring Entity in accordance with the Contract.
	1.1.1.6	Letter of Acceptance means the letter of formal acceptance, signed by the Procuring Entity, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such Letter of Acceptance, the expression “Letter of Acceptance” means the Contract Agreement and the date of issuing the Letter of Acceptance means the date of signing the Contract Agreement.
	1.1.1.7	Letter of Technical/ Financial Bid means the document entitled Letter Technical or Letter of Financial bid, which was completed by the Bidder and includes the signed offer to the Procuring Entity for the Works.
	1.1.1.8	Risk and Cost means when the Contractor fails to complete the

		Contract despite due notices, the procuring entity may terminate the Contract with full 10% compensation and/ or measure the acceptable work done and get the balance work of the BOQ/ Activity Schedule carried out at the risk and cost of the Contractor and the difference of cost at which the balance work is carried out through the Department/ Organisation or another agency is debited to the Contractor.
	1.1.1.9	Schedules means the document(s) entitled Schedules, completed by the Contractor and submitted with the letter of Bid, as included in the Contract. Such documents may include the Bill of Quantities, data, lists and Schedules of rates and /or prices.
	1.1.1.10	Specifications means the BIS, IRC, and other Code Specification of the Works followed by relevant Department of the Government of India/ State Government and /or included in the Contract and any modification or addition made or approved by the Engineer-in-Charge.
	1.1.1.11	Technical/ Financial Bid means the Letter of Technical or Financial Bid and all other documents which the Bidder submitted with the Letter of Technical or Financial Bid, as included in the Contract.
Parties and Persons	1.1.2	
	1.1.2.1	Party: means the Procuring Entity or the Contractor, or both as the context requires.
	1.1.2.2	Contractor shall mean the individual, firm or company, whether incorporate or not undertaking the Works and shall include the legal or authorised representative of such individual or the persons composing such firm or company or the successors of such firm or company and the permitted assignees of such individual, firm or company.
	1.1.2.3	Contractor's Personnel means the Contractor and Contractor's Representative and all personnel whom the Contractor utilizes on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works. All communications addressed to the Contractor can be handed over at site to the Contractor's personnel.
	1.1.2.4	Contractor's Representative means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.5 [Contractor's Representative], who acts on behalf of the Contractor.
	1.1.2.5	Engineer-in-Charge or Engineer means the Divisional officer / Executive Engineer who shall be in-charge of the Works and who shall sign the Contract on behalf of the Governor of Rajasthan and who shall be responsible for supervising the Contract, administering the Contract, certifying payments due

		to the Contractor, issuing and valuing Variations to the Contract, awarding extension of time, valuing the Compensation events, etc.
	1.1.2.6	The Procuring Entity or PE means the Party who employs the Contractor to carry out the Works.
	1.1.2.7	Procuring Entity's Personnel means the Engineer-in-Charge, the assistants referred to in Sub-Clause 3.2 [Delegation by the Engineer-in-Charge] and all other staff, labour and other employees of the Engineer-in-Charge and of the Procuring Entity; and any other personnel notified to the Contractor, by the Procuring Entity or the Engineer-in-Charge, as Procuring Entity's Personnel.
	1.1.2.8	Subcontractor means any person / firm named in the Bid /Contract and approved by the Engineer-in-Charge as a Subcontractor, or any person appointed and approved as a Subcontractor subsequently, for a part of the Works; and the legal successors in title to each of these persons/ firms.
Dates, tests and periods of completion	1.1.3	
	1.1.3.1	Base Date means the date 28 Days prior to the last date specified for submission of the Bid.
	1.1.3.2	Commencement/start Date means the date specified under Sub-Clause 8.3.1 [Commencement of Works].
	1.1.3.3	A Defect is any part of the Works not completed in accordance with the approved specifications, designs and/ or drawings of the Contract.
	1.1.3.4	The Defect Liability Certificate is the certificate issued by Engineer-in-Charge after Defect Liability Period has ended and upon correction of Defects pointed out by the Engineer-in-Charge.
	1.1.3.5	The Defect Liability Period will be decided by the Department/ Organisation depending on nature of the Works, from the date of completion of the Works and shall be mentioned in the Contract Data.
	1.1.3.6	Defects Notification Period means the period for notifying Defects in the Works or a Section (as the case may be) under Sub-Clause 13.2 [Completion of Outstanding Work and Remedying Defects], which extends over twelve Months except if otherwise stated in the Contract Data (with any extension under Sub-Clause 13.4 [Extension of Defects Notification Period], calculated from the date on which the Works or Section is completed as certified under Sub-Clause 12.1 [Taking Over of the Works and Sections].

	1.1.3.7	Performance Certificate means a certificate issued under Sub-Clause 13.10 [Performance Certificate].
	1.1.3.8	Taking-Over Certificate means a certificate issued under Sub-Clause 12.1 [Taking Over of the Works and Sections].
	1.1.3.9	Tests on Completion means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 11 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Procuring Entity.
	1.1.3.10	Tests after Completion means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification after the Works or a Section (as the case may be) is taken over by the Procuring Entity.
	1.1.3.11	The Intended Completion Date is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Engineer-in Charge by issuing an extension of time.
	1.1.3.12	Time for Completion means the time for completing the Works or a section (as the case may be) under Sub-Clause 8.4 [Time for Completion], as stated in the Contract Data (with any extension under Sub-Clause 8.6 [Extension of Time for Completion], calculated from Commencement Date.
	1.1.3.13	Day means calendar Day; Year means a period of 365 Days.
Money and Payments	1.1.4	
	1.1.4.1	Accepted Contract Amount means the amount accepted in the Letter of Acceptance for execution and completion of the Works and remedying of any defects and maintaining the Works, if stated in the Contract.
	1.1.4.2	Cost means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.
	1.1.4.3	Final Payment Certificate means the Payment Certificate issued under Sub-Clause 15.9 [Issue of Final Completion Certificate].
	1.1.4.4	Final Statement means the statement defined in Sub-Clause 15.10 [Final Statement of Payments].
	1.1.4.5	Interim Payment Certificate means a Payment Certificate issued under Sub-Clause 15.5 [Issue of Interim Payment Certificate], other than the Final Payment Certificate.
	1.1.4.6	Market Rate of an item shall be the current rate as decided by

		the Engineer-in Charge on the basis of the Cost of Materials and Labour at the Site where the work is to be executed for a variation item.
	1.1.4.7	Payment Certificate means a Payment Certificate issued under Clause 15 [Contract Price, Payment and Lien].
	1.1.4.8	Provisional sums/ Lump sums means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for supply of Plant, Materials or services under Sub-Clause 9.6 [Provisional Sums]. These are also moneys provided in the estimate of the project to pay for unforeseen / un-quantified items. It may also include lump sum provided in the estimate/ BOQ for unforeseen items to be paid after approval of analysis of rates of such items and charges payable to Government agencies or the contractor for approvals, service connections, extensions of services from the supply lines etc., as the case may be.
	1.1.4.9	Performance Security means an amount as percentage of the Accepted Contract Price deposited in the form of Bank Guaranteed or any other prescribed form deposited by the Contractor as a security for due performance of the Contract.
Works and Materials	1.1.5	
	1.1.5.1	Materials are all supplies, including consumables, used by the Contractor for consumption in the Works.
	1.1.5.2	Permanent Works means the Permanent Works to be executed by the Contractor under the Contract. These works shall have a defined designed life and durability.
	1.1.5.3	Plant means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works,
	1.1.5.4	Scope of work shall cover execution of all aspects of the Works as per the Contract.
	1.1.5.5	Section means a part of the Works specified in the Contract Data as a Section (if any).
	1.1.5.6	Specifications means the Specification (BIS, IRC etc. or specifications approved by the department or others) of the Works included in the Contract and any modification or addition made or approved by the Engineer-in Charge.
	1.1.5.7	Temporary Works are Works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.
	1.1.5.8	Work or Works shall, unless there is something either in the subject or context repugnant to such construction, be construed and taken to mean the Works by virtue of the Contract contracted to be executed whether temporary or permanent and whether original, altered, substituted or additional works.

Others	1.1.6	
	1.1.6.1	Act means the Rajasthan Transparency in Public Procurement Act, 2012.
	1.1.6.2	Contractor's documents are the bids (technical and financial) submitted, softwares, bills, reports, drawings, designs, letters/communications, test results, etc., submitted by the Contractor to the Procurement Entity in connection with the Contract.
	1.1.6.3	Department means any Department of Government of Rajasthan which invite Bids on behalf of Governor of Rajasthan as specified in Contract Data.
	1.1.6.4	Field laboratory means the Contractor's equipped laboratory provided with equipments, experienced personnel, consumables, books of specifications and codes for use on quality testing/inspections on the works.
	1.1.6.5	Force Majeure is defined in Sub-Clause 19.1 [Definition of Force Majeure].
	1.1.6.6	Government/ Governor of Rajasthan means the State Government of Rajasthan/ Governor of Rajasthan
	1.1.6.7	Laws means all the national or the state legislations, statutes, ordinances and other laws, and regulations and by-laws of India and Rajasthan and any legally constituted public authority.
	1.1.6.8	Procuring Entity's Equipments means the apparatus, machinery and vehicles (if any) made available by the Procuring Entity on hire for the use of the Contractor in the execution of the Works, as stated in the Specifications; but does not include Plant which has not been taken over by the Procuring Entity.
	1.1.6.9	Rules means the Rajasthan Transparency in Public Procurement Rules, 2013
	1.1.6.10	Site shall mean land and/or other places on, into or through which work is to be executed under the Contract or any adjacent land, path or street through which work is to be executed under the Contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the Contract.
	1.1.6.11	Site office means a suitable covered all weather usable space built by the Contractor at Site of Works at his cost for use by him and the Procuring Entity.
	1.1.6.12	Unforeseeable means not reasonably foreseeable by an experienced Contractor by the Base Date.
	1.1.6.13	Variations mean any change to the Works, which is instructed or approved as a variation under Clause 9 [Deviations, Variations and Adjustments].

Interpretation	1.2	<p>In the Contract, except where the context requires otherwise</p> <ol style="list-style-type: none"> words indicating one gender include all genders; words indicating the singular also include the plural and words indicating the plural also include the singular; provisions including the word “agree”, “agreed” or “agreement” require the agreement to be recorded in writing; “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record; the word “tender” is synonymous with “bid” and “tenderer” with “bidder” and the words “tender document” with “bidding document”. <p>The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.</p>
Communications	1.3	<p>Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, by one party to the other, these communications shall be:</p> <ol style="list-style-type: none"> in writing and delivered by hand against receipt, sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Contract Data; and delivered, sent or transmitted to the address for the recipient’s Communications as stated in the Contract Data. However: <ol style="list-style-type: none"> if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued. <p>Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer-in-Charge, a copy shall be sent to the Engineer-in-Charge or the other Party, as the case may be.</p>
Law and language	1.4	<p>The Contract shall be governed by the laws of India and the State of Rajasthan.</p> <p>The ruling language of the Contract shall be English or that stated in the Special Conditions of Contract.</p>
Works to be carried out	1.5	<p>The Works to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, equipment, tools, plants, testing and quality assurance, and transport which may be required in preparation of and doing in the full and entire execution and completion of the Works. The descriptions given in the Schedule of Quantities (Activity Schedule in case of Lump Sum Contract) shall unless otherwise stated, be held to include wastage on Materials,</p>

		<p>carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other Labour necessary in and for the full and entire execution and completion of the Works as aforesaid in accordance with good practice and recognized principles to deliver a work of specified quality and durability conforming to designs, drawings etc.</p> <p>The Works include clearance, leveling and dressing of Site within a distance of 15 meters of the work site on all sides except where the building adjoins another building.</p>
Sufficiency of Tender/ Bid	1.6	<p>The Contractor shall be deemed to have satisfied himself before bidding as to the correctness and sufficiency of his Bid for the Works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the Works. He shall also be responsible for satisfying himself on the completeness of the documents /data provided by the Procuring Entity. He shall not raise any objections or deficiencies or inaccuracies in such documents.</p>
Discrepancies and adjustment of errors	1.7.1	<p>The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed Drawings being followed in preference to small scale Drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.</p>
	1.7.2	<p>In the case of discrepancy between the Bill of Quantities, the Specifications and/or the Drawings, the following order of preference shall be observed:</p> <ul style="list-style-type: none"> • Description of Bill of Quantities • Particular detailed Specification and Special Condition, if any • Drawings / Designs • IRC / MORT & H , ASTHO Specification, if required • Indian Standard Specifications or B.I.S.
	1.7.3	<p>If there are varying or conflicting provisions made in any one document forming part of the Contract, the Procuring Entity shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the Contractor.</p>
	1.7.4	<p>Any error in description, quantity or rate in Bill of Quantities or any omission therefore shall not vitiate the Contract or release the Contractor from the execution of the whole or part of the Works comprised therein according to Drawings and Specifications or from any of his obligations under the Contract.</p>
Signing of the Contract	1.8.1	<p>The successful Bidder, after submitting the performance guarantee i.e. within 15 Days of receipt of Notification of Award or as specified in the Contract Data, shall attend the office</p>

		<p>of the Procurement Entity / Engineer- in-charge for authentication, signing and completion of the Contract document and execute the agreement consisting of: The notice inviting Bid, all the documents including Drawings, if any, forming the Bidding Document as issued at the time of invitation of bids and acceptance thereof together with any correspondence leading thereto, Standard Forms consisting of various standard Sub-Clauses with corrections up to the date stipulated in Contract Data along with annexure thereto and drawings etc.</p> <p>The Costs of stamp duties and similar charges (if any) imposed by Law in connection with entry into the Contract Agreement shall be borne by the Contractor.</p>
Signed copy of Contract Document to be given to Contractor	1.8.2	The Contractor shall be furnished, free of Cost one signed copy of the Contract Documents together with all Drawings except standard Specifications (BIS or IRC or others), Schedule of Rates and such other printed and published documents, which shall be procured by the Contractor at his cost. These documents shall be deemed to be part of the Contract. These shall be kept in the Site office. None of these documents shall be used for any purpose other than that of this Contract.
Conditions of the Contract	1.8.3	The Contract shall be governed by the General Conditions of Contract (GCC). The Special Conditions of Contract (SCC)/ Contract Data, wherever applicable, shall supersede/ clarify the GCC to the extent specified.
Priority of Documents	1.8.4	<p>The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:</p> <ul style="list-style-type: none"> (a) the Contract Agreement, (b) the Letter of Acceptance, (c) the Technical Bid and Financial Bid along with the letters of the Technical Bid and Financial Bid (d) the Contract Data/ Special Conditions of Contract, (e) the General Conditions of Contract, (f) the Scope of Work & Specifications, (g) the Drawings, (h) the Instructions to Bidders, (i) the Notice Inviting Bids, and (j) the Schedules and any other documents forming part of the Contract. <p>If an ambiguity or discrepancy is found in the documents, the Engineer-in-Charge shall issue any necessary clarification or instruction.</p>
Personnel	1.9.1	The Contractor shall employ the key personnel named in the Schedule of Key Personnel as referred to in the qualification criteria to carry out the functions stated in the Schedule or other personnel approved by the Engineer-in-Charge. The Engineer-

		in-Charge will approve any proposed replacement of key personnel only if their qualifications, abilities, and relevant experiences are substantially equal to or better than those of the personnel listed in the Schedule.
	1.9.2	If the Engineer-in-Charge asks the Contractor to remove a person who is a member of the Contractor's staff or his work force stating reasons, the Contractor shall ensure that the person leaves the Site within seven Days and has no further connection with the work in the Contract.
Procuring Entity's Risks	1.10	The Procuring Entity is responsible for the excepted risks which are : (a) in so far as they directly affect the execution of the Works in India, the risks of war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot commotion or disorder (unless restricted to the Contractor's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive, or (b) a cause due solely to the design of the Works, other than the Contractor's design.
Contractor's Risks	1.11	All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the Procuring Entity's risks are the responsibility of the Contractor.
Procuring Entity's use of Contractor's documents	1.12	As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor. The Contractor shall be deemed (by signing the Contract) to give to the Procuring Entity a non-terminable transferable non-exclusive royalty-free license to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This license shall: i. apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works, ii. entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor. iii. The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third Party by (or on behalf of) the Procuring Entity for purposes other than those permitted under this Sub-Clause.
Contractor's use of Procuring Entity's Documents	1.13	As between the Parties, the Procuring Entity shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Procuring Entity. The Contractor may, at his

		Cost, copy, use, and obtain communication of these documents for the purposes of the Contract. They shall not, without the Procuring Entity's consent, be copied, used or communicated to a third Party by the Contractor, except as necessary for the purposes of the Contract.
Care and Supply of documents	1.14	<p>The approved Specification, Designs and Drawings shall be in the custody and care of the Procuring Entity. Unless otherwise stated in the Contract, one copy of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make further copies at his Cost.</p> <p>Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Procuring Entity. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer-in-Charge four copies of each of the Contractor's Documents.</p> <p>The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Procuring Entity's Personnel shall have the right of access to all these documents at all reasonable times.</p> <p>If a Party becomes aware of an error or Defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or Defect.</p>
Delays in issuing drawings or instructions.	1.15	<p>The Contractor shall give notice to the Engineer-in-Charge whenever the Works are likely to be delayed or disrupted if any necessary Drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary Drawing or instruction, details of why and by when it should have been issued, and the nature and amount of the delay or disruption likely to be suffered if it is late.</p> <p>If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Engineer-in-Charge to issue the notified Drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Engineer-in-Charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time for Completion],</p> <p>However, if and to the extent that the Engineer-in-Charge's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time,</p>
Confidential Details	1.16	The Contractor's and the Procuring Entity's Personnel shall not disclose all such confidential and other information as may be reasonably required in order to verify compliance with the Contract and allow its proper implementation.

		Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.
2. The Procuring Entity		
Right of Access to the Site	2.1	<p>The Procuring Entity shall give the Contractor right of access to, and possession of at least 80% of the Site within 30 days of signing of the Contract or within the time specified in the Special Conditions of Contract (SCC). If under the Contract the Procuring Entity is required to give to the Contractor possession of any foundation, structure, plant or means of access, the Procuring Entity shall do so in the time and manner stated in the Specification. However, the Procuring Entity may withhold any such right or possession until the Performance Security has been received.</p> <p>If the Contractor suffers delay as a result of a failure by the Procuring Entity to give any such right or possession within such time, the Contractor shall give notice to the Engineer-in-charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to an extension of time for any such delay, if completion is or will be delayed,</p> <p>After receiving this notice, the Engineer-in-charge shall proceed to agree or determine these matters</p> <p>However, if and to the extent that the Procuring Entity's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time.</p>
	2.2	The right and possession may not be exclusive to the Contractor.
Assistance by Procuring Entity	2.3	<p>The Procuring Entity shall provide, at the request of the Contractor, such reasonable assistance as to allow the Contractor to obtain expeditiously any permits, licenses or approvals which the Contractor is required to obtain :</p> <ol style="list-style-type: none"> for the delivery of Goods, including clearance through customs, and for the export of Contractor's Equipment when it is removed from the Site.
Procuring Entity's Personnel	2.4	The Procuring Entity shall be responsible for ensuring that the Procuring Entity's Personnel and the Procuring Entity's other Contractors on the Site, co-operate with the Contractor's efforts under Sub-Clause 4.7 [Co-operation], and take actions similar to those which the Contractor is required to take under Sub-Clause

		4.8 [Safety Procedures] and under Sub-Clause 4.17 [Protection of the Environment]
Procuring Entity's Claims	2.5	<p>If the Procuring Entity considers himself to be entitled to any payment under any Sub-Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Liability Period, the Procuring Entity or the Engineer-in-charge shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.18 [Electricity, Water and Gas], under Sub-Clause 4.19 [Issue of Procuring Entity's Equipment and Materials], or for other services requested by the Contractor.</p> <p>The notice shall be given as soon as practicable and no longer than 28 Days after the Procuring Entity became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given 28 days before the expiry of such period.</p> <p>The particulars shall specify the Sub-Clause or other basis of the claim, and shall include substantiation of the amount and/or extension Defects Notification Period to which the Procuring Entity considers himself to be entitled in connection with the Contract. The Engineer-in-charge shall then proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the amount (if any) which the Procuring Entity is entitled to be paid by the Contractor, and/or the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 13.4 [Extension of Defects Notification Period].</p> <p>This amount may be included as a deduction in the Contract Price and Payment Certificates. The Procuring Entity shall be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.</p>
Quality Control	2.6	<p>The Procuring Entity shall have the right to exercise proper Quality Control measures. The Contractor shall provide a fully equipped field laboratory, testing personnel, consumables and other assistance at his cost to conduct such tests. The Quality Control shall be in three tiers :</p> <ul style="list-style-type: none"> i) tier one by the Contractor's Engineers to the specified frequency, ii) by the Engineer-in-Charge's personnel to conform the quality and acceptance of the work and iii) by the Technical Examiner's organisation or such other independent bodies of State Government/ the Department/ Organisation or QCI approved Third Party Quality Inspection Agency. The work shall have to be completed to conform to the specifications and shall be acceptable only after rectification of deficient /defective works as per 'Non Conformance Reports', if any, issued by the above mentioned agency or the Engineer-in-Charge.

3. Engineer-in-Charge		
Duties and Responsibilities	3.1.1	<p>The Executive Engineer of the concerned Division will function as the Engineer-in-Charge for the purpose of the Contract or the Procuring Entity shall appoint another engineer as the Engineer-in-charge, as specified in the Contract Data, who shall carry out the duties assigned to him in the Contract and ensure execution of works as per approved drawings, designs, specifications etc.. The Engineer-in-charge's staff shall include suitably qualified Engineers and other professionals who are competent to carry out these duties.</p> <p>The Engineer-in-charge shall have no authority to amend the Contract. The Engineer-in-charge may exercise the authority attributable to the Engineer-in-charge as specified in or necessarily to be implied from the Contract. If the Engineer-in-charge is required to obtain the approval of the Procuring Entity before exercising a specified authority, he shall have to obtain that approval.</p>
	3.1.2	<p>The Procuring Entity shall promptly inform the Contractor of any change to the authority attributed to the Engineer-in-charge.</p> <p>However, whenever the Engineer-in-charge exercises a specified authority for which the Procuring Entity's approval is required, then (for the purposes of the Contract) the Procuring Entity shall be deemed to have given approval.</p> <p>Except as otherwise stated in these Conditions:</p> <ol style="list-style-type: none"> whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Engineer-in-charge shall be deemed to act for the Procuring Entity; the Engineer-in-charge has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract; and any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Engineer-in-charge (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies, quality of works and non-compliances to specifications/ instructions of the Engineer-in-charge /Procuring Entity. Any act by the Engineer-in-charge in response to a Contractor's request except otherwise expressly specified shall be notified in writing to the Contractor within 28 Days of receipt. <p>The Engineer-in-charge shall obtain the specific approval of the competent authority before taking action under the following Sub-Clauses of these Conditions and other Sub-Clauses, if specified in the Contract Data:</p> <ol style="list-style-type: none"> Sub-Clause 4.12 [Unforeseeable Physical Conditions] agreeing or determining an extension of time and/or additional Cost.

		<p>ii. Sub-Clause 9.1 [Right to Vary]: Instructing a Variation, except;</p> <p>(a) in an emergency situation as determined by the Engineer-in-charge, or</p> <p>(b) if such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data.</p> <p>iii. Approving a proposal for Variation submitted by the Contractor in accordance with Sub-Clause 9.1 [Right to Vary] or Sub-Clause 9.3 [Value Engineering].</p> <p>Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer-in-charge, an emergency occurs affecting the safety of life or of the Works / workmen or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer-in-charge, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the competent authority, with any such instruction of the Engineer-in-charge. The Engineer-in-charge shall determine (after due approval from the competent authority) an addition to the Contract Price, in respect of such instruction, in accordance with Clause 9 [Deviations, Variations and Adjustments] and shall notify the Contractor accordingly, with a copy to the Procuring Entity.</p>
Delegation by Engineer- in- Charge	3.2	<p>The Engineer-in-charge may from time to time assign duties and delegate authority to assistants and may also revoke such assignment or delegation. These assistants may include a resident Engineer, and/or independent inspectors appointed to inspect and/or test items of works and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties.</p> <p>However, unless otherwise agreed by both Parties, the Engineer- in-charge shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [Determinations]</p> <p>Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorized to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer-in-charge. However:</p> <p>i. any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Engineer-in-charge to reject the work, Plant or Materials;</p> <p>ii. if the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer-in-charge, who shall promptly confirm, reverse or</p>

		vary the determination or instruction.
Instruction of the Engineer-in-Charge	3.3	<p>The Engineer-in-charge may issue to the Contractor (at any time) instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any Defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer-in-charge, or from an assistant to whom the appropriate authority has been delegated under Sub-Clause 3.2. If an instruction constitutes a Variation, Clause 9 [Deviations, Variations and Adjustments] shall apply.</p> <p>The Contractor shall comply with the instructions given by the Engineer-in-charge or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Engineer-in-charge or a delegated assistant:</p> <ol style="list-style-type: none"> gives an oral instruction, receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working Days after giving the instruction, and does not reply by issuing a written rejection and/or instruction within two working Days after receiving the confirmation, then the confirmation shall constitute the written instruction of the Engineer-in-charge or delegated assistant (as the case may be).
Replacement of Engineer-in-Charge	3.4	If the Procuring Entity intends to replace the Engineer-in-charge, the Procuring Entity shall inform the contractor by a notice before the intended date of replacement, the name and contact details of the intended replacement of the Engineer-in-charge.
Determinations	3.5	<p>Whenever these Conditions provide that the Engineer-in-charge shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter like variations, extensions of time, responsibilities / valuation for loss and or damage to works etc., the Engineer-in-charge shall peruse the Contract, Specifications, Codes and consult the Contractor in an endeavor to reach an agreement. If an agreement is not reached, the Engineer-in-charge shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.</p> <p>The Engineer-in-charge shall give notice to the Contractor of each agreement or determination, with supporting particulars, within 28 Days from the likely date of implementation of such agreement or determination and obtain receipt of the corresponding claim or request except when otherwise specified. The Contractor shall give effect to each determination unless and until revised under Clause 21 [Claims, Disputes and Arbitration].</p>
Minutes of	3.6	The Engineer-in-charge may require the Contractor to attend a

Meeting		<p>progress review / or quality assurance/ design review meeting during execution of the Works. The Engineer- in-charge shall record the minutes of the meeting and provide a copy within 7 days to the Contractor for compliance. These minutes will be a part of evidence in case of request for extension of time or variation or punitive action against the Contractor as per terms of the Contract.</p> <p>In case the issue of minutes is delayed, the Contractor may issue the record note of discussions and decisions taken in the meeting for record and confirmation by the Engineer-in Charge. These shall be treated as confirmed if not denied within 15 days by the Engineer-in-Charge.</p>
4. The Contractor		
General Obligations and Contractor's personnel.	4.1.1	<p>The Contractor shall design, prepare drawings (to the extent specified in the Contract), execute as per specifications and complete the Works in accordance with the Contract and with the Engineer-in-Charge's instructions, and shall remedy any Defects in the Works.</p> <p>The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of Defects.</p>
	4.1.2	<p>The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the Contract, the Contractor shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of works, Plant and Materials as is required for the item to be in accordance with the specifications for items of Contract, and shall not otherwise be responsible for the design or Specification of the Permanent Works.</p>
	4.1.3	<p>The Contractor shall deploy experienced and competent personnel to execute the works. The quality of workmanship has to be as specified. Personnel not found capable of good workmanship shall be removed and replaced with better workman.</p>
	4.1.4	<p>The Contractor shall, whenever required by the Engineer-in-charge, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. He shall also be responsible for the safety of works and personnel at the site and shall submit a safety execution plan (as per relevant code for safety at construction site) for the approval by the Engineer-in-charge. No significant alteration to these arrangements and methods shall be made without this having previously been approved by the Engineer-in-charge. He shall also comply to the requirements of the mitigations of the Environmental impacts of the execution of works.</p>

	4.1.5	<p>If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Special Conditions of Contract:</p> <ul style="list-style-type: none"> i. the Contractor shall submit to the Engineer-in-charge the Contractor's Documents for this part in accordance with the procedures specified in the Contract. ii. these Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in the Sub-Clause 1.4 [Law and Language] and shall include additional information required by the Engineer-in-charge to add to the Drawings for co-ordination of each Party's designs; iii. the Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and iv. prior to the commencement of the Tests on Completion, the Contractor shall submit to the Engineer-in-charge the "as-built" drawings, designs and documents and, if applicable, operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Procuring Entity to operate, maintain, dismantle, reassemble, adjust and repair all parts of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Clause 12 [Taking Over of the Works and Sections] until these documents and manuals have been submitted to the Engineer-in-charge.
	4.1.6	<p>The Contractor shall allow the Engineer-in-charge and any person authorized by the Engineer-in-charge access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where Materials or plant are being installed / assembled for the Works. The contractor may satisfy himself regarding site, acquisition of land, approach roads etc.</p>
	4.1.7	<p>The liability, if any, on account of quarry fees, royalties, octroi, service tax, and any other taxes and duties in respect of materials actually consumed on public work shall be borne by the Contractor.</p>
	4.1.8	<p>The cost of all water / power connections necessary for the execution of the Works and the cost of water consumed and hire charges of meters and the cost of electricity consumed in connection with the execution of the Works shall be paid by the Contractor except where otherwise specifically indicated. He shall also be responsible for environment mitigated disposal of waste water released during execution.</p>
Compliance with the Code of	4.2.1	<p>The Contractor is bound by the provisions of the Code of Integrity stipulated in the Act , the Rules and specified in ITB Sub-Clause</p>

Integrity		<p>1.3 [Code of Integrity] and refrain himself from corrupt, fraudulent, coercive and collusive practices which are defined as below:</p> <ul style="list-style-type: none"> a) “corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party; b) “fraudulent practice” means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; c) “coercive practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party; d) “collusive practice” means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.
	4.2.2	The Procuring Entity shall take legal action against the Contractor, if it breaches any provisions of the Code of Integrity, under Section 11(3), 46 and chapter IV of the Act.
	4.2.3	The Contractor shall permit the Procuring Entity to inspect the Contractor’s accounts and records relating to the performance of the Contract and to have them audited by auditors appointed by the Procuring Entity, if so required by the Procuring Entity.
Performance Security	4.3.1	<p>The Contractor shall have the option to furnish a Performance Security @ 10% of the Contract value, in Indian Rupees, in one of the following forms <i>[strike out which is not applicable]</i>:</p> <ul style="list-style-type: none"> i. Deposit through eGRAS; or ii. Bank Draft or Banker's Cheque of a Scheduled Bank in India; or iii. National Savings Certificates and any other script/ instrument under National Savings Schemes for promotion of small savings issued by a Post Office in Rajasthan, if the same can be pledged under the relevant rules. They shall be accepted at their surrender value at the time of Bid and formally transferred in the name of the Procuring Entity with the approval of Head Post Master; or iv. Bank guarantee. It shall be of a scheduled Bank in India in prescribed or other acceptable format or from other Issuer acceptable to the Procuring Entity. The bank guarantee shall be got verified from the issuing bank and confirmer, if any; or v. Fixed Deposit Receipt (FDR) of a Scheduled Bank in India. It shall be in the name of the Procuring Entity on account of Bidder and discharged by the Bidder in advance. The Procuring Entity shall ensure before accepting the Fixed Deposit Receipt that the Bidder furnishes an undertaking from the bank to make payment/ premature payment of the Fixed Deposit Receipt on demand to the Procuring Entity without requirement of consent of the Bidder concerned. In the event of forfeiture of the Performance Security, the Fixed Deposit shall be forfeited along with interest earned on such Fixed Deposit.

		vi. The Contractor shall have option to get the Performance Security deposited by deduction from his each running and final bill (Payment Certificate) @ 10% of the amount of the bill.
Additional Performance Security	4.3.2	<p>i. If the Bid, which results in the lowest evaluated bid price, is seriously imbalanced or front loaded in the opinion of the Procuring Entity, the Procuring Entity may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analysis, taking into consideration the schedule of estimated Contract payments, the Procuring Entity may require that the amount of the performance security be increased (to a maximum of 20% of the bid value of such items) at the expense of the Bidder to a level sufficient to protect the Procuring Entity against financial loss in the event of default by the successful Bidder under the Contract.</p> <p>ii. Without limitation to the provisions of the rest of this Sub-Clause, whenever the Engineer-in-charge determines an addition to the Contract Price as a result of a change in Cost, or as a result of a Variation of the Contract Price, the Contractor shall at the Engineer-in-charge's request promptly increase the Performance security to a level of 10 percent of the increased Contract Price.</p>
	4.3.3	<p>The proceeds of the Performance Security shall be forfeited and shall be payable as compensation to the Procuring Entity on happening of any of the events mentioned below:</p> <ol style="list-style-type: none"> when the Contractor does not execute the agreement within the specified time; after issue of letter of acceptance/ placement of work order; or when the Contractor fails to commence the work within the time specified; or when the Contractor fails to complete the work satisfactorily within the time specified; or when any terms and conditions of the contract is breached; or Failure by the Contractor to pay the Procuring Entity any amount due, either as agreed by the Contractor or determined under any of the Sub-Clauses of these Conditions or another agreement, within 30 Days of the service of notice to this effect by Engineer-in-Charge; or if the Contractor breaches any provision of the Code of Integrity prescribed for Bidders specified in the Act, the Rules, ITB Sub-Clause 1.3 and Sub-Clause 4.2.1 of these conditions. <p>Notice of reasonable time will be given in case of forfeiture of Performance Security. The decision of the Procuring Entity in this regard shall be final.</p>

	4.3.4	<p>The Contractor shall ensure that the Performance Security remains valid upto a period 60 days beyond fulfillment of all the obligations of the Contractor under the Contract, including defect liability and maintenance, if any. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 Days prior to the expiry date as provided in the Contract, the Contractor shall get extended the validity of the Performance Security.</p> <p>Failure by the Contractor to extend the validity of the Performance security as described herein above, in which event the Engineer-in-charge may claim the full amount of the performance security.</p>
	4.3.5	<p>The Procuring Entity shall return the Performance Security or release the Performance Security Declaration to the Contractor as below after completion of all obligations under the Contract, more specifically, after the expiry of the period as specified below:</p> <ol style="list-style-type: none"> In case of contracts relating to hiring of trucks and other T&P, transportation including loading, unloading of materials, the amount of Performance Security will be refundable along with the final bill. Ordinary repairs: 3 months after the completion of the Works, provided the final bill has been paid. Original Works / Special Repair Works: Performance Security will be refunded six months after completion, or after expiry of one full rainy season, or after expiry of defect liability period and maintenance period, if any specified in the Contract Data, whichever is later, provided the final bill has been paid. In case of supply of materials: after 3 months of completion of supply, provided the final bill has been paid. In case of PWD original Works/ Special Repair Works costing more than Rupees 100 lakh, partial amount of Performance Security will be refunded during the defect liability @ 10% of the Performance Security amount after the lapse of one year of completion and thereafter 10% of original amount of Performance Security at the end of each subsequent year. The remaining amount of Performance Security will be refunded after the satisfactory expiry of the defect liability period.
	4.3.6	<p>In the event of the Contract being determined or rescinded under any of the provisions of Sub-Clause 16.1, the Performance Security shall stand forfeited in full and shall be absolutely at the disposal of the Procuring Entity.</p>
	4.3.7	<p>For works for which a maintenance period of 3-5 years is also specified in addition to the defect liability period. The regular maintenance shall be a part of the BOQ of the Contract as a lump sum amount per annum to be paid on quarterly basis. Necessary price escalation as per provisions in the Contract shall also be payable for years subsequent to the expiry of the Defect Liability</p>

		Period.
Commencement of Work at the earliest. Record the commencement or start date.	4.4	<p>The Contractor shall commence the Works after signing of the Contract within the period as specified in the Special Conditions of the Contract. In case the Contractor does not commence the works within the above period, the Engineer-in-charge shall issue a notice after the expiry of the said period. The actual date of commencement shall be duly recorded by the Engineer-in-Charge.</p>
Contractor's Representative	4.5	<p>Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract.</p> <p>Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Engineer-in-charge for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked in terms of this Sub-Clause, or if the appointed person fails to act as Contractor's Representative, or conducts improperly at the Site, the Contractor shall submit the name and particulars of another suitable person for such appointment. The former representative shall be removed within 24 hours of such notice by the Engineer-in-charge.</p> <p>The Contractor shall not, except if the representative has lost the confidence of the Contractor or is not complying to the instructions of the Engineer-in-charge or his assistants, remove without the prior consent of the Engineer-in-charge, revoke the appointment of the Contractor's Representative or appoint a replacement.</p> <p>The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Engineer-in-charge's prior consent, and the Engineer-in-charge shall be notified accordingly. The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [Instructions of the Engineer-in-charge] and comply to them.</p> <p>The Contractor's Representative may delegate any powers, functions and authority to any competent person and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Engineer-in-charge has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked. The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause 1.4. If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make competent interpreters available during all working hours in a</p>

		number deemed sufficient by the Engineer-in-charge.
Sub-Contractor, nominated Sub-Contractor.	4.6	<p>The Contractor shall not Sub-let or subcontract the whole/ or even part of the Works without the consent of the Engineer-in-charge. If the Contractor does so, the Contract shall be liable to be terminated under Sub-Clause 16.1[Termination by Procuring Entity]. Details of the capability of such proposed Sub-Contractors (except the nominated Sub-Contractor named by the Engineer-in-charge) shall be approved by the Engineer-in-charge. The Contractor shall be responsible for the misconduct, acts or defaults of any Subcontractor, his agents or employees, as if they were the acts or defaults of the Contractor.</p> <p>Unless otherwise stated:</p> <ul style="list-style-type: none"> i. the Contractor shall not be required to obtain consent to suppliers solely of materials, or to a subcontract for which the nominated Subcontractor is named in the Contract. ii. the prior consent/ approval of the Engineer-in-charge on capability documents of the sub-contract shall be obtained for proposed Sub-Contractor; iii. the Contractor shall give the Engineer-in-charge not less than 28 Days' notice of the intended date of the commencement of each Sub-Contractor's work, and of the commencement of such work on the Site. <p>The Contractor shall ensure that the requirements imposed on the Contractor regarding Confidentiality as defined in the GCC Sub-Clause 1.16 [Confidential Details] shall apply equally to each nominated Subcontractor / Subcontractor.</p>
Co-Operation	4.7	<p>The Contractor shall, as specified in the Contract or as instructed by the Engineer-in-charge, allow appropriate opportunities for carrying out work to:</p> <ul style="list-style-type: none"> i) the Procuring Entity's Personnel, ii) any other Contractors employed by the Procuring Entity, and iii) the personnel of any legally constituted public authorities, <p>who may be employed in the execution on or near the Site of any work not included in the Contract.</p> <p>Any such instruction shall constitute a Variation if and to the extent that it causes the Contractor to suffer delays and/or to incur Unforeseeable Cost. Services for these personnel and other Contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.</p> <p>If, under the Contract, the Procuring Entity is required to give to the Contractor, possession of any foundation, structure, plant or means of access in accordance with Contractor's</p>

		Documents, the Contractor shall submit such documents to the Engineer-in-charge in the time and manner stated in the Specifications.
Safety Procedures at the site of works	4.8.1	<p>The Contractor shall:</p> <ol style="list-style-type: none"> prepare and submit for approval by the Engineer-in-charge an auditable safety plan at Site in accordance with relevant Code. The Contractor shall comply with all applicable safety regulations; take care for the safety of all persons entitled to be on the Site; use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons; provide fencing, lighting, guarding and watching of the works until completion and taking over under Sub-Clause 12.1 [Taking over of Works]; and provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land. <p>In addition to the provisions of this Contract, the Contractor shall follow the safety code of the Department.</p>
Safety Provisions for labour	4.8.2	In respect of all labour directly or indirectly employed, noncompliance in the work for the performance of the Contractor's part of this Contract, the Contractor shall at his own expense arrange for the safety provisions as per P.W.D. Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the Contractor fails to make arrangement and provide necessary facilities as aforesaid, the Engineer-in-Charge shall be entitled to provide for all such arrangements at the risk and cost of the Contractor plus 15% as agency charges.
Quality Assurance	4.9.1	<p>The Procuring Entity shall have the right to exercise proper Quality Control measures to ensure that the works have been executed as per specifications and have the designed durability. It will be in three tiers:</p> <ol style="list-style-type: none"> The first tier being the Contractor's engineers ensuring full compliance to specifications and conforming the same through testing (as per frequencies specified in the BIS, IRC or other relevant codes) on input materials, processes and the output in the field laboratory established by the Contractor at his cost . The second tier shall be the Engineer-in-charge's team conducting such tests to the extent of the specified code frequency at the Contractor's field laboratory or Department/ Organisation's laboratory and comparing the results with those carried out by the Contractor's Engineers; and The third tier shall be the 'Third Party Quality Inspections' by the QCI approved / accredited Inspection Bodies as per ISO 17020, or by the Technical Examiner of the Department/ Organisation,

		<p>where exists. The QCI approved / accredited Inspection Body may be selected through competitive bidding. The third tier shall conduct such tests to the extent of 10% of the specified frequencies duly witnessed by the Contractor's & Procuring Entity's Engineers and providing a final acceptability on the Works costing above Rs 10 crores for buildings and structures and Rs.20 crores for roads, bridges/ flyovers, canals, dams, etc. as specified in the SCC.</p> <p>The Contractor shall provide all assistance to conduct such tests.</p>
	4.9.2	<p>The Contractor shall institute a approved quality assurance plan stating the methodology / responsibility for sampling, testing/ confirmatory testing, testing frequencies, statistical quality controls, observation / report formats, acceptance criteria, issue and resolution of Non Conformance Reports etc. to demonstrate compliance with the requirements of the specifications. The system shall be in accordance with the details stated in the Contract. The Engineer-in-charge shall be entitled to audit any aspect of the system.</p> <p>Details of all procedures and compliance documents shall be submitted to the Engineer-in-charge for information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer-in-charge, evidence of the prior acceptance by the Contractor himself shall be apparent on the document itself.</p> <p>Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.</p>
Site Data	4.10.1	<p>The Procuring Entity shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Procuring Entity's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Procuring Entity shall similarly make available to the Contractor all such data which come into the Procuring Entity's possession after the Base Date. The Contractor shall be responsible for verifying and interpreting all such data. The Procuring Entity shall not be held responsible about the correctness of all such data and the Contractor shall confirm/ verify all such data at his own cost.</p>
	4.10.2	<p>To the extent which was practicable (taking account of Cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Bid for Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Bid as to all relevant matters, including (without limitation):</p> <ol style="list-style-type: none"> the form and nature of the Site, including sub-

		<p>surface conditions,</p> <p>ii. the hydrological and climatic conditions,</p> <p>iii. the extent and nature of the work and goods necessary for the execution and completion of the Works and the remedying of any Defects,</p> <p>iv. the Laws, procedures and labour practices of India, particularly Rajasthan, and</p> <p>v. the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.</p>
Sufficiency of the Contracted Amount	4.11	<p>The Contractor shall be deemed to:</p> <p>i. have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount, and</p> <p>ii. have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [Site Data].</p> <p>Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any Defects.</p>
Unforeseeable Physical Conditions	4.12	<p>In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.</p> <p>If the Contractor encounters adverse physical conditions which the Procuring Entity considers to have been Unforeseeable, the Contractor shall give notice to the Engineer-in-charge as soon as practicable.</p> <p>This notice shall describe the physical conditions, so that they can be inspected by the Engineer-in-charge, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Engineer-in-charge may give. If an instruction constitutes a Variation, Clause 9 [Deviations, Variations and Adjustments] shall apply.</p> <p>If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/ or incurs Cost due to these conditions, the Contractor shall be entitled subject to notice under Sub-Clause 21.2 [Contractor's Claims] to:</p> <p>i. an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time</p>

		<p>for Completion], and</p> <p>ii. payment of any such Cost, directed to be incurred by the Contractor as approved extra item which shall be included in the Contract Price.</p> <p>Upon receiving such notice and inspecting and/or investigating these physical conditions, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine whether and (if so) to what extent these physical conditions were Unforeseeable, and the matters described in sub-paragraphs (i) and (ii) above related to this extent by the Contractor, but the Engineer-in-charge shall not be bound by the Contractor's interpretation of any such evidence.</p> <p>However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Engineer-in-charge may also review whether other physical conditions in similar parts of the Works (if any) were more favorable than could reasonably have been foreseen when the Contractor submitted the Bid. If and to the extent that these more favorable conditions were encountered, the Engineer-in-charge may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (ii) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.</p>
Right of Way and Facilities	4.13.1	Unless otherwise specified in the Contract the Procuring Entity shall provide access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and Cost, any additional rights of way or facilities outside the Site which he may require for the purposes of the Works.
	4.13.2	The Contractor shall allow the Engineer-in-charge and any person authorized by the Engineer-in-charge access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials are being collected or stored or plant are being installed/ assembled for the Works. The contractor may satisfy himself regarding site, acquisition of land, approach roads etc.
Avoidance of Interference with public conveniences	4.14	<p>The Contractor shall not interfere unnecessarily or improperly with:</p> <p>i. the convenience of the public, or</p> <p>ii. the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Procuring Entity or of others</p> <p>The Contractor shall indemnify and hold the Procuring Entity harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such</p>

		unnecessary or improper interference.
Access Routes to Site	4.15	<p>The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site at Base Date. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.</p> <p>Except as otherwise stated in these Conditions:</p> <ul style="list-style-type: none"> i. the Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes; ii. the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions; iii. the Procuring Entity shall not be responsible for any claims which may arise from the use or otherwise of any access route; iv. the Procuring Entity does not guarantee the suitability or availability of particular access routes; and v. Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne by the Contractor.
Contractor's Equipment	4.16	<p>The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer-in-Charge. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.</p>
Protection of the Environment	4.17	<p>The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.</p> <p>The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values stated in the Specifications or prescribed by applicable Laws.</p> <p>The Contractor shall, throughout the execution and completion of the Works and the remedying of any Defects therein:</p> <ul style="list-style-type: none"> i. have full regard for the safety of all persons entitled to be upon the Site and keep the Site (so far as the same is under his control) and the Works (so far as the same are not completed or occupied by the Procuring Entity) in an orderly state appropriate to the avoidance of danger to such persons; and ii. provide and maintain at his own Cost all lights, guards, fencing, warning signs and watchmen and other things necessary or

		required by the Engineer-in-charge or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others.
Electricity, Water and Gas	4.18	<p>The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require for his construction activities and to the extent defined in the Specifications, for the tests.</p> <p>The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, suitable water, gas and other services as may be available on the Site with due permission of the service provider, on payment of billing value. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring / paying for the quantities consumed.</p>
Issue of Procuring Entity's Equipments and Materials <i>(Not applicable in case of Lump Sum Contract)</i>	4.19	<p>i. The Procuring Entity may on request issue its machinery and equipment on hire to the Contractor, if available, for the use in the execution of the Works. The hire charges shall be as provided in the Contract Data or on the rates declared by the Procuring Entity in general.</p> <p>The Procuring Entity shall hand over the equipment in good working condition duly confirmed by the Contractor at the time of issue, along with departmental operators, helpers. The Contractor shall be responsible for the proper operation and care of the Procuring Entity's Equipment, POL, washout and ordinary repairs Contractor's operators shall not operate the equipment and the rentals / hire and other charges shall be deposited in advance for every 15 days by the Contractor failing which these shall be recovered from the immediately next Interim payment due to the Contractor.</p> <p>ii. The Procuring Entity may issue materials like cement, steel, etc. (if available) to the Contractor for bonafide use in the Works at the rates specified in the Contract Data or at issue rate plus storage charges or free of cost, if it is a labour rate Contract, at the time and place specified in the Contract. Such materials shall be issued at different stages in quantities calculated for each stage by the Engineer-in-Charge.</p>
Progress Reports	4.20	<p>Unless otherwise stated in the Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Engineer-in-charge in specified number of copies along with the interim payment certificates, and the updated construction programme on MS Project or similar software for the next month. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 Days after the last day of the month to which it relates. Reporting shall continue until the Contractor has completed all works which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.</p>

		<p>Each report shall include:</p> <ul style="list-style-type: none"> i. charts, drawings, outputs and detailed descriptions of progress, including each stage of design (if any) on MS project or similar software, Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Sub-Clause 5.2 [Nomination of Sub-Contractors]); ii. photographs (in adequate numbers) showing the status of progress of works on the Site; iii. the details described in Sub-Clause 6.12 [Records of Contractor's Personnel & Equipment]; iv. copies of quality assurance documents, test results, test certificates of manufactured Materials and action taken on Third Party Quality Inspections by the Contractor; v. list of notices given under Sub-Clause 2.5 [Procuring Entity's Claims] and notices given under Sub-Clause 21.2 [Contractor's Claims]; vi. safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and vii. comparisons of actual and planned progress, hindrances, with details of any events or circumstances which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.
Security of the Site and Works	4.21	<p>Unless otherwise stated in the Conditions:</p> <ul style="list-style-type: none"> i. the Contractor shall be responsible for keeping unauthorized persons off the Site, ii. authorized persons shall be limited to the Contractor's Personnel and the Procuring Entity's Personnel; and to any other personnel notified to the Contractor by the Procuring Entity or the Engineer-in-charge, as authorized personnel of the Procuring Entity's other Contractors on the Site. iii. The contractor shall arrange to protect, at his own cost, in an adequate manner, all cut stone work and other work, requiring protection and to maintain such protection as long as work is in progress. He shall remove and replace this protection, as required by the Engineer-in-charge, from time to time. Any damage to the work, so protected, no matter how it may be caused, shall be made good by the Contractor free of cost. All templates, forms. Moulds, centering, false works and models which in the opinion of the Engineer-in-charge are necessary for the proper and workman like execution of the work, shall be provided by the Contractor free of cost. iv. The Contractor shall arrange to keep the site and works secure from manmade disasters, explosions by design or by accident or both at his own cost.
Contractor's Operations on Site	4.22	<p>The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed to by the Engineer-in-charge as additional working areas.</p>

		<p>The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land. During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus Materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.</p> <p>When the annual repairs and maintenance of Works are carried out, the splashes and droppings from white washing, color washing, painting etc. on walls, floor, windows etc. shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done without waiting for the actual completion of all the other items of work in the Contract. In case the Contractor fails to comply with the requirements of this Sub-Clause, the Engineer-in-Charge shall have the right to get this work done at the Cost of the Contractor either Departmentally or through any other agency. Before taking such action, the Engineer-in-Charge shall give ten Day's notice in writing to the Contractor.</p> <p>Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such goods, equipment as are required by the Contractor to fulfill obligations under the Contract.</p>
Fossils/ antiques and articles of value	4.23	<p>All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Engineer-in-charge / Procuring Entity. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.</p> <p>The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer-in-charge, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Engineer-in-charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to:</p> <ul style="list-style-type: none"> i. an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time for Completion]; and ii. Payment of any such Cost, which shall be included in the Contract Price. After receiving this further notice, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

Completion Plans to be Submitted by the Contractor	4.24	<p>The Contractor shall submit completion drawings, designs within thirty Days of the virtual completion of the Works.</p> <p>In case, the Contractor fails to submit the completion drawings, designs as aforesaid, the Engineer-in-charge shall be authorised to get these as built drawings, designs and other data prepared in 6 copies (4 hard and two soft) at the cost of the Contractor.</p>
Contractor to Supply Tools & Plants etc.	4.25	<p>The Contractor shall provide at his own Cost all materials plant, tools, appliances, implements, ladders, cordage, tackle, scaffolding and Temporary Works required for the proper execution of the Works, whether original, altered or substituted and whether included or not in the Specification or other documents forming part of the Contractor referred to in these conditions, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in- Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the Works.</p> <p>The Contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out Works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or Materials. Failing his so doing the same may be provided by the Engineer-in-Charge at the actual Cost +15% as agency charges to the Contractor, under this Contract or otherwise and/ or from his Performance Security or the proceeds of sale thereof, or of a sufficient portion thereof.</p>
Changes in the firm's constitution to be intimated	4.26	<p>Where the Contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the Contractor is an individual or a Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the Contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the Works hereby undertaken by the Contractor. If previous approval as aforesaid is not obtained, the Contract shall be deemed to have been subcontracted in contravention of Sub-Clause 4.6 [Sub-Contractor, nominated Sub-Contractor] and the same action may be taken and the same consequences shall ensue as provided in the Sub-Clause 16.1 [Termination by Procuring Entity]</p>
5. Sub-Contractor and Nomination of Sub-Contractor		
Sub Contractor	5.1	<p>A Sub Contractor, if permitted under the Contract, is a firm or a person specified by the Contractor in his Bid along with details of his capabilities on equipment/ machineries, personnel (technical and others), experience on similar works specific to the project, commitment to Quality assurance etc. He should not have been debarred by the Procuring Entity or the State Government.</p>

Nomination of Sub-Contractor	5.2	In the Contract, “nominated Sub-Contractor” means a Sub-Contractor: (a) who is stated in the Contract as being a nominated Sub-contractor, or (b) whom the Engineer-in-charge, instructs the Contractor to employ as a Subcontractor subject to Sub-Clause 5.3 [Objection to Nomination].
Objections to nominations	5.3	The Contractor shall not be under any obligation to employ a nominated Sub-contractor against whom the Contractor raises reasonable objection by notice to the Engineer-in-charge as soon as practicable, with supporting particulars.
Payment to Nominated Sub-Contractor	5.4	The Contractor shall pay to the Nominated Sub-Contractors the amounts shown on the Nominated Sub-contractor’s invoices approved by the Contractor which the Engineer-in-charge certifies to be due in accordance with the sub-contract. These amounts plus other charges paid to the Nominated Sub-Contractor shall be included in the Contract Price in accordance with Sub-Clause 9.6 [Provisional Sums].
Evidence of payments	5.5	Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer-in-Charge may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor: (a) submits this reasonable evidence to the Engineer-in-Charge, or (b) (i) satisfies the Engineer-in-Charge in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and (ii) submits to the Engineer-in-Charge reasonable evidence that the nominated Subcontractor has been notified of the Contractor’s entitlement, then the Procuring Entity may (at his sole discretion) pay, direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in subparagraphs (a) or (b) above. The Contractor shall then repay, to the Procuring Entity, the amount which the nominated Subcontractor was directly paid by the Procuring Entity.
6. Engagement of Staff and Labour by the Contractor		
Staff and Labour	6.1	i. Except as otherwise stated in the Specifications, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, water, power, healthcare backup, transport and, when appropriate,

		<p>housing.</p> <p>ii. The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications and experience from sources within India.</p> <p>iii. No Engineer of gazetted rank or other gazetted officer employed in Engineering or administrative duties in an Engineering Department of the Government of Rajasthan shall work as a Contractor or employee of a Contractor for a period of two years after his retirement from Government service without the previous permission of State Government in writing. The Contract is liable to be cancelled if either the Contractor or any of his employees is found at any time to be such a person who had not obtained said permission prior to engagement in the Contractor's service, as the case may be.</p>
Bidder barred from bidding if near Relatives working in Procuring Entity's office	6.2	<p>The Contractor shall not be permitted to bid for works of a Procuring Entity in which his near relative is an employee. He shall also not have a person as his employee who is a near relative of an employee of the Procuring Entity. Any breach of this condition by the Contractor shall be considered as breach of Code of Integrity and shall render him liable to action under Section 11(3) of the Act which includes exclusion of his Bid from procurement process, forfeiture of Bid Security, Performance Security or any other security or bond relating to procurement, recovery of payments made, if any, along with interest at bank rate, cancellation of the Contract, if already made, debarment from future bidding for a period upto three years, etc.</p> <p><i>Note: By the term 'near relative' is meant wife, husband, parents and grand- parents, children and grand- children, brothers and sisters, uncles and cousins and their corresponding in- laws.</i></p>
Employment of Technical Staff and other Employees	6.3.1	The Contractor shall Engage technical personnel as per list provided for in the Contract and provide all necessary superintendence during execution of the Works and as long thereafter as may be necessary for proper fulfilling of the obligations under the Contract. The project manager of the Contractor shall be his principal technical representative. Other personnel shall be engaged as specified in the qualification criteria.
	6.3.2	<p>The technical staff should always be available at site whenever required by Engineer- in- charge to take instructions.</p> <p>The Contractor shall comply with the provisions of the Apprenticeship Act, 1961, and the Rules and Orders issued, thereunder, from time to time. If he fails to do so, his failure will be a breach of Contract. The Contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.</p>
Responsibility of the Technical Staff and employees	6.4	Technical officers/ staff deployed by the Contractor at any construction Site will be responsible for proper quality of Works and physical targeted progress of the Works.

Rate of Wages and Conditions of Labour	6.5	<p>The Contractor shall not pay less than fair wages/ minimum wages to labourers engaged by him on the Works as revised from time to time by the State Government, but the Procuring Entity shall not be liable to pay anything extra for it except as stipulated in price escalation Sub-Clause of the agreement.</p> <p>Explanation: “Fair Wage” means minimum wages for time or piece work, fixed or revised, by the State Government under the Minimum Wages Act, 1948.</p> <p>The Contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wages to labourers directly or indirectly engaged on the Works, including any labour engaged by his Sub-Contractors in connection with the said Works as if the labourers have been immediately or directly employed by him.</p> <p>In respect of all labourers, immediately or directly employed on the Works, for the purpose of Contractor’s part of this agreement, the Contractor shall comply with or cause to be complied with the Public Works Department Contractor’s Labour Regulations made, or that maybe made by the State Government from time to time in Regard to payment of wages, wage period, deductions from wages, recovery of wages not paid, and unauthorized deductions, maintenance of wages register, wage card, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and other matters of a like nature.</p> <p>The Engineer-in-charge shall have the right to deduct from the money due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers, by reasons of non-fulfillment of the conditions of the Contract, for the benefit of the worker or the workers, non-payment of wages or of deductions made therefrom, which are not justified by the terms of the Contract, or as a result of non-observance of the aforesaid regulations.</p> <p>Vis-à-vis the State Government of Rajasthan, the Contractor shall be primarily liable for all payments to be made and for the observance of the regulations aforesaid, without prejudice to his right to claim indemnity from his Sub-Contractors.</p> <p>The regulations, aforesaid, shall be deemed to be part of this Contract and any breach, thereof, shall be deemed to be breach of the Contract.</p>
Contractor not to engage staff of Procuring Entity	6.6	<p>The Contractor shall not recruit, or attempt to recruit, full time (on leave) or part time the staff and labour from amongst the Procuring Entity’s Personnel in any capacity.</p>

Working Hours	6.7	<p>No work shall be carried out on the Site on locally recognized Days of rest, or outside the normal working hours stated in the Contract Data, unless:</p> <ul style="list-style-type: none"> i otherwise stated in the Contract, ii. the Engineer-in-charge gives consent, or iii the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer-in-charge.
Facilities for Staff and Labour	6.8	<p>Except as otherwise stated in the Specifications, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide work site facilities for the Procuring Entity's Personnel as stated in the Specifications.</p> <p>The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.</p>
Health & Safety	6.9	<p>The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay, doctor at call and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Procuring Entity's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.</p> <p>The Contractor shall appoint a safety officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified and trained for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.</p> <p>The Contractor shall send, to the Engineer-in-charge, details of any accident occurred at the Site or to or due to the Works, as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer-in-charge may reasonably require.</p>

Contractor's Superintendence	6.10	<p>Throughout the execution of the Works, and as long thereafter as is necessary to fulfill the Contractor's obligations, the Contractor shall provide all necessary superintendence to plan, arrange, direct, manage, inspect and test the Works.</p> <p>Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [Law and Language] and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.</p>
Contractor's Personnel	6.11	<p>Contractor's Personnel shall be appropriately qualified, skilled and experienced in respective trades or occupations. The Engineer-in-charge may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative, if applicable, who:</p> <ul style="list-style-type: none"> i. persists in any misconduct or lack of care, ii. carries out duties incompetently or negligently, iii. fails to conform with any provisions of the Contract, or iv. Persists in any conduct which is prejudicial to safety, health, or the protection of the environment. <p>If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.</p>
Records of Contractor's personnel and Equipment	6.12	<p>The Contractor shall provide all required equipment, machinery at the Site and submit to the Engineer-in-charge, details showing the number of each category of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer-in-charge, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.</p>
Disorderly Conduct	6.13	<p>The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.</p>
Foreign Personnel	6.14	<p>Is permitted, the Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Procuring Entity will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national, or Government permission required for bringing in the Contractor's personnel.</p> <p>The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall</p>

		similarly be responsible for making the appropriate arrangements for their return or burial.
Supply of Food Stuff	6.15	The Contractor shall arrange for the provision of a sufficient supply of suitable food stuff as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.
Supply of Water	6.16	The Contractor shall, having regard to local conditions, provide at his cost on the Site an adequate supply of potable drinking and other water for use in construction and for use of the Contractor's Personnel.
Measures against Insect and Pest Nuisance	6.17	The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce their danger to health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.
Alcoholic Liquor or Drugs	6.18	The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereto by Contractor's Personnel. He shall also not allow the consumption of such Alcoholic Liquor/Drugs at Site during working hours.
Arms and Ammunition	6.19	The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.
No unlicensed storage of Explosives and POL	6.20	The Contractor is not authorised to store explosives and POL or other inflammable materials without a valid license from the competent legal authority.
Prohibition of Forced or Compulsory labour	6.21	The Contractor shall not employ forced or compulsory labour, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.
Prohibition of Child Labour	6.22	The Contractor shall comply with the provisions of Acts and rules pertaining to prohibition of employment of child labour including not employing any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.
Festivals and Religious Customs	6.23	The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.

Employment Records of Workers	6.24	The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer-in-charge, and these records shall be available for inspection by Auditors / labour inspectors and others as per law during normal working hours. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.12 [Records of Contractor's Personnel and Equipment].
Compliance with Labour Laws	6.25	<p>The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights. The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.</p> <p>The Contractor shall obtain a valid license under the State Labour Act, and the Contract Labour (Regulation and Abolition) Central Rules 1961, before the commencement of the Works, and continue to have a valid license until the completion of the Works. The Contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.</p> <p>The Contractor shall also comply with the provisions of the Building and Other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the Building and Other Construction Workers Welfare Cess Act, 1996.</p>
Payment of Wages	6.26	<p>i. The Contractor shall pay to labour employed by him either directly or through Sub-Contractors, wages not less than fair wages as defined in P.W.D. Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act 1970 and the Contract Labour (Regulation and Abolition) Central Rules, 1971, where applicable.</p> <p>ii. The Contractor shall, notwithstanding the provisions of any Contract to the contrary, cause to be paid for wages to labour indirectly engaged on the Works including any labour engaged by his sub-Contractors in connection with the said Works, as if the labour had been immediately employed by him.</p>
Penalty for non-compliance with labour Laws	6.27	i. In respect of all labour directly or indirectly employed in the Works of performance of the Contractor's Part of this Contract, the contractor shall comply with or cause to be complied with the Public Works Department Contractor's Labour Regulations made by the Government from time to time in regard to payment of wages, wage period, deductions from wages, recovery of wages not paid and deductions unauthorisedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns

		<p>and all other matters of the like nature as per the Provisions of Contract Labour (Regulation & Abolition) Act, 1970, and the Contract Labour (Regulation & Abolition) Central Rules, 1971, wherever applicable.</p> <p>ii. The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the Contract for the benefit of the workers, non-payment of wages or of deductions, made from his or their wages which are not justified by their terms of the Contract or non-observance of the Regulations.</p> <p>iii. Under the provision of Minimum Wages (Central) Rules 1950, the Contractor is bound to allow to the labour directly or indirectly employed in the Works one day rest for 6 Days continuous work and pay wages at same rate as for duty. In the event of default the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labour and pay the same to the persons entitled thereto from any money due to the Contractor by the Engineer-in-Charge concerned.</p> <p>iv. The Contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, industrial Disputes Act, 1947, Maternity Act, 1970, or the modifications thereof or any other relevant Labour Laws and the rules made thereunder from time to time.</p> <p>v. The Contractor shall indemnify and keep indemnified the State Government/ Procuring Entity against payments to be made under and for the observance of the Laws aforesaid and the P.W.D. Contractor's Labour Regulations without prejudice to his right to claim indemnity from his Sub-Contractors.</p> <p>vi. The Laws aforesaid shall be deemed to be a part of this Contract and any breach thereof shall be deemed to be a breach of this Contract.</p> <p>vii. Whatever is the minimum wage for the time being, or if the wage payable higher than the minimum wage, such wage shall be paid by the Contractor to the workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise. The Contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.</p>
7. Execution of works and workmanship		

Manner of Execution	7.1	<p>The Contractor shall carry out works, the production of mixes, the procurement of input materials, and all other execution of the Works:</p> <ul style="list-style-type: none"> i. in the manner (if any) specified in the Contract, ii. in a proper workman like and careful manner, in accordance with recognized good practices, and iii. with properly equipped facilities and non-hazardous materials, except as otherwise specified in the Contract.
Samples	7.2	<p>The Contractor shall submit the following samples of Materials, and relevant information, to the Engineer-in-charge for consent prior to using the Materials in or for the Works:</p> <ul style="list-style-type: none"> i. Contractor's standard samples of raw/ produced Materials and samples specified in the Contract, all at the Contractor's Cost, and ii. additional samples instructed by the Engineer-in-Charge as a Variation. <p>Each sample shall be labeled as to origin and intended use in the Works.</p> <p>Samples shall also be collected by the Quality testing/inspection teams from the works in progress and the Contractor shall willingly cooperate with such quality assurance procedures.</p>
Inspection	7.3	<p>The Procuring Entity's Personnel shall at all reasonable times:</p> <ul style="list-style-type: none"> i. have full access to all parts of the Site and to all places from which natural materials are being obtained, and ii. during production, manufacture and construction (at the Site and elsewhere), be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of materials. <p>The Contractor shall give the Procuring Entity's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.</p> <p>The Contractor shall give notice of minimum 07 days to the Engineer-in-charge whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport, beyond measurement, any work in order that the same may be measured and correct dimensions thereof, be taken before the same is covered up. The Engineer-in-charge shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Engineer-in-charge does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer-in-charge, uncover the work and thereafter reinstate and make good, all at the Contractor's Cost.</p>
Stores supplied	7.4	<p>If the specification or estimate of the Works provide for the use</p>

<p>by the Procuring Entity</p> <p><i>(Not applicable in case of Lump Sum Contract)</i></p>		<p>of any special description of materials, to be supplied from the Engineer Incharge's stores, or if, it is required that Contractor shall use certain stores to be provided by the Engineer Incharge specified in the Schedule or Memorandum hereto annexed, the Contractor shall be bound to procure and shall be supplied such materials and stores as are, from time to time, required to be used by him for the purpose of the Contract only, and the value of the full quantity of materials and stores, so supplied, at the rates specified in the said Schedule or Memorandum, may be set off or which may be deducted from any sum, then due or thereafter become due, to the Contractor under the Contract or otherwise or against or from the Performance Security or the proceeds of sale, if the same is held in Government securities, the same or a sufficient portion thereof being in this case, sold for this purpose. All materials supplied to the Contractor, either from departmental stores or with the assistance of the Procuring Entity, shall remain the absolute property of the Procuring Entity. The Contractor shall be the trustee of the stores/ materials, so supplied/ procured and these shall not, on any account, be removed from the Site of the Works and shall be, all times, open to inspection by the Engineer Incharge. Any such materials, unused and in perfectly good condition at the time of completion or determination or rescinding of the Contract, shall be returned to the Engineer Incharge's Stores, if, by a notice in writing under his hand, he shall so require, and if on service of such notice, the Contractor fails to return the materials, so required, he shall be liable to pay the price of such materials. But the Contractor shall not be entitled to return any such materials, unless with such consent, and shall have no claim for compensation on account of any such materials, so supplied to him as aforesaid being unused by him, or for any wastage in or damage to any such materials. For the stores returned by the Contractor, he shall be paid for, at the price originally charged excluding storage charges, in case of materials supplied from departmental stores and actual cost including freight, cartage, taxes etc., paid by the Contractor, in case of supplies received with the assistance of the Procuring Entity, however, should in no case exceed market rate prevailing at the time the materials are taken back. The decision of the Engineer Incharge, as to the price of the stores returned, keeping in view its condition etc., shall be final and conclusive. In the event of breach of the aforesaid condition, the Contractor shall, in addition to throwing himself open to account for contravention of the terms of the license or permit and/or for criminal breach of trust, pay to the Procuring Entity, all advantages or profits resulting or which in the usual course, would result to him by reason of such breach. Provided that the Contractor shall, in no case be entitled to any compensation or damage on account of any delay in supply, or non-supply thereof, all or any such materials and stores.</p>
<p>Penal rate in case of excess consumption</p>	<p>7.5</p>	<p>The Contractor shall return the materials issued free of cost to him and found surplus after its intended consumption in the Works, immediately. The Contractor shall be charged for the materials which were not returned or consumed in excess of the</p>

<i>(Not applicable in case of Lump Sum Contract)</i>		requirements calculated on the basis of standard consumption approved by the Procuring Entity, at double of the issue rate including storage and supervision charges or market rate, whichever is higher. A Materials Supply and Consumption Statement, in prescribed Form RPWA 35A, shall be submitted with every Payment Certificate, distinguishing materials supplied by the Procuring Entity and materials procured by the Contractor himself. The recovery for such materials shall be made from Payment Certificate next after the consumption and shall not be deferred. Certificate of such nature shall be given in each Payment Certificate.
Hire of Plant and Machinery	7.6	Plant and Machinery, required for execution of the Works, may be issued to the Contractor, if available, on the rates of hire charges and other terms and conditions as per the departmental/ Organisation Rules, as per Schedule annexed to these conditions. Rates of such Plant & Machinery shall be got revised periodically so as to bring them at par with market rate.
Imported Store articles to be obtained from the Procuring Entity <i>(Not applicable in case of Lump Sum Contract)</i>	7.7	The Contractor shall obtain from the stores of the Engineer-in-charge, all imported store articles, which may be required for the Works or any part thereof, or in making up articles required thereof, or in connection therewith, unless he has obtained permission, in writing, from the Engineer Incharge. to obtain such stores and articles from elsewhere. The value of such stores and articles, as may be supplied to the Contractor by the Engineer Incharge, will be debited to the Contractor, in his account, at the rates shown in the Schedule attached to the Contract, and if they are not entered in the Schedule, they will be debited at cost price, which for the purposes of this Contract, shall include the cost of carriage and all other expenses, whatsoever, which shall have been incurred in obtaining delivery of the same at the stores aforesaid plus storage charges.
Materials Supplied by the Contractor	7.8	<p>The Contractor shall, at his own expense, provide all materials conforming to the specifications from the sources approved by the Engineer-In-Charge, required for the Works other than those, which are stipulated, to be supplied by the Procuring Entity. Samples for all such materials shall be collected by the Contractor and tested in the presence of representative of the Engineer-in-Charge, at the field laboratory established by the Contractor at the site. Tests which cannot be carried out at the field laboratory, shall be got tested at an NABL accredited laboratory, or any ISI approved laboratory or a Government /Departmental laboratory approved by the Engineer-in-Charge. Only materials so approved shall be used in the works and any change of materials shall be similarly got approved again. Works constructed/executed with unapproved materials shall be summarily rejected without any further investigation or testing.</p> <p>The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.</p>

		<p>The Engineer-in-Charge shall have full powers to require the removal from the premises, of all materials which in his opinion are not in accordance with the Specifications and in case of default the Engineer-in-Charge shall be at liberty to employ at the expense of the Contractor, other persons to remove the same without being answerable or accountable for any loss for damage that may happen or arise to such Materials. The Engineer-in-Charge shall also have full powers to require other proper Materials to be substituted thereof and in case of default the Engineer-in-charge may cause the same to be supplied from other suitable sources and all Costs which may be incurred for such removal and substitution shall be borne by the Contractor.</p>
Testing	7.9.1	<p>This Sub-Clause shall apply to all tests specified in the Contract, other than the Tests after Completion (if any).</p> <p>Except as otherwise specified in the Contract, the Contractor shall provide a field laboratory with all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer-in-charge, the time and place for the specified testing of any Plant, Materials and other parts of the Works.</p> <p>The Engineer-in-charge may, under Sub-Clause 9.2.1 [Deviations/ Variations, Extent and Pricing], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or works or workmanship is not in accordance with the Contract, the Cost of carrying out this variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.</p> <p>The Engineer-in-charge shall give the Contractor not less than 24 hours' notice of the Engineer-in-charge's intention to attend the tests. If the Engineer-in-charge does not attend at the time and place agreed, he may designate a qualified and authorised person to attend the testing, if not, the Contractor may approach the Procuring Entity for deputing an Engineer / any other experienced person to witness the tests. In no case shall the tests be conducted without an Engineer/competent person representing the Procuring Entity.</p>
	7.9.2	<p>If the Contractor suffers delay and/or incurs Cost from complying with these instructions or as a result of a delay for which the Procuring Entity is responsible, the Contractor shall give notice to the Engineer-in-charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to:</p> <ul style="list-style-type: none"> i. an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time for Completion], and ii. payment of any such Cost, which shall be included in the Contract Price.

		<p>After receiving this notice, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters</p> <p>The Contractor shall promptly forward to the Engineer-in-charge, duly certified reports of the tests. When the specified tests have been passed, the Engineer-in-charge shall endorse the Contractor's test certificate.</p>
Cost of Samples	7.10	All samples shall be supplied by the Contractor at his own Cost if the supply thereof is clearly intended by or provided for in the Contract.
Cost of Tests	7.11	<p>The Cost of conducting any test shall be borne by the Contractor if such test is:</p> <ul style="list-style-type: none"> i. clearly intended by or provided for in the Contract, or ii. particularised in the Contract (In case only of a test under load or of a test to ascertain whether the design of any finished or partially finished work is appropriate for the purposes for which it was intended to fulfill) in sufficient detail to enable the Contractor to price or allow for the same in his Bid.
Cost of Tests not provided for	7.12	<p>If any test required by the Engineer-in-charge which is:</p> <ul style="list-style-type: none"> i. not so intended by or provided for in the Contract or codes; ii. (in the cases above mentioned) not so particularized, or iii. (though so intended or provided for), <p>if required by the Engineer-in-charge to be carried out at any place other than the Site or the place of manufacture, fabrication or preparation of the Materials or Plant, on test shows the Materials, Plant or work or workmanship not to be in accordance with the provisions of the Contract/ specifications to the satisfaction of the Engineer-in-charge, then the Cost of such test shall be borne by the Contractor, but in any other case Department/ Organisation will bear the Cost.</p>
Rejection	7.13	<p>If, as a result of an examination, inspection, measurement or testing, any Plant, Materials, works or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer-in-charge may reject the works, Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the reconstructed/ reproduced/ replaced item complies with the Contract.</p> <p>If the Engineer-in-charge requires this Plant, Materials, works, or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause the Procuring Entity to incur additional Costs, the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay these Costs to the Procuring Entity.</p>
Remedial Work	7.14	Notwithstanding any previous test or certification, the Engineer-

		<p>in-charge may instruct the Contractor to:</p> <ol style="list-style-type: none"> remove from the Site and replace any works, Plant or Materials which is not in accordance with the Contract, remove and re-execute any other work which is not in accordance with the Contract, and execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise. <p>The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified under subparagraph iii.</p> <p>If the Contractor fails to comply with the instruction, the Procuring Entity shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay to the Procuring Entity all Costs arising from this failure.</p>
Ownership of Plant and Materials	7.15	<p>Except as otherwise provided in the Contract, each item of Plant and Materials shall, to the extent consistent with the Contract, become the property of the Procuring Entity at whichever is the earlier of the following times, free from liens and other encumbrances:</p> <ol style="list-style-type: none"> when it is incorporated in the Works; when the Contractor is paid the corresponding value of the Plant and Materials under Sub-Clause 8.12 [Payment for Plant and Materials in event of Suspension].
Dismantled Material Government Property	7.16	<p>The Contractor, in course of the Works, should understand that all materials e.g. stone, bricks, steel and other materials obtainable in the Works by dismantling etc. will be considered as the property of the Procuring Entity and will be disposed off to the best advantage of the Procuring Entity, as per directions, of the Engineer-in-charge.</p>
Action where no Specifications are provided.	7.17	<p>In the case of any class of works for which there are no specifications in Bureau of Indian Standards Specifications, Indian Road Congress for road Works and Indian Building Congress for building Works or any Central Government agency, or Departmental Specifications, such works shall be carried out in accordance with the relevant International Standards under the instructions and requirements of the Engineer-in-Charge.</p>
Royalties	7.18	<p>The Contractor shall pay all royalties, rents and other payments for:</p> <ol style="list-style-type: none"> natural Materials obtained from outside the Site, and disposal of materials from demolitions and excavations and of other surplus materials (whether natural or man-made), except to the extent that disposal areas within the Site are specified in

		<p>the Contract.</p> <p>iii. the liability, if any, on account of quarry fees, royalties, octroi and any other taxes and duties in respect of materials actually consumed on public work shall be borne by the Contractor.</p>
8. Commencement, Delays and Suspension		
Fixing centerlines, reference points and bench marks.	8.1	<p>The basic centerlines, reference points and benchmarks will be fixed by the Contractor and checked/confirmed by the Engineer-in-Charge. The Contractor shall establish at his own Cost at suitable points, additional reference lines and benchmarks as may be necessary and instructed by the Engineer-in-Charge. The Contractor shall remain responsible for the sufficiency and accuracy of all the benchmarks and reference lines.</p>
Setting out of works.	8.2	<p>The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract or notified by the Engineer-in-Charge. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.</p> <p>The Procuring Entity shall be responsible for any errors in these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before they are used. If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error in these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided this delay and/ or Cost, the Contractor shall give notice to the Engineer-in-Charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to:</p> <ol style="list-style-type: none"> an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time for Completion], and payment of any such Cost, which shall be included in the Contract Price. <p>After receiving this notice, the Engineer-in-Charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (a) whether and (if so) to what extent the error could not reasonably have been discovered, and (b) the matters described in sub-paragraphs i and ii above related to this extent.</p>
Commencement of Works	8.3.1	<p>Except otherwise specified in the Contract Data/ Special Conditions of Contract, the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Engineer-in-charge's instruction recording the agreement of both Parties on such fulfillment and instructing to commence the Work is received by the Contractor:</p> <ol style="list-style-type: none"> signature of the Contract Agreement (after submission of Performance security and Insurance by the Contractor) by both Parties, and if required, approval of the Contract by

		<p>relevant authorities;</p> <p>ii. delivery to the Contractor of reasonable evidence of the Procuring Entity's Financial arrangements;</p> <p>iii. except if otherwise specified in the Contract Data, possession of the Site given to the Contractor together with such permission(s) under (a) of Clause 2.1 [Right of Access to the Site] as required for the commencement of the Works;</p> <p>The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay. The date of commencement and stipulated completion shall be entered in the Contract Agreement.</p>
	8.3.2	<p>In case, the work cannot be started within one-fourth time of the stipulated period of completion of the Works due to reasons not within the control of the Contractor as decided by the Procuring Entity, either Party may close the Contract. In such eventuality, the Performance Security of the Contractor shall be refunded, but no payment on account of interest, loss of profit or damages etc. shall be payable at all.</p>
Time for Completion	8.4	<p>The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:</p> <p>i. achieving the passing of the Tests on Completion, and</p> <p>ii. Completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Clause 12 [Taking Over of the Works and Sections].</p> <p>iii. Completion of as built drawings and a manual for maintenance and operations, if required.</p> <p>iv. Completion of each mile stone as per the current (original updated every month) construction programme.</p> <p>v. Rectification and or reconstruction of all deficient items of work or works /items of works for which 'Non Conformance Reports' were issued.</p> <p>vi. Restoration of the approach roads, fencing and appurtenant works damaged during execution of the Contracted project and clearance of Site.</p>
Construction Programme <i>(Activity Schedule in case of Lump Sum Contract)</i>	8.5	<p>The Contractor shall submit a detailed execution time programme on MS Project or other similar software to the Engineer-in-charge within 28 Days after receiving the notice under Sub-Clause 8.3 [Commencement of Works]. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall be revised every month and shall include:</p> <p>i. the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), drawings, Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction of works, erection and testing,</p>

		<p>ii. each of these stages for work by each Sub-Contractor/ Nominated Sub-Contractor,</p> <p>iii. the sequence and timing of quality and other inspections and tests specified in the Contract, and</p> <p>iv. a supporting report which includes:</p> <p>(a) a general description of the time, methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and</p> <p>(b) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.</p> <p>Unless the Engineer-in-charge, within 21 Days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Procuring Entity's Personnel shall be entitled to rely upon the programme when planning their activities.</p> <p>The Contractor shall promptly give notice to the Engineer-in-charge of specific probable future events or circumstances which may adversely affect the Works, increase the Contract Price or delay the execution of the Works. The Engineer-in-charge may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances, and/or a proposal under Sub-Clause 9.2 [Deviations/ Variations Extent and Pricing].</p> <p>If, at any time, the Engineer-in-charge gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer-in-charge in accordance with this Sub-Clause.</p>
Extension of Time for Completion	8.6	<p>The Contractor shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to an extension of the Time for Completion if and to the extent that completion for the purposes of Clause 12 [Taking Over of the Works and Sections] is or will be delayed by any of the following causes:</p> <p>i. a Variation (unless an adjustment to the Time for Completion has been agreed under Clause 9 [Deviations, Variations and Adjustments] or other substantial change in the quantity/design of an item of work included in the Contract,</p> <p>ii. a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,</p> <p>iii. exceptionally adverse climatic conditions, excluding the rains, high or low variations in temperatures,</p> <p>iv. Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or Governmental actions, or</p> <p>v. any delay, impediment or prevention caused by or attributable to the Procuring Entity, the Procuring Entity's Personnel, or</p>

		<p>the Procuring Entity's other Contractors</p> <p>If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer-in-charge in accordance with Sub-Clause 21.2 [Contractor's Claims]. When determining each extension of time under Sub-Clause 3.5 [Determinations], the Engineer-in-charge shall review previous determinations and may increase, but shall not decrease, the total extension of time.</p>
Delays Caused by Authorities	8.7	<p>If the following conditions apply, namely:</p> <ul style="list-style-type: none"> i. the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country, ii. these authorities delay or disrupt the Contractor's work, and iii. the delay or disruption was Unforeseeable, <p>Then this delay or disruption will be considered as a cause of delay under Sub-Clause 8.6 [Extension of Time for Completion].</p>
Rate of progress of works.	8.8	<p>As soon as possible after the Contract is concluded the Contractor shall submit a time and progress chart (preferably on MS Project or other similar software) for each milestone and get it approved by the Engineer-in-Charge. The chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the work. It shall indicate the forecast of the dates of commencement and completion of various tasks or sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and Contractor within the limitations of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the Contractor shall in all cases in which the time allowed for any work, exceeds one month complete the work as per milestone.</p> <p>If, at any time:</p> <ul style="list-style-type: none"> i. actual progress is too slow to complete within the Time for Completion, and/or progress has fallen (or will fall) behind the current programme under Sub-Clause 8.5 [Construction Programme], other than as a result of a cause listed in Sub-Clause 8.6 [Extension of Time for Completion], then the Engineer-in-charge may instruct the Contractor to submit, under Sub-Clause 8.5 [Construction Programme], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion. ii Unless the Engineer-in-Charge notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Contractor's Personnel and/or Goods, at the risk and Cost of the Contractor. If these revised methods cause the Procuring Entity to incur additional Costs, the Contractor shall subject to notice under Sub-Clause 2.5 [Procuring Entity's Claims] pay these Costs to the Procuring Entity, in addition to delay damages (if any) under Sub-Clause 8.9

		<p>below.</p> <p>iii. Additional Costs of revised methods including acceleration measures, instructed by the Engineer-in-charge to reduce delays resulting from causes listed under Sub-Clause 8.6 [Extension of Time for Completion] shall be paid by the Procuring Entity, without generating, however, any other additional payment benefit to the Contractor</p> <p>If the progress of the work has fallen so much in arrears as to prevent other contractors on the work from carrying out their part of the work within the stipulated time, he will be liable for the settlement of any claim put in by any of these contractors for the expenses of keeping their labor unemployed to the extent considered reasonable by the Engineer-in-charge.</p>						
<p>Compensation/ Damages for Delay (Liquidated Damage)</p> <p><i>(In case of Lump Sum Contract, the liquidated damages shall be linked to Stage wise completion of Works as stated in Activity Schedule and specified in SCC)</i></p>	<p>8.9</p>	<p>a. If the Contractor fails to maintain the required progress in terms of Sub-Clause 8.4 [Extension of Time for Completion] or to complete the Works and clear the Site on or before the original or extended date of completion, he shall, without prejudice to any other right or remedy available under the Law to the Government/ procuring Entity on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below as the Engineer-in-charge (whose decision in writing shall be final and binding) may decide on the amount of contracted value of the Works for every time span that the progress remains below that specified in Sub-Clause 8.4 [Extension of Time for Completion] or that the Works remains incomplete. This will also apply to items or group of items for which a separate period of completion has been specified.</p> <p>b. To ensure good progress during the execution of Works, the Contractor shall be bound, in all cases in which the time allowed for any Works exceeds one month (save for special jobs or where time spans have been fixed in light of the specific construction programme), to complete 1/8th of the whole of the work before 1/4th of the whole time allowed under the contract has elapsed, 3/8th of the work before 1/2 of such time has elapsed and 3/4th of the work before 3/4 of such time has elapsed. If the Contractor fails to complete the work in accordance with this time schedule in terms of cost in money, and the delay of execution of Works is attributable to the Contractor, the Contractor shall be liable to pay compensation to the Government/ Procuring Entity at every time span as below:-</p> <table><tr><td>A .</td><td>Time Span of full stipulated period</td><td>1/4th</td><td>1/2th</td><td>3/4th</td><td>Full</td></tr></table>	A .	Time Span of full stipulated period	1/4 th	1/2 th	3/4 th	Full
A .	Time Span of full stipulated period	1/4 th	1/2 th	3/4 th	Full			

		B	Work to be completed in terms of money	1/8 th (Rs)	3/8 th (Rs)	3/4 th (Rs)	Full (Rs)
		C	Compensation payable by the Contractor for delay attributable to Contractor at the stage of	Delay up to one fourth period of the prescribed time span – 2.5% of the work remained unexecuted. Delay exceeding one fourth of the prescribed time span but not exceeding half of the prescribed time span - 5% of the work remained unexecuted. Delay exceeding half of the prescribed time span but not exceeding three fourth of the prescribed time span - 7.5% of the work remain unexecuted. Delay exceeding three fourth of the prescribed time span – 10% of the work unexecuted.			

Note-1: In case delayed period over a particular time span is split up and is jointly attributable to the Procuring Entity and the Contractor, the competent authority may reduce the compensation in proportion of delay attributable to the Procuring Entity over entire delayed period over that time span after clubbing up the split delays attributable to the Procuring Entity and this reduced compensation would be applicable over the entire delayed period without paying any escalation.

Note-2: The compensation, levied as above, shall be recoverable from the Payment Certificate payable after the concerned time span. The total compensation for delays shall, however, not exceed 10 percent of the total value of the Works.

c. The Contractor shall further be bound to carry out the work in accordance with the date and quantity entered in the progress statement attached to the Bid.

d. However, if a time schedule has been submitted by the Contractor before execution of the agreement, and it is entered in agreement as submitted or as modified by the Procuring Entity or the Engineer-in-Charge, the Contractor shall complete the Works within the said time schedule. In the event of the Contractor failing to comply with the time schedule, he shall be liable to pay compensation as prescribed in foregoing paragraph of this Sub-Clause. While granting extension in time attributable to the Procuring Entity, reasons shall be recorded for each delay.

e. The amount of compensation may be adjusted or set off against any sum payable to the Contractor under this or any Contract with the Procuring Entity. In case, the Contractor does not achieve a particular milestone mentioned in Contract Data or the rescheduled

		<p>milestone(s), the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of extension of time.</p> <p>f. Withholding of this amount on failure to achieve a milestone shall be automatic without any notice to the Contractor. However, if the Contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the Contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequent also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.</p> <p>g. If the Contract is completed in the original time period as agreed upon in the Contract, then the Liquidated Damages so imposed for delays of intermediate milestones will be adjusted/ paid. Also, price escalation shall not be applicable if Liquidated Damages have been imposed. However, if the Contractor finishes the work as per the original time period, he shall be eligible to receive the price escalation.</p>
Suspension of Work	8.10.1	The Engineer-in-charge may for recorded reasons, at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage. The Engineer-in-charge may also notify the cause for the suspension.
	8.10.2	<p>The Contractor shall, on receipt of the order in writing of the Engineer-in-Charge (whose decision shall be final and binding on the Contractor) suspend the progress of the Works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof, for any of the following reasons:</p> <ul style="list-style-type: none"> i. on account of any default on the part of the Contractor; or ii. for proper execution of the Works or part thereof for reasons other than the default of the Contractor; or iii. for safety of the Works or part thereof. <p>The Contractor shall, carry out the instructions given in that behalf by the Engineer-in-Charge.</p> <p>If the suspension is ordered for reasons ii and iii above, the Contractor shall be entitled to an extension of time equal to the period of every such suspension for completion of the item or group of items of work for which a separate period of completion is specified in the Contract and of which the suspended work forms a part,</p>

Consequences of Suspension	8.11	<p>If the Contractor suffers delay and/ or incurs Cost from complying with the Engineer-in-charge's instructions under Sub-Clause 8.10 [Suspension of Work] and/ or from resuming the work, the Contractor shall give notice to the Engineer-in-charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to:</p> <p>i. An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time for Completion], and</p> <p>ii. payment of any such Cost, which shall be included in the Contract Price.</p> <p>After receiving this notice, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.</p> <p>The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in making good the consequences of the Contractor's faulty design, workmanship or Materials, or of the Contractor's failure to protect, store or secure the work in accordance with Sub-Clause 8.10 [Suspension of Work].</p>
Payment for Plant and Materials in Event of Suspension	8.12	<p>The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/ or Materials which have not been delivered to Site, if:</p> <p>i. the work on Plant or delivery of Plant and/ or Materials has been suspended for more than 28 Days, and</p> <p>ii. The Contractor has marked the Plant and/ or Materials as the Procuring Entity's property in accordance with the Engineer-in-charge's instructions.</p>
Prolonged Suspension	8.13	<p>If the suspension under Sub-Clause 8.10 [Suspension Work]. has continued for more than 84 Days, the Contractor may request the Engineer-in-charge's permission to proceed. If the Engineer-in-charge does not give permission within 28 Days after being requested to do so, the Contractor may, by giving notice to the Engineer-in-charge, treat the suspension as an omission under Sub-Clause 9.2 [Deviations/ Variations Extent and Pricing] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 17.2 [Termination by Contractor].</p>
Resumption of Work	8.14	<p>After the permission or instruction to proceed is given, the Contractor and the Engineer-in-charge shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or Defect in or loss of the Works or Plant or Materials, which has occurred during the suspension after receiving from the Engineer-in-charge an instruction to this effect under Sub-Clause 9.2 [Deviations/ Variations, Extent and Pricing].</p>

Work to be executed strictly as per specifications	8.15	<p>All Works under or in course of execution or executed in pursuance of the Contract shall at all times be executed strictly as per specifications of the Contract as established by regular testing at the specified frequency and be open and accessible to the quality inspection and supervision of the Engineer-in-Charge, his authorized subordinates in charge of the work and all the superior officers, officers of the Quality Control Organization, Third Party Inspection Agency, if engaged by the Procuring Entity, and the Contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the Contractor, either himself be present to receive written orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the Contractor himself. All payments shall be linked to the specified quality of works and works failing on tests or not executed as per design, drawings and specifications shall not be paid unless rectified to the specified quality by the Contractor.</p>
Action when Work executed with unsound materials, imperfect and unskilled workmanship	8.16	<p>If it shall be established through regular testing or post execution quality testing by the third party quality inspection agency to the Engineer-in-Charge or his higher authority or his authorized subordinates in charge of the Works, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with Materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the Contract, the Contractor shall, on demand in writing from the Engineer-in-Charge specifying the work, Materials or articles complained of, notwithstanding that the same may have been passed, certified and paid for, forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the Materials or articles so specified and reconstruct, provide other proper and suitable Materials or articles at his own charge and Cost. In the event of the Contractor failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the Contractor shall be liable to pay compensation for the specified period, at the same rate as under Sub-Clause for non-completion of the work in time for this default.</p> <p>In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the Contract but may accept such items at reduced rates as the competent authority may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure and incidental items rectified, or removed and re-executed at the risk and cost of the Contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the Contractor.</p>

9. Deviations, variations and adjustments		
Right to Vary <i>(Additions and Alterations in case of Lump Sum Contract)</i>	9.1	<p>Variations may be initiated by the Engineer-in-charge at any time during the execution of the Works prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal.</p> <p>The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Engineer-in-charge stating (with supporting particulars) that:</p> <ul style="list-style-type: none"> i. the Contractor cannot readily obtain the Goods required for the Variation, or ii. such Variation triggers a substantial change in the sequence or progress of the Works. <p>Upon receiving this notice, the Engineer-in-charge shall cancel, confirm or vary the instruction.</p> <p>Each Variation may include:</p> <ul style="list-style-type: none"> i. changes to the quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation), ii. changes to the quality and other characteristics of any item of work, iii changes to the levels, positions and/ or dimensions of any part of the Works, iv. omission of any work unless it is to be carried out by others, v. any additional work, Plant, Materials or services necessary or incidental to the Works, including any associated Tests on Completion, boreholes and other testing and exploratory work, vi. Changes to the sequence or timing of the execution of the Works. <p>The Contractor shall not make any alteration and/ or modification of the Permanent Works, unless and until the Engineer-in-charge instructs or approves a Variation.</p>
Deviations/ Variations Extent and Pricing	9.2.1	<p>The Engineer-in-charge shall have power (i) to make alternations in, omissions from, additions to, or substitutions for the original Specifications, quantities, Drawings, designs and instructions that may be appear to him to be necessary or advisable during the progress of the Works, and (ii) to omit a part of the Works in case of non-availability of a portion of the Site or for any other reasons and the Contractor shall be bound to carry out the Works in accordance with any instructions given to him in writing signed by the Engineer-in-charge after approval from competent authority and such alterations, omissions, additions or substitutions shall form part of the Contract as if originally provided therein and any altered, additional or substituted work which the Contractor may be directed to do in the manner specified above as part of the Works, shall be carried out by the Contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.</p>

<p><i>(In case of Lump Sum Contract, Rates of measured up additions and alterations shall be as per applicable BSR or rates of Day Work given by the Contractor and forming part of the Contract)</i></p>	<p>9.2.2</p>	<p>The rates for such additional, altered or substituted works shall be determined in accordance with the following provisions:</p> <ol style="list-style-type: none"> If the rates for the additional, altered or substituted work are specified in the Contract for the Works, the Contractor is bound to carry out the additional, altered or substituted work at the same rates as are specified in the Contract for the Works. If the rates for the additional, altered or substituted work are not specifically provided in the Contract for the Works, such rates will be derived from the rates for a similar class of work as are specified in the Contract for the Works. If the rates for the additional, altered or substituted work cannot be determined in the manner specified in the sub-clauses i and ii above, then the rates for such composite work item shall be worked out on the basis of the concerned Schedule of Rates of the district/ area specified above minus/ plus the percentage which the total Bid amount bears to the estimated cost of the entire Works put to bid. Provided always that if the rate for such part or parts of the item is not in the Schedule of Rates, the rate for such part or parts will be determined by the Engineer-in-charge on the basis of the prevailing market rates when the work was done but the percentage of bid discount/ premium will not be subtracted/ added to such market rates. If the rates for the additional, altered or substituted work item cannot be determined in the manner specified in sub sub-clause I to iii above then the contractor shall within 7 days of the date of receipt of order to carry out the work, inform the Engineer-in-charge of the rate which it is his intention to charge for such class of work supported by analysis of the rate(s) claimed and the Engineer-in-charge shall determine the rate/ rates on the basis of prevailing market rates and pay the contractor accordingly. However, the Engineer-in-charge, by notice in writing, will be at liberty to cancel his order to carry out such class of work and arrange to carry it out in such manner as he may consider advisable but under no circumstances, the Contractor shall suspend the work on the plea of non-settlement of rates on items falling under this sub-clause.
	<p>9.2.3</p>	<p>The quantum of additional work for each item shall not exceed 50% of the original quantity of the item given in the Contract and the total value of additional, altered, and substituted items of work shall not exceed 50% of the Accepted Contract Price. <i>(This para is not applicable in case of Lump Sum Contract)</i></p>
	<p>9.2.4</p>	<p>The time for completion of the Works shall in the event of any deviations resulting in additional Cost over the Contract Price being ordered be extended if requested by the Contractor in the proportion which the additional Cost of the altered, additional or substituted work, bears to the original Contract Price. Similarly, the proportionate time period for an item of work deleted shall</p>

		be reduced from the total time period provided in the Contract.
Value Engineering	9.3	<p>The Contractor may, at any time, submit to the Engineer-in-charge a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the Cost to the Procuring Entity of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Procuring Entity of the completed Works, or (iv) otherwise be of benefit to the Procuring Entity</p> <p>The proposal shall be prepared at the Cost of the Contractor and shall include the items listed in Sub-Clause 9.2 [Deviations, Variations and Pricing].</p> <p>If a proposal, which is approved by the Engineer-in-charge, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:</p> <ol style="list-style-type: none"> the Contractor shall design this part, Sub-Clause 4.1 [Contractor's General Obligations] shall apply, and If this change results in a reduction in the Contract value of this part, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine a fee, which shall be included in the Contract Price.
No compensation for alterations in or restriction of works to be carried out	9.4	<p>If, at any time after the commencement of the Works, the Procuring Entity shall, for any reason, whatsoever, not require the whole Works, thereof, as specified in the Contract, to be carried out, the Engineer-in-charge shall give notice, in writing, of the fact to the Contractor, who shall have no claim to any payment or compensation, whatsoever, on account of any profit or advantage which he might have derived from the execution of the Works in full but which he did not derive in consequence of the full amount of the Works not having been carried out. Neither shall he have any claim for compensation by reason of alterations having been made in the original specifications, drawings and design and instructions, which shall involve any curtailment of the Works, as originally contemplated. Provided, that the contractor shall be paid the charges for the cartage only, of Materials actually brought to the Site of the Works by him for bonafide use and rendered surplus as a result of the abandonment or curtailment of the Works or any portion thereof, and taken them back by the Contractor, provided, however, that the Engineer-in-charge shall have, in all such cases, the option of taking over all or any such Materials at their purchase price or at local market rates whichever may be less. In the case of such stores, having been issued from Procuring Entity's Stores, charges recovered, including storage charges shall be refunded after taking into consideration any deduction for claim on account of any deterioration or damage while in the custody of the Contractor and in this respect the decision of the Engineer-in-charge shall be final.</p>
Monthly Return of Extra Claims	9.5.1	To facilitate timely resolution of Contractor's claims due against the orders/ instructions of the Engineer-in-Charge, the

		<p>Contractor shall submit every month along with the Intermediate Payment Claims, a comprehensive statement of claims raised by him for any work claimed as extra, up to the previous month and awaiting resolution by the Engineer-in-Charge and/ or Procuring Entity. Value of claims shall be based upon the rates and prices mentioned in the Contract or in the Schedule of Rates in force in the District/ Division/ Circle for the time being. The Engineer-in-Charge shall duly acknowledge it and proceed to act as per Sub-Clause 3.5 [Determinations]. He will communicate the resolution to the Contractor and also reasons for rejection to the Contractor's claims. The contractor shall be deemed to have waived all claims, not included in such return and will have no right to enforce any such claims not included, whatsoever be the circumstances.</p> <p>However, the Contractor shall continue performance on the Contract despite rejection of his claims by the Engineer-in-Charge. Such rejected claims may then be raised before the Dispute Resolution Board or the Arbitration Tribunal, as appropriate.</p>
	9.5.2	The Contractor shall send to the Engineer-in-Charge once every three Months an up to date account giving complete details of all claims for additional payments to which the Contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge after approval from competent authority which he has executed during the preceding quarter .
	9.5.3	Any operation or procedure incidental to or necessary to the execution of the Works has to be in contemplation of Bidder while submitting his Bid, whether or not, specifically indicated in the description of the item and the relevant Specifications, shall be deemed to be included in the rates quoted by the Bidder or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations/ procedures.
Provisional Sums	9.6	<p>Each Provisional Sum shall only be used, in whole or in part, in accordance with the Engineer-in-charge's instructions and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Engineer-in-charge shall have instructed. For each Provisional Sum, the Engineer-in-charge may instruct:</p> <ul style="list-style-type: none"> i. work to be executed (including Plant, Materials, labour or services to be supplied) by the Contractor and valued; and/ or ii. Plant, Materials or services to be procured by the Contractor from a Nominated Sub-Contractor as defined in Sub-Clause 5.2 [Nomination of Sub-Contractor] or otherwise; and for which there shall be included in the Contract Price: <ul style="list-style-type: none"> (a) the actual amounts paid (or due to be paid) by the Contractor, and (b) A sum for overhead charges, calculated at 10% percent

		<p>of these actual amounts.</p> <p>The amount of overheads (10%) shall be subject to tax liability as per law.</p> <p>The Contractor shall, when required by the Engineer-in-charge, produce invoices, vouchers and accounts or receipts in substantiation.</p>
Day Work	9.7	<p>For works of a minor or incidental nature, the Engineer-in-charge may instruct that a Variation shall be executed on a Day work basis. The work shall then be valued in accordance with the Day work Schedule included in the Contract, and the following procedure shall apply. If a Day work Schedule is not included in the Contract, this Sub-Clause shall not apply.</p> <p>Before ordering materials for the work, the Contractor shall submit quotations to the Engineer-in-charge. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Materials/ Equipment/ Plant/ Temporary Works.</p> <p>Except for any items for which the Day work Schedule specifies that payment is not due, the Contractor shall deliver each day to the Engineer-in-charge accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:</p> <ul style="list-style-type: none"> i. the names, occupations, day wages and required time period of Contractor's Personnel, ii. the identification, type and time of Contractor's Equipment and Temporary Works, and iii. The quantities and types of Plant and Materials used. <p>One copy of each statement will, if correct, or when agreed, be signed by the Engineer-in-charge and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer-in-charge, prior to their inclusion in the next Statement under Sub-Clause 15.5 [Issue of Interim Payment Certificates].</p>
10. Price Variation		
Price Variation due to changes in the prices of labour, materials, bitumen, petroleum, cement and steel	10.1	<p>If, during the progress of the contract of value exceeding Rs. 50 lakh (accepted Contract Price minus cost of material supplied by the Procuring Entity), and where stipulated completion period is more than 3 months (both the conditions should be fulfilled), the price, of any materials/ bitumen/ diesel and petrol/ cement/ steel incorporated in the Works (not being materials to be supplied by the Procuring Entity) and/ or wages of labour increases or decreases, as compared to the price and/ or wages prevailing at the date of opening of bids or date of negotiations for the Works, the amounts payable to Contractor for the Works shall be adjusted for increase or decrease in the rates of materials (excepting those materials supplied by the Procuring Entity)/ labour/ bitumen /diesel and petrol/ cement/ steel. If negotiated rates have been accepted, prices as on the date of negotiation</p>

		<p>shall be considered for price adjustment. Similarly, if rates received on the date of opening of bids have been accepted, then prices on the date of opening of bids shall be considered for price adjustment.</p> <p>Increase or decrease in the cost of labour/ material/ diesel and petrol/ cement/ steel shall be calculated quarterly and cost of bitumen shall be calculated on monthly basis in accordance with the following formula:-</p> <p>(A) Labour</p> $V_L = 0.75 \times \frac{P_L}{100} \times R \times \frac{(I_{L1} - I_{L0})}{I_{L0}}$ <p>Where,</p> <p>V_L = Increase or decrease in the cost of Works during the quarter under consideration due to change in rates for labour.</p> <p>R = The value of the Works done in rupees during the quarter under consideration excluding the cost of materials supplied by the Procuring Entity and excluding other items as mentioned in this Sub-Clause.</p> <p>I_{L0} = The average consumer price index for industrial workers (whole-sale prices) for the quarter in which bids were opened/ negotiated (as published in Reserve Bank of India Journal/ Labour Bureau Simla, for the area).</p> <p>I_{L1} = The average consumer price index for industrial workers (whole-sale prices) for the quarter of calendar year under consideration (as published in Reserve Bank of India Journal/ Labour Bureau Simla, for the area).</p> <p>P_L = Percentage of labour components.</p> <p>Note: In case of revision of minimum wages by the Government or other competent authority, nothing extra would be payable except the price escalation permissible under this Sub-Clause.</p> <p>(B) Materials (excluding materials supplied by the Procuring Entity).</p> $V_M = 0.75 \times \frac{P_M}{100} \times R \times \frac{(L_{M1} - L_{M0})}{L_{M0}}$ <p>Where,</p> <p>V_M = Increase or decrease in the cost of Works during the quarter under consideration due to change in rates for materials.</p> <p>R = The value of the Works done in rupees during the quarter under consideration excluding the cost of materials supplied by the Procuring Entity and excluding other items as mentioned in this Sub-Clause.</p> <p>L_{M0} = The average wholesale price index (all commodities) for</p>
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Price Variation in installation of elevators, supply/installation of Centrally Air Conditioning and Central Evaporating Cooling Works.	10.2	<p>In all cases of contracts for installation of elevators, supply/ installation of Central Air Conditioning and Central Evaporating Cooling Works, the price quoted shall be based on the Indian Electrical and Electronics Manufacturers Association (IEEMA) price variation Sub-Clause based on the cost of raw materials/ components and labour cost as on the date of quotation/ bid, and the same is deemed to be related to wholesale price index number of metal products and All India Average consumer price index number of industrial workers as specified below. In case of any variation in these index numbers, the prices shall be subject to adjustment up or down in accordance with following formula:</p> $P = \frac{P_0}{100} \left[15 + 55 \frac{MP}{MP_0} + 15 \frac{W_0(D)}{W_0} + 15 \frac{W_0(1)}{W_0} \right]$ <p>Where,</p> <p>P = Price payable as adjusted in accordance with the above price variation formula.</p> <p>P_0 = Price quoted/ confirmed.</p> <p>MP_0 = Wholesale Price Index Number for Metal Products as published by the office of the Economic Adviser, Ministry of Industry, Government of India, in their weekly bulletin, Revised Index Number of Wholesale Prices (Base: 1981- 82 = 100) for the week ending first Saturday of the relevant calendar month. The relevant month shall be that in which price was offered or negotiated whichever is later.</p> <p>W_0 = All India Average Consumer Price Index Number for Industrial workers (Base : 1982 = 100), as published by Labour Bureau, Ministry of Labour, Government of India, for relevant calendar month. The relevant month shall be that in which price was offered or negotiated whichever is later.</p> <p>The above index number MP_0 & W_0 are those published by IEEMA as prevailing on the first working day of the calendar month FOUR months prior to the date of bidding.</p> <p>MP = Wholesale Price Index Number for Metal Products as published by the office of the Economic Adviser, Ministry of Industry, Government of India, in their weekly bulletin</p>

		<p>Revised Index Number of Wholesale Prices (Base: 1981-82 = 100). The applicable wholesale price Index Number for Metal Products as prevailing on 1st Saturday of the month covering the date FOUR months prior to the date of delivery and would be as published by IEEMA.</p> <p>$W_o(D)$ = All India Average Consumer Price Index Number for Industrial Workers prevailing for the month covering the date FOUR months prior to the date of delivery of manufactured material and would be as published by IEEMA.</p> <p>$W_o(1)$ = All India Average Consumer Price Index Number for Industrial Workers (Base : 1982 = 100) as published by Labour Bureau, Ministry of Labour, Government of India. The applicable All India Consumer Price Index Number of Industrial Workers prevailing for the FOUR months prior to the date of completion of installation/ progress parts of installation and would be as published by IEEMA. The date of delivery shall be the date on which the manufactured material is actually supplied at Site. The date of completion of installation (or progress part of installation) shall be the date on which the Works is notified as being completed and is available for inspection/ duly tested. In the absence of such notification, the date of completion is not intimated, such completion shall be considered by the Engineer Incharge which shall be final.</p> <p>Note-1 The Wholesale Price Index Number for Metal Products is published weekly by the office of the Economic Adviser, but if there are any changes, the same are incorporated in the issue appearing in the following week. For the purpose of this Price Variation Sub-Clause, the final index figures shall apply.</p> <p>Note-2 The sole purpose of the above stipulation is to arrive at the entire Contract under the various situations. The above stipulation does not indicate any intentions to sell materials under this Contract as movables.</p> <p>Note-3 The indices MP & W_o are regularly published by IEEMA in monthly basic price circulars based on information bulletins from the authorities mentioned. These will be used for determining price variation and only IEEMA Circulars will be shown as evidence, if required.</p>
General Conditions for admissibility of Price Variation	10.3	The General Conditions for admissibility of Price Variation are given in Appendix A to these General Conditions.
11. Tests on completion		
Contractor's obligations	11.1	The Contractor shall carry out the Tests on Completion in accordance with the BIS/ IRC and other standard codes and Sub-Clause 7.9 [Testing], after providing the documents in accordance with the requirements for tests on completion.

		<p>The Contractor shall give to the Engineer-in-charge not less than 15 Days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 7 Days after this date, on such day or Days as the Engineer-in-charge shall instruct.</p> <p>In considering the results of the Tests on Completion, the Engineer-in-charge shall make allowances for the effect of any use of the Works by the Procuring Entity on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor shall submit a certificate of the results of these Tests to the Engineer-in-charge.</p>
Delayed Tests	11.2	<p>If the Tests on Completion are being unduly delayed by the Engineer-in-charge, Sub-Clause 7.9.2 of 7.9 [Testing] shall be applicable.</p> <p>If the Tests on Completion are being unduly delayed by the Contractor, the Engineer-in-charge may by notice require the Contractor to carry out the Tests within 21 Days after receiving the notice. The Contractor shall carry out the Tests on such day or Days within that period as the Contractor may fix and of which he shall give notice to the Engineer-in-charge.</p> <p>If the Contractor fails to carry out the Tests on Completion within the period of 21 Days, the Procuring Entity's/ Engineer-in-Charge's Personnel may proceed with the Tests at the field laboratory or at an outsourced laboratory at the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate and binding on the Contractor.</p>
Retesting	11.3	<p>If the Works, or a Section, fails to pass the Tests on Completion, Sub-Clauses 7.13 [Rejection] and 11.4 [Failure to Pass Tests on Completion] shall apply, and the Engineer-In-Charge or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.</p>
Failure to Pass Tests on Completion	11.4	<p>If the Works, or a Section, fails to pass the Tests on Completion repeated under Sub-Clause 11.3 [Retesting], the Engineer-in-Charge shall be entitled to:</p> <ul style="list-style-type: none"> i. Order further repetition of Tests on Completion; ii. If failure deprives the Procuring Entity of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Procuring Entity shall have the same remedies as provided in Sub-paragraph (c) of Sub-Clause 13.6 [Failure to Remedy Defect]; or iii. Issue a Taking-Over Certificate, if the Procuring Entity so requires.

		<p>In the event of Sub-para iii, the Contractor shall proceed in accordance with all other obligations under the Contract, and the Contract Price shall be reduced by such amount as shall be appropriate to cover the reduced value to the Procuring Entity as a result of this failure. Unless the relevant reduction for this failure is stated (or its method of calculation is defined) in the Contract, the Procuring Entity may require the reduction to be (i) agreed by the Contractor (in full satisfaction of this failure only) and paid before this Taking-Over certificate is issued, or (ii) determined and paid under Sub-Clause 3.5 [Determinations].</p>
12. Taking over of the Works and Sections by Procuring Entity		
Taking over of works.	12.1	<p>Except as stated in Sub-Clause 11.4 [Failure to Pass Tests on Completion], the Works shall be taken over by the Procuring Entity when (a) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.4 [Time for Completion] and except as allowed in subparagraph i. below, and (b) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.</p> <p>The Contractor may apply by notice to the Engineer-in-charge for a Taking-Over Certificate not earlier than 14 Days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contractor may similarly apply for a Taking-Over Certificate for each Section.</p> <p>The Engineer-in-charge shall, within 28 Days after receiving the Contractor's application:</p> <ol style="list-style-type: none"> issue the Taking-Over Certificate to the Contractor, stating the date on which the Works or Section was completed in accordance with the Contract, except for any minor outstanding work and Defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these Defects are remedied); or reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under this Sub-Clause. <p>If the Engineer-in-charge fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 28 Days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.</p>
Taking over of Parts of the Works	12.2	<p>The Engineer-in-charge may, at the sole discretion of the Procuring Entity, issue a Taking-Over Certificate for any part of the Permanent Works.</p>

		<p>The Procuring Entity shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Engineer-in-charge has issued a Taking-Over Certificate for this part. However, if the Procuring Entity does use any part of the Works before the Taking-Over Certificate is issued:</p> <ol style="list-style-type: none"> the part which is used shall be deemed to have been taken over as from the date on which it is used, the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Procuring Entity, and if requested by the Contractor, the Engineer-in-charge shall issue a Taking-Over Certificate for this part. <p>After the Engineer-in-charge has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period.</p> <p>If the Contractor incurs Cost as a result of the Procuring Entity taking over and/ or using a part of the Works, other than such use as is specified in the Contract or agreed by the Contractor, the Contractor shall:</p> <p>(a) give notice to the Engineer-in-charge, and (b) be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to payment of any such Cost, which shall be included in the Contract Price. After receiving this notice, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this Cost.</p> <p>If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages thereafter for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the case may be) as a whole. The Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these proportions. The provisions of this paragraph shall only apply to the rate of delay damages under Sub-Clause 8.9 [Compensation/ Damages for Delay], and shall not affect the maximum amount of these damages.</p>
Taking over if Tests on Completion	12.3	<p>If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Procuring Entity is responsible, the Procuring Entity shall be</p>

suffer Interference		<p>deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.</p> <p>The Engineer-in-charge shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Engineer-in-charge shall require the Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.</p> <p>If the Contractor suffers delay and/ or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Engineer-in-Charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to:</p> <ul style="list-style-type: none"> i. an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of time for Completion], and ii. payment of any such Cost, which shall be included in the Contract Price. <p>After receiving this notice, the Engineer-in-Charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.</p>
Surfaces Requiring Reinstatement	12.4	Except as otherwise states in a Taking Over Certificate, a Certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.
13. Defect Liability		
Defect Liability Period	13.1	It is the period, as specified in the Contract data, after certified total completion or after a suspension (short or prolonged) or termination of the Works by the Engineer-in-Charge or the Contractor and handing over of the Works (including Sections or parts handed over earlier) to the Engineer-in-Charge, during which the Contractor is responsible for remedying/ repairing, restoring to the original condition any apparent, virtual or observed defects, deficiencies in the Works, or its performance. The Contractor shall have to repair & restore the defect/ deficiency after a notice issued by the Engineer-in-Charge, who will be free to get it remedied at the risk and cost of the Contractor besides other action being taken as per the Contract, if the Contractor does not get it remedied within the period specified in such notice. The attendances to normal wear and tear due to use by the Procuring Entity/ occupier, in respect of sections or parts taken over for the convenience of the Procuring Entity, shall not be treated as defect.
Completion of Outstanding Work and Remedying	13.2	In order that the Works and Contractor's Documents, and each Section, shall be in the condition required by the Contract (fair wear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable thereafter,

Defects.		<p>the Contractor shall:</p> <ol style="list-style-type: none"> complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer-in-charge, and Execute all work required to remedy Defects or damage, as may be notified by (or on behalf of) the Procuring Entity on or before the expiry date of the Defects Notification Period for the Works. <p>If a Defect appears or damage occurs, the Contractor shall be notified accordingly, by (or on behalf of) the Procuring Entity. The Contractor is required to repair, rectify, the defects, restore the damages at his own cost within the period indicated in the notice by the Procuring Entity. If the Contractor fails to do so, action as per Sub-Clause 13.3 shall be taken.</p>
Cost of Remedying Defects	13.3	<p>All work referred to in Sub-Clause 13.2 above [Completion of Outstanding Work and Remedying Defects] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:</p> <ol style="list-style-type: none"> any design for which the Contractor is responsible, Plant, Materials or workmanship not being in accordance with the Contract, or Failure by the Contractor to comply with any other obligation. <p>The cost to be debited shall be arrived at as under:</p> <ol style="list-style-type: none"> Cost of remedial work (including taxes) as paid to other agency or debited to the contractor if the remedial action is taken up by the department/ organisation, plus A compensation of 15% , less Credit the cost of materials, hire charges of Contractor's plant and machinery if used in the remedial work. <p>If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Procuring Entity and Sub-Clause 9 [Deviations, Variations and Adjustments] shall apply.</p>
Extension of Defects Notification Period	13.4	<p>The Procuring Entity shall be entitled subject to Sub-Clause 2.5 [Procuring Entity's Claims] to an extension of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of work (as the case may be, and after taking over) cannot be used for the purposes for which they are intended by reason of a Defect, deficiency or by reason of damage attributable to the Contractor. However, a Defects Notification Period shall not be extended by more than two years.</p> <p>If delivery and/ or erection of Plant and/ or Materials was suspended under Sub-Clause 8.10 [Suspension of Work] or Sub-Clause 17.1 [Contractor's Entitlement to Suspend Work], the</p>

		Contractor's obligations under this Sub-Clause shall not apply to any Defects or damage occurring more than two years after the Defects Notification Period for the Plant and/ or Materials would otherwise have expired.
Contractor liable for Damages done and for Imperfections	13.5	<p>If the Contractor or his personnel shall break, deface, injure or destroy any part of a building or any structure in which they may be working, or any building, road, fence, enclosure, water pipe, power/ telecom cables, drains, electric or telephone post or wires, trees, etc. or cultivated ground contiguous to the Site where the Works or any part of it is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults or imperfection appear in the work within Defect Liability Period after a certificate final or otherwise of its completion shall have been given by the Engineer-in-Charge as aforesaid arising out of Defect or improper Materials, procedures or workmanship the Contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by employing other workman/ agency and deduct the expense from any sums that may be due or at any time thereafter may become due to the Contractor, or from his Performance Security or the proceeds of sale thereof or a sufficient portion thereof.</p>
Failure to remedy the defect	13.6	<p>If the Contractor fails to remedy any Defect, deficiency or damage within a reasonable time, a date may be fixed by (or on behalf of) the Procuring Entity, on or by which the Defect, deficiency or damage is to be remedied. The Contractor shall be given reasonable notice of this date.</p> <p>If the Contractor fails to remedy the Defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 13.3 [Cost of Remedying Defects], the Procuring Entity may (at his option):</p> <ol style="list-style-type: none"> carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay to the Procuring Entity the costs reasonably incurred by the Procuring Entity in remedying the Defect or damage; require the Engineer-in-charge to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [Determinations]; or If the Defect or damage deprives the Procuring Entity of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Procuring Entity shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing Costs and the Cost of

		dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.
Removal of Defective Work	13.7	If the Defect or damage cannot be remedied expeditiously on the Site and the Procuring Entity gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are Defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement Cost of these items, or to provide other appropriate security.
Further Tests	13.8	<p>If the work of remedying of any Defect or damage may affect the performance of the Works, the Engineer-in-charge may require the repetition of any of the tests described in the Contract. The requirement shall be made by notice within 28 Days after the Defect or damage is remedied.</p> <p>These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 13.3 [Cost of Remedying Defects], for the cost of the remedial work.</p>
Contractor / Third Party Quality Inspection Agency to Search for the Cause of the Defect.	13.9	The Contractor or third party quality inspection agency shall, if required by the Engineer-in-charge, search for the cause of any Defect, under the direction of the Engineer-in-charge. Unless the Defect is to be remedied at the cost of the Contractor under Sub-Clause 13.3 [Cost of Remedying Defects], the cost of the search shall be agreed or determined by the Engineer-in-charge in accordance with Sub-Clause 3.5 [Determinations] and shall be included in the Contract Price or of the third party quality inspection agency.
Performance Certificate	13.10	<p>Performance of the Contractor's obligations shall not be considered to have been completed until the Engineer-in-charge has issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.</p> <p>The Engineer-in-charge shall issue the Performance Certificate within 28 Days after the latest of the expiry dates of the Defects Liability Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any Defects. A copy of the Performance Certificate shall be issued to the Procuring Entity.</p> <p>Only the Performance Certificate shall be deemed to constitute acceptance of the Works.</p>
Substantial Completion of Parts	13.11	If any part of the Permanent Works has been substantially completed and has satisfactorily passed any Test on Completion prescribed by the Contract, the Engineer-in-charge may issue a Taking-Over Certificate in respect of that part of the Permanent Works before completion of Works and upon the issue of such

		Certificate, the Contractor shall be deemed to have undertaken to complete with due expedition any outstanding work in that part of the Permanent Works during Defect Liability Period.
Unfulfilled Obligations	13.12	After the Performance Certificate has been issued, each Party shall remain liable for the fulfillment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.
Right to Access	13.13	Until the Performance Certificate has been issued, the Contractor shall have such right of access to the Works as is reasonably required in order to comply with this Sub-Clause, except as may be inconsistent with the Procuring Entity's reasonable security restrictions.
Clearance of Site	13.14	<p>Upon receiving the Performance Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.</p> <p>If all these items have not been removed within 28 days after receipt by the Contractor of the Performance Certificate, the Procuring Entity may sell or otherwise dispose of any remaining items. The Procuring Entity shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.</p> <p>Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Procuring Entity's costs, the Contractor shall pay the outstanding balance to the Procuring Entity.</p>
14. Measurement and Evaluation. (In case of Lump Sum Contract measurement of only additions and alterations shall be taken)		
Measurement of Work Done	14.1	<p>Whenever the Engineer-in-charge requires any part of the Works to be measured/ re-measured, reasonable notice shall be given to the Contractor's Representative, who shall:</p> <ol style="list-style-type: none"> promptly either attend or send another qualified representative to assist the Engineer-in-charge in taking/ verifying the measurement, and Supply any particulars requested by the Engineer-in-charge for his satisfaction of the measurements. <p>If the Contractor fails to attend or send a representative, the measurement made by (or on behalf) of the Engineer-in-charge shall be accepted as accurate.</p>
Method of measurement.	14.2.1	The measurements (as per IS 1200) of the executed and acceptable work shall be recorded once in a month by the representative of the Engineer-in-Charge and the Contractor or his representative jointly and shall be signed by the Contractor in acceptance. The Engineer-in-Charge shall, except as otherwise provided, shall check, ascertain and determine measurement and

		<p>the value of the work done in accordance with the Contract. The Procuring Entity reserves to itself the right to prescribe a scale of check measurements of work, in general, or a specific scale for specific works or by other special orders (about which the decision of the Procuring Entity shall be final). Checking of measurement by a superior officer shall supersede the measurements taken by the subordinate officers and the former will become the basis of the payment. Any excess payments detected, as a result of such check measurement or otherwise at any stage upto the date of completion and the Defect Liability Period specified elsewhere in this Contract, shall be recoverable from the Contractor as any other dues payable to the Procuring Entity.</p> <p>The Contractor shall, without extra charge, provided all necessary assistance with labour and equipment necessary for measurements and recording levels.</p> <p>If the Contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties.</p>
	14.2.2	<p>All measurement of all items having financial value shall be recorded in Measurement Book or MS Excel file and printed out in two copies. The original shall be treated as the Measurement book. Such files in original shall be mailed to the Engineer-in-Charge and shall be saved with a dedicated password. Other data like initial field levels or survey field books or findings of the geotech investigations shall be similarly recorded and protected so that a complete record is obtained of all works performed under the Contract.</p>
	14.2.3	<p>If for any reason the Contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-charge or his representative, the Engineer-in-Charge and the Department/ Organisation shall not entertain any claim from Contractor for any loss or damages on this account. If the Contractor or his authorized representative does not remain present at the time of such measurements after the Contractor or his authorized representative has been given a notice in writing three (3) Days in advance or fails to countersign or to record objection within seven days from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-charge or his representative shall be deemed to have been accepted by the Contractor.</p> <p>Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken of the net actual quantities in accordance with the procedure set forth in the Bill of Quantities and IS 1200 notwithstanding any general or local practice.</p> <p>The Contractor shall give not less than seven Day's notice to the Engineer-in-Charge or his authorized representative in charge of</p>

		<p>the Works before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimension thereof be taken before the same is covered up or placed beyond the reach of measurements and shall not cover and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the Works who shall within the aforesaid period of seven Days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-charge's consent being obtained in writing, the same shall be uncovered at the Contractor's expense, for the due measurement or in default thereof no payment or allowance shall be made for such works or the materials with which the same was executed. The covering shall then be restored by the Contractor at his cost.</p> <p>Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the Department/ Organisation to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.</p> <p>It is also a term of this Contract that recording of measurements of any item of work in the measurement sheets/ Measurement book and/ or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates, nor shall it relieve the Contractor from liabilities from any other measurement, Defects noticed till completion of the Defects liability period.</p>
Omissions	14.3	<p>Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:</p> <ul style="list-style-type: none"> i. the Contractor will incur (or has incurred) Cost which, if the work had not been omitted, would have been deemed to be covered by a sum forming part of the Accepted Contract Amount; ii. the omission of the work will result (or has resulted) in this sum not forming part of the Contract Price; and iii. this Cost is not deemed to be included in the evaluation of any substituted work; then the Contractor shall give notice to the Engineer-in-charge accordingly, with supporting particulars. Upon receiving this notice, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this Cost, which shall be included in the Contract Price.
15. Contract Price, Payment and Lien		
Contract price	15.1	<p>Unless otherwise stated in the Particular Conditions:</p> <ul style="list-style-type: none"> i. the Contract Price shall be agreed or determined and be subject to adjustments in accordance with the Contract; ii. the Contractor shall pay all taxes, duties and fees required to

		<p>be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these Costs except as stated in Sub-Clause 15.21 [Adjustments for Changes in Legislation] or Price adjustment;</p> <p>iii. any quantities which may be set out in the Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities:</p> <p>(a) of the Works which the Contractor is required to execute, or</p> <p>(b) for the purposes of Sub-Clause 11 [Measurement and Evaluation]; and</p> <p>iv. the Contractor shall submit to the Engineer-in-charge, within 28 Days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules. The Engineer-in-charge may take account of the breakdown when preparing Payment Certificates, but shall not be bound by it.</p>
Lump sum provisions in Estimate/Contract	15.2	<p>When the estimate includes lump sum provisions primarily in respect of parts of work/ items whose specifications and costs are not known at the time of framing the Estimate, and if a bid is to be invited on such an estimate, such lump sum shall be excluded from the bid.</p> <p>Subsequently, when the specifications and costs of such items are known, their execution, if to be completed concurrently with the Contract, shall either be done as a variation item or on market rates (without bid premium) of the Contract. Such variation should be approved by the competent authority and then the Contractor shall be entitled to payment in respect of such items of work, or separate bids shall be invited for the work to be executed concurrently with the present Contract.</p>
Schedule of Payments <i>(in case of Lump Sum Contract payments shall be linked to various stages of completion of Works given in the Activity Schedule)</i>	15.3	<p>The schedule of payments shall be as included in the Contract. If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 28 Days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works. The percentage quoted in the Bid and accepted in the Contract will be deducted/added from/to the gross amount of the bill.</p>
Application for Interim Payment Certificates (Running Account Bills)	15.4	<p>The Contractor shall submit a Statement in required number of copies to the Engineer-in-Charge after the end of each month, in a form approved by the Engineer-in-Charge, showing in detail the amounts to which the Contractor considers himself to be entitled on the basis of measurement (or Activity Schedule in case of Lump sum Contract) and advance payment, secured advance, deductions, etc. as applicable, together with supporting documents which shall include the report on the progress during this month in accordance with Sub-Clause 4.20 [Progress Reports].</p>

Issue of Interim Payment Certificates	15.5	<p>No amount will be certified or paid until the Procuring Entity has received and accepted the Performance Security. Thereafter, the Engineer-in-charge shall, within 28 Days after receiving a Statement and supporting documents, deliver to the Procuring Entity and to the Contractor an Interim Payment Certificate which shall state the amount which the Engineer-in-charge fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Engineer-in-charge on the Statement, if any.</p> <p>However, prior to issuing the Taking Over Certificate for the Works, the Engineer-in-charge shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificate (if any) stated in the Contract Data. In this event, the Engineer-in-charge shall give notice to the Contractor accordingly.</p> <p>An Interim Payment Certificate shall not be withheld for any other reason, although:</p> <ol style="list-style-type: none"> if anything supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer-in-charge, the value of this work or obligation may be withheld until the work or obligation has been performed. <p>The Engineer-in-charge may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer-in-charge's acceptance, approval, consent or satisfaction.</p>
Payment of an Interim Payment Certificate	15.6.1	<p>A bill shall be submitted by the Contractor each month on or before the date fixed by the Engineer-in-charge for all work executed in the previous month and the Engineer-in-charge shall take or cause to be taken or check the requisite measurement for the purpose of having the same verified and the claim, as far as admissible, authorized or paid, if possible, before the expiry of thirty days from the presentation for the bill. If the contractor does not submit the bill within the time fixed, as aforesaid, the Engineer-in-charge may depute a subordinate to measure up the said work in the presence of the Contractor, whose signature in the Measurement Book or sheet will be sufficient warrant and the Engineer-in-charge may prepare a bill from such Measurement Book, which shall be binding on the Contractor in all respects.</p>
Payment at Part Rates	15.6.2	<p>The rates for several items of works may be paid in part rates provisionally in running bills in proportion to the quantum of items executed as per specifications at the discretion of the</p>

		<p>Engineer-in-charge. The deferred payment, will however, be released after the successful completion of the item of work.</p> <p>In case of item rates, if the rate quoted for certain items is very high in comparison to the average/overall bid value over the estimated cost of the work, the payment at running stages shall not be made until an appropriate additional performance security for items for which rates have been quoted high, has been submitted by the Contractor. This security shall be refunded at the final stage of completion.</p>
Payment at Reduced Rates	15.6.3	In case certain item of the Works has not been executed as per specifications, design, drawings and the specified durability and the Engineer-in-Charge is not convinced to accept the item of Works at the full rate applicable under the Contract, may accept such item at a reduced rate (in proportion to the designed and executed capability and or the designed and assessed service life of the structure and its components) with a minimum reduction of 25% of the full rate during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the whole Works. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the Contractor.
Recovery of Cost of Water and Electricity consumed by the Contractor	15.6.4	The cost of all water connections necessary for the execution of Works, and the cost of water consumed and hire charges of meters and the cost of electricity consumed in connection with the execution of the Works shall be paid by the Contractor except where otherwise specifically provided in the Contract Data.
Recovery of materials issued and hire charges of Machinery and Equipment, etc.	15.6.5	Recoveries on account of materials issued to the Contractor by the Procuring Entity, Machinery and Equipment lent on hire, advance payment, secured advance, etc. or on any other account, and dues shall be made from each payment certificate from the Contractor as per conditions of this Contract.
Payment on Intermediate Certificate to be regarded as Advances	15.7	All interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or Materials delivered forming part of such payment may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or Materials to which it relates is/are in accordance with the Contract and Specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the Contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the Contract.
Application for	15.8	The Contractor shall apply to the Engineer-in-Charge for issue of

issue of final completion certificate		the Final Completion Certificate at least 45 days in advance of the likely date of full/ satisfactory completion. The Engineer-in-Charge during this period shall review and finalise the requirements of work to qualify as final completion with respect to the third party quality inspection agency reports, if any. The Final completion certificate shall be issued within 30 days of its becoming due as per notice.
issue of final completion certificate	15.9	After the Contractor has rectified all deficiencies pointed out by the Engineer-in-Charge in the final payment documents, and complied to all observations of the Third Party Quality Inspection Agency and the Independent Engineer to the entire satisfaction of the Engineer-in-Charge, the Contractor shall apply to the Engineer-in-Charge releasing the final payment as per final statement and also issue a final payment certificate. The Engineer-in-Charge shall proceed to issue the final payment certificate after reviewing all tests on completion, determinations, as built design and drawings, and other compliances required under the Contract.
Final Statement of payments	15.10	<p>Within 28 Days after receiving the Taking Over Certificate for the Works, the Contractor shall submit to the Engineer-in-charge, six copies of a draft final statement with as built drawings (with two soft copies also) and all other supporting documents showing in detail in a form approved by the Engineer-in-charge the value of all work done in accordance with the Contract, and any further sums which the Contractor considers to be due to him under the Contract or otherwise.</p> <p>If the Engineer-in-charge disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer-in-charge may reasonably require within 28 Days from receipt of said draft and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer-in-charge the final statement as agreed. This agreed statement is referred to in these Conditions as the “Final Statement”.</p> <p>However if, following discussions between the Engineer-in-charge and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer-in-charge shall deliver to the Procuring Entity’s competent authority (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement.</p>
Discharge	15.11	When submitting the Final Statement, the Contractor shall submit a discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the outstanding balance of this total, in which event the discharge shall be effective on such date.

Payment of Final Bill	15.12	<p>The final value of the acceptable works done, less payments already received, value of claims raised and paid, value of claims not paid alongwith Interim Payment Certificates, final statement of price escalation due and paid, etc. shall be submitted by the Contractor along with the Final Bill. The final bill shall be submitted by the Contractor in the same manner as specified in interim bills within three Months of physical completion of the work or within one month of the date of the final certificate of completion issued by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the Contractor after submission of the final bill and these shall be deemed to have been waived and extinguished.</p> <p>Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within a period of 90 days, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge complete with accounts of advances, Materials issued, Machinery & Equipment lent on hire by the Procuring Entity, dismantled Materials, etc.</p>
Recovery of cost of preparation of the bill	15.13	<p>In case the Contractor does not submit the bill within the time fixed, the Engineer-in-charge may prepare the bill as per provision of Sub-Clause 15.6.1 [Payment of an Interim Payment Certificate] but a deduction @ 0.5 % of the amount of such a bill shall be made and credited to the general revenue account of the Department/ Organisation on account of preparation of the bill.</p> <p>The Contractor shall submit all bills on the printed forms, to be had on application, at the office of the Engineer- in- charge and the charges in the bills shall always be entered at the rates specified in the Contract or in the case of any extra work ordered in pursuance of these conditions, and not mentioned or provided for in the Contract, at the rates approved for such work.</p>
Payment of Contractor's Bills to Banks	15.14	<p>Payments due to the Contractor may, if so desired by him, be made to his Bank instead of direct to him provided that the Contractor furnishes to the Engineer-in-Charge (i) the account number with name and address of branch of the Bank, (ii) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the Bank to receive payments, and (iii) his own acceptance of the correctness of the amount made out as being due to him by Procuring Entity or his signature on the bill or other claim preferred against Procuring Entity before settlement by the Engineer-in-Charge of the account or claim by payment to the Bank. While the receipt given by such copy of Banks statement shall constitute a full and sufficient discharge for the payment, the Contractor shall also acknowledge with a receipt. Wherever possible the Contractor shall present his bills duly receipted and discharges through his Bankers.</p>

		Nothing herein contained shall operate to create in favour of the Bank any rights or equities vis.-a-vis. the Procuring Entity/ Governor of Rajasthan.
Advance Payments	15.15	No provision of advance
Secured Advance on Non-Perishable Materials <i>(Not applicable in case of Lump Sum Contract)</i>	15.16	The Contractor, on signing an indenture in the form to be specified by the Engineer-in-Charge, may be paid during the progress of the execution of the work, up to 75% of the assessed value of any Materials which have been actually brought at the Site and which, in the opinion of the Engineer-in-charge, are non-perishable, non-fragile and non-combustible and will be consumed in the Works within next three months in accordance with the construction programme and the Contract provided that they are adequately stored and/ or protected against damage by weather or other causes but which have not, at the time of granting advance, been incorporated in the Works. When Materials on account of which advance has been made under this Sub-Clause are incorporated in the work, the amount of such advance shall be recovered/ deducted from the next payment made under any of the Sub-Clauses of this Contract.
Ensuring Payment and Amenities to Workers if Contractor fails to pay	15.17	In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, any applicable Labour Laws, the Procuring Entity is obliged to pay any amounts of wages to a workman employed by the Contractor in execution of the Works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Laws or under the P.W.D. Contractor's Labour Regulations, or under the Rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by the Contractor, the Procuring Entity shall recover from the Contractor the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of the Procuring Entity under sub-section (2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, Government shall be at liberty to recover such amount or any part thereof by deducting it from the Performance Security or from any sum due by the Procuring Entity to the Contractor whether under this Contract or otherwise. The Procuring Entity shall not be bound to contest any claim made against it under sub- section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the Contractor and upon his giving to the Procuring Entity full security for all costs for which the Procuring Entity might become liable in contesting such claim.
Withholding and lien in respect of	15.18	i. Whenever any claim or claims for payment of a sum of money arises out of or under the Contract or against the Contractor,

<p>sums due from Contractor</p>		<p>the Engineer-in-Charge or the Government shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the Performance Security, if any, deposited by the Contractor and for the purpose aforesaid, the Engineer-in-Charge or the Government shall be entitled to withhold the Performance Security furnished, if any and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the Contractor, the Engineer-in-Charge or the Government shall be entitled to withhold and have a lien to retain to the extent of payable or which may at any time thereafter become payable to the Contractor under the same Contract or any other Contract with the Engineer-in-Charge or the Government or any Contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim. It is an agreed term of the Contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or Government will be kept withheld or retained as such by the Engineer-in-Charge or Government till the claim arising out of or under the Contract is determined by the arbitrator (if the Contract is governed by the arbitration Sub-Clause) or by the competent court, as the case may be and that the Contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the Contractor. For the purpose of this Sub-Clause, where the Contractor is a partnership firm or a limited company, the Engineer-in-Charge or the Government shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/ limited company as the case may be, whether in his individual capacity or otherwise.</p> <p>ii. The Procuring Entity shall have the right to cause an audit and technical examination of the Works and the final bills of the Contractor including all supporting vouchers, abstract etc., to be made within two years after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the Contractor under the Contract or any work claimed to have been done by him under the Contract and found not to have been executed, the Contractor shall be liable to refund the amount of over-payment and it shall be lawful for the Procuring Entity to recover the same from him in the manner prescribed or in any other manner legally permissible; and if is found that the Contractor was paid less than what was due to him under the Contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by the Procuring Entity to the Contractor, without any interest thereon whatsoever.</p>
<p>Lien in respect of</p>	<p>15.19</p>	<p>Any sum of money due and payable to the Contractor (including</p>

claims in other Contracts		<p>the Performance Security returnable to him) under the Contract may be withheld or retained by way of lien by the Engineer-in-Charge or the Government or any other Contracting person or persons through Engineer-in-charge against any claim of the Engineer-in-Charge or the Government or such person or persons in respect of payment of a sum of money arising out of or under any other Contract made by the Contractor with the Engineer-in-Charge or the Government or with such person or persons.</p> <p>It is an agreed term of the Contract that the sum of money so withheld or retained under this Sub-Clause by the Engineer-in-Charge or the Government will be kept withheld or retained as such by the Engineer-in-Charge or the Government till his claim arising out of the same Contract or any other Contract is either mutually settled or determined by the arbitration Sub-Clause or by the competent court, as the case may be and that the Contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this Sub-Clause and duly notified as such to the Contractor.</p>
Levy or Taxes payable by Contractor	15.20	<p>i. VAT/ Sales Tax , service tax or any other taxes and duties on Materials, works or services in respect of this Contract shall be payable by the Contractor according to Law in effect.</p> <p>ii. The Contractor shall deposit royalty and obtain necessary permit for supply of the red earth, moorum, sand, chips, bajri, stone, kankar, etc. from local authorities. The liability, if any, on account of quarry fees, royalties, octroi and other taxes and duties in respect of materials actually consumed on the Works, shall be borne by the Contractor.</p> <p>iii. If pursuant to or under any Law, notification or order any royalty, cess or the hike becomes payable to the Government of India and does not at any time become payable by the Contractor to the State Government/ Local authorities in respect of any Material used by the Contractor in the Works then in such a case, it shall be Lawful to the Government of India and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from the dues of the Contractor.</p> <p>iv. In respect of goods and Materials procured by the Contractor, for use in Works under the Contract, VAT will be paid by the Contractor himself but in respect of such goods manufactured and supplied by the Contractor and Works executed under the contract, the responsibility of payment of VAT shall be that of the Procuring Entity.</p>
Adjustments for changes in Legislation	15.21	<p>i. All the bid rates shall be inclusive of all taxes and levies payable under respective statutes, However if any further tax or levy is imposed by Statute, after the Base Date and the Contractor thereupon necessarily and properly pays such</p>

		<p>taxes/ levies the Contractor shall be reimbursed the amount so paid, provided such payments, if it any, is not, in the opinion of the Procuring Entity (whose decision shall be final and binding on the Contractor) attributable to delay in execution of work within the control of the Contractor.</p> <p>ii. The Contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the Procuring Entity and/ or the Engineer-in-Charge and further shall furnish such other information/ document as the Engineer-in-Charge may require from time to time.</p> <p>iii. The Contractor shall, within a period of 30 Days of the imposition of any such further tax or levy, give a written notice thereof to the Engineer-in-Charge that the same is given pursuant to this condition, together with all necessary information relating thereto.</p> <p>This Sub-Clause shall not be applicable if the effect of changes in legislation has been included in price variation formulae in Clause 10 [Price Variation].</p>
Pre Check and Post Check of Bills	15.22	<p>The Government/ Procuring Entity shall have a right to provide a system of pre check of Contractor's bills by a specified organization and payment by an Accounts Organisation as the Government/ Procuring Entity may in its absolute discretion decide. Any overpayments detected as a result of such pre check or post check of Contractor's bills can be recovered from the Contractor's bills and the Contractor will refund such excess payments.</p>
16. Termination of Contract by Procuring Entity		
Termination by Procuring Entity	16.1	<p>Subject to the other provisions contained in this Sub-Clause the Engineer-in-charge may, without prejudice to his any other rights or remedy against the Contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this Contract or otherwise and whether the date of completion has or has not elapsed by a notice of reasonable period in writing absolutely determine the Contract in any of the following cases:</p> <p>i. If the Contractor, having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workmanlike manner, or by workers who do not understand the instructions of the Engineer-in-Charge, or do not execute the work as per specifications or in contravention of the advice of the third party quality inspections agency about the quality of works, if any, shall omit to comply with the requirement of such notice for a period of fifteen Days thereof.</p>

		<p>ii. If the Contractor being a company shall pass a resolution or the Court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the Court or the creditor to appoint a receiver or a manager or which entitle the Court to make a winding up order.</p> <p>iii. If the Contractor has, without reasonable cause, suspended the progress of the Works for a continuous period of 30 days, or has failed to proceed with the Works with due diligence so that, in the reasoned opinion of the Engineer-in-Charge (which shall be final and binding), he will be unable to secure completion of the Works by the stipulated date of completion and continues to do so after a notice in writing of fifteen Days from the Engineer-in-Charge.</p> <p>iv. If the Contractor fails to complete the Works within the stipulated time or spans of the Works with individual date of completion, if any stipulated, on or before such date(s) of completion and or fails to achieve two continuous mile stones, does not complete them within the period specified in a notice given in writing on that behalf by the Engineer-in-Charge.</p> <p>v. If the Contractor persistently neglects to carry out his obligations under the Contract and/ or commits default in complying with any of the terms and conditions of the Contract and does not remedy it or take effective steps to remedy it within fifteen Days after a notice in writing is given to him on that behalf by the Engineer-in-charge.</p> <p>vi. If the Contractor sublets the Works or a part of Works without specific permission of the Procuring Entity/ Engineer-in-charge.</p> <p>vii. If the Contractor has not been commenced the Works by the Commencement Date or within 1/8th of the stipulated time for completion subject to a maximum of 45 Days, whichever is earlier.</p> <p>When the Contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Procuring Entity shall have the powers:</p> <p>(a) To determine or rescind the Contract as aforesaid (of which a 28 days termination or rescission notice in writing to the Contractor under the hand of Engineer-in-Charge shall be conclusive evidence). Upon such determination or rescission the Bid Security and Performance Security under the Contract shall be liable to be forfeited and shall be absolutely at the disposal of the Procuring Entity.</p> <p>(b) To employ labour paid by the Procuring Entity and to supply materials to carry out the Works or any part of the Works,</p>
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		<p>debiting the Contractor with the cost of the labour and the price of the materials (of the amount of which cost and price certified by the Engineer-in-charge shall be final and conclusive against the Contractor) and crediting him with the value of the work done in all respects in the same manner and at the same rates, as if it has been carried out by the Contractor under the terms of this Contract. The certificate of the Engineer-in-Charge, as to the value of the work done, shall be final and conclusive evidence against the Contractor provided always that action under the sub Sub-Clause shall only be taken after giving notice in writing to the Contractor. Provided also that if the expenses incurred by the Procuring Entity are less than the amount payable to the Contractor at his agreement rates, the difference shall not be paid to the Contractor.</p> <p>(c) After giving notice specifying the date and time to the Contractor to measure up the acceptable (executed as per design, drawings and specifications) work of the Contractor at Site and to take such part thereof, as shall be unacceptable out of his hands and to give it to another contractor to complete, in which case any expenses which may be incurred in excess of the sum which would have been paid to the original Contractor, if the whole work had been executed by him (of the amount of which excess, the certificate in writing of the Engineer-in-charge shall be final and conclusive) shall be borne and paid by the original Contractor and may be deducted from any money due to him by the Procuring Entity under this Contract or any other account, whatsoever, or from his Bid Security, Performance Security or the Enlistment Security or the proceeds of sale thereof, or a sufficient part thereof as the case may be.</p> <p>In the event of any one or more of the above courses being adopted by the Engineer-in-charge the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the Works or the performance of the Contract.</p> <p>In case action is taken under any of the aforesaid provisions, the Contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this Contract unless and until the Engineer-in-charge has certified in writing the performance of such work and value payable in respect thereof and he shall only be entitled to be paid the value so certified.</p>
Contractor liable to pay compensation even if action not taken under Sub-	16.2	<p>(i) In any case in which the powers conferred upon the Engineer-in-Charge by Sub-Clause 16.1 [Termination by Procuring Entity] shall have become exercisable and the same are not exercised, the non-exercise of such powers shall not constitute a waiver of any of the conditions hereof and such</p>

Clause above	16.1	<p>powers shall, notwithstanding, be exercisable in the event of any future case of default by the Contractor and the liability of the Contractor for compensation shall remain unaffected.</p> <p>(ii) In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding Sub-Clause 16.1, he may, if he so desires, after giving a notice in writing to the Contractor, take possession of all or any tools, plants, materials and stores, in or upon the Works or the Site, thereof or belonging to the Contractor or procured by him and intended to be used for execution of the Works or any part thereof, paying or allowing for the same in account, at the Contract rates or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge (whose certificate, thereof, shall be final and conclusive), otherwise the Engineer-in-Charge may, by notice in writing to the Contractor or his authorized agent, require him to remove such tools, plants, materials or stores from the premises (within a time to be specified in such notice), and in the event of the Contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the Contractor's expense or sell them by auction or private sale on account of the Contractor and his risk in all respects, and the certificate of the Engineer-in-Charge as to the expenses of any such removal, and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the Contractor.</p>
Valuation at the date of termination:	16.3	As soon as practicable after a notice of termination under Sub-Clause 16.1 has taken effect, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.
Payment after Termination	16.4	<p>After a notice of termination under Sub-Clause 16.1 has taken effect, the Procuring Entity may:</p> <ul style="list-style-type: none"> i. proceed in accordance with Sub-Clause 3.5 [Procuring Entity's Claims], ii. withhold further payments to the Contractor until the Costs of execution, completion and remedying of any Defects, damages for delay in completion (if any), and all other Costs incurred by the Procuring Entity, have been established, and iii. recover from the Contractor any losses and damages incurred by the Procuring Entity and any extra Costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 16.3. After recovering any such losses, damages and extra Costs, the Procuring Entity shall pay balance to the Contractor, if any.

Procuring Entity's Entitlement to Termination for Convenience	16.5	<p>If, at any time after the commencement of the Works, the Government/ Procuring Entity shall, for any reason, whatsoever, not require the whole work, thereof, as specified in the Contract, to be carried out, the Engineer-in-charge shall give notice, in writing, of the fact to the Contractor, who shall have no claim to any payment or compensation, whatsoever, on account of any profit or advantage which he might have derived from the execution of the Works in full but which he did not derive in consequence of the full amount of the Works not having been carried out. Neither shall he have any claim for compensation by reason of alterations having been made in the original specifications, drawings and design and instructions, which shall involve any curtailment of the Works, as originally contemplated. Provided, that the contractor shall be paid the charges for the cartage only, of materials actually brought to the Site of the Works by him for bonafide use and rendered surplus as a result of the abandonment or curtailment of the Works or any portion thereof, and taken them back by the Contractor provided, however, that the Engineer-in-charge shall have, in all such cases, the option of taking over all or any such materials at their purchase price or at local market rates whichever may be less.</p>
Corrupt, Fraudulent, Collusive or Coercive Practices	16.6	<p>If the Procuring Entity determines that the Contractor, his Sub-Contractors or any of their personnel has breached the Code of Integrity prescribed in the Act, the Rules, or the Instructions to Bidders [Section I of the Bidding Document] or has engaged in corrupt, fraudulent, collusive or coercive practices, in competing for or in executing the Contract, then the Procuring Entity may, after giving 14 Days notice to the Contractor:</p> <ul style="list-style-type: none"> i. terminate the Contract and expel him from the Site, ii. forfeit or encash performance security and any other security or bond relating to this Contract, iii. recover the payments made under the Contract alongwith interest thereon at bank rate, iv. recover compensation for loss incurred due to termination of the Contract including excess expenditure, if any incurred in getting the remaining work executed from other agency under Sub-Clause 16.1. <p>For the purposes of this Sub-Clause:</p> <ul style="list-style-type: none"> i. "corrupt practice" means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in the Contract execution; ii. "fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or the execution of the Contract; iii. "collusive practice" means a scheme of arrangement between two or more bidders, with or without the knowledge of the Procuring Entity, designed to establish bid prices at artificial, non-competitive levels; iv. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence

		<p>their participation in the procurement process or affect the execution of a Contract.</p> <p>Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent or coercive practice during the execution of the Works then that employee shall be removed in accordance with Sub-Clause 6.11 [Contractor's Personnel].</p>
Termination of Contract on death of Contractor	16.7	Without prejudice to any of the rights or remedies under this Contract, if the Contractor dies, the Procuring Entity shall have the option of terminating the Contract without compensation to the Contractor after the affidavit of his/ their legal heir/heirs that they are not in a position to complete the work as Contracted or are not going to be in this profession in future.
17. Suspension of Works and Termination by the Contractor		
Contractor's Entitlement to Suspend Work	17.1	<p>If the Engineer-in-charge fails to certify an Interim Payment Certificate in accordance with Sub-Clause 15.5 [Issue of Interim Payment Certificates] or fails to make a payment of an Interim Payment Certificate within time period specified in accordance with Sub-Clause 15.6 [Payment of an Interim Payment Certificate], the Contractor may, after giving not less than 21 Days' notice to the Procuring Entity, suspend work (or reduce the rate of progress of work) unless and until the Contractor has received the Payment Certificate or payment, as the case may be as described in the notice.</p> <p>If the Contractor subsequently receives such Payment Certificate or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.</p> <p>If the Contractor suffers delay and/ or incurs Cost as a result of suspending the Works (or reducing the rate of progress of the Works) in accordance with this Sub-Clause, the Contractor shall give notice to the Engineer-in-charge and shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to:</p> <ul style="list-style-type: none"> i. an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time for Completion], and ii. payment of any such Cost, which shall be included in the Contract Price. <p>After receiving this notice, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.</p>
Termination by Contractor	17.2	<p>The Contractor shall be entitled to terminate the Contract if:</p> <ul style="list-style-type: none"> i. the Contractor does not receive the amount due under an Interim Payment Certificate within 28 Days after the expiry of the time stated in Sub-Clause 15.6 [Payment of an Interim Payment Certificate] within which payment is to be made

		<p>(except for deductions in accordance with Sub-Clause 2.5 [Procuring Entity's Claims], or</p> <p>ii. the Procuring Entity substantially fails to perform his obligations under the Contract in such manner as to materially and adversely affect the economic balance of the Contract and/ or the ability of the Contractor to perform the Contract, or</p> <p>iii. a prolonged suspension affects the whole of the Works as described in Sub-Clause 8.13 [Prolonged Suspension], or</p> <p>iv. the Contractor does not receive the Engineer-in-charge's instruction recording the agreement of both Parties on the fulfillment of the conditions for the Commencement of Works under Sub-Clause 8.3 [Commencement of Works].</p> <p>In any of these events or circumstances, the Contractor may, upon giving 28 Days' reasoned notice to the Procuring Entity, terminate the Contract.</p>
Cessation of Work and Removal of Contractor's Equipment	17.3	<p>After a notice of termination under Sub-Clause 16 [Termination of Contract by Procuring Entity], Sub-Clause 17.2 [Termination by Contractor] or Sub-Clause 19.6. [Optional Termination, Payment and Release] has taken effect, the Contractor shall promptly:</p> <p>i. cease all further work, except for such work as may have been instructed by the Engineer-in-charge for the protection of life or property or for the safety of the Works,</p> <p>ii. hand over Contractor's Documents, as built drawings, Plant, Materials and other work, for which the Contractor has received payment, and</p> <p>iii. remove all other Goods from the Site, except as necessary for safety, and leave the Site.</p>
Payment on Termination	17.4	<p>After a notice of termination under Sub-Clause 17.2 [Termination by Contractor] has taken effect, the Procuring Entity shall promptly pay the Contractor in accordance with Sub-Clause 19.6. [Optional Termination, Payment and Release].</p>
18. Risk and responsibilities		
Indemnities	18.1	<p>The Contractor shall indemnify and hold harmless the Procuring Entity, the Procuring Entity's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:</p> <p>i. bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any Defects,</p>

		<p>unless attributable to any negligence, willful act or breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, or any of their respective agents, and</p> <p>ii. damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any Defects, unless and to the extent that any such damage or loss is attributable to any negligence, willful act or breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.</p>
Contractor's Care of the Works	18.2.1	<p>The Contractor shall take full responsibility for the care of the Works and materials and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Clause 12 [Taking Over of the Works and Sections by Procuring Entity] for the Works, when responsibility for the care of the Works shall pass to the Procuring Entity. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Procuring Entity.</p> <p>After responsibility has accordingly passed to the Procuring Entity, the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.</p> <p>If any loss or damage happens to the Works, Materials or Goods or Contractor's Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub-Clause 18.3 [Procuring Entity's Risks], the Contractor shall rectify/ reimburse the loss or damage at the Contractor's risk and Cost, so that the Works, Materials or Goods or Contractor's Documents conform with the Contract.</p> <p>The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.</p>
	18.2.2	<p>All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks are the responsibility of the Contractor.</p>
Procuring Entity's Risks.	18.3	<p>The risks referred to in Sub-Clause 18.4 [Consequences of Procuring Entity's Risks] below, insofar as they directly affect the execution of the Works, are:</p> <p>i. war, hostilities (whether war be declared or not), invasion, act of foreign enemies,</p> <p>ii. rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or</p>

		<p>usurped power, or civil war, within the Country,</p> <p>iii. riot, commotion or disorder within the Country by persons other than the Contractor's Personnel,</p> <p>iv. munitions of war, explosive Materials, ionizing radiation or contamination by radio-activity, within the Country, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity,</p> <p>v. pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,</p> <p>vi. use or occupation by the Procuring Entity of any part of the Permanent Works, except as may be specified in the Contract,</p> <p>vii. design of any part of the Works by the Procuring Entity's Personnel or by others for whom the Procuring Entity is responsible, and</p> <p>viii. Any operation of the forces of nature which is Unforeseeable or against which an experienced Contractor could not reasonably have been expected to have taken adequate preventive precautions.</p>
Consequences of Procuring Entity's Risks	18.4	<p>If and to the extent that any of the risks listed in Sub-Clause 18.3 above results in loss or damage to the Works, materials or Goods or Contractor's Documents, the Contractor shall promptly give notice to the Engineer-in-charge and shall rectify this loss or damage to the extent required by the Engineer-in-charge.</p> <p>If the Contractor suffers delay and/ or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Engineer-in-charge and shall be entitled subject to Clause 21.2 [Contractor's Claims] to:</p> <p>i. An extension of time for any such delay, if completion is or will be delayed, under Clause 8.6 [Extension of Time for Completion], and</p> <p>ii. payment of any such Cost, which shall be included in the Contract Price.</p> <p>After receiving this further notice, the Engineer-in-charge shall proceed in accordance with Clause 3.5 [Determinations] to agree or determine these matters.</p>
Intellectual and Industrial Property Rights	18.5	<p>In this Sub-Clause, "infringement" means an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and "claim" means a claim (or proceedings pursuing a claim) alleging an infringement.</p> <p>Whenever a Party does not give notice to the other Party of any claim within 28 Days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.</p> <p>The Contractor shall fully indemnify and keep indemnified the</p>

		<p>Procuring Entity and the State Government against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the Contract. The Contractor shall indemnify and hold the Procuring Entity harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.</p> <p>The Procuring Entity shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:</p> <ul style="list-style-type: none"> i. an unavoidable result of the Contractor's compliance with the Contract, or ii. a result of any Works being used by the Procuring Entity: <ul style="list-style-type: none"> (a) for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or (b) in conjunction with anything not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract <p>If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its Cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and Cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.</p>
Limitation of Liability	18.6	<p>Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any Contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.9 [Compensation/Damages for Delay]; Sub-Clause 13.3 [Cost of Remedying Defects]; Sub-Clause 16.4 [Payment after Termination]; Sub-Clause 17.4 [Payment on Termination]; Sub-Clause 18.1 [Indemnities]; Sub-Clause 18.2 [Contractor's Care of the Works], Sub-Clause 18.4 [Consequences of Procuring Entity's Risks] and Sub-Clause 18.5. [Intellectual and Industrial Property Rights].</p> <p>The total liability of the Contractor to the Procuring Entity, under or in connection with the Contract shall not exceed twice the Accepted Contract Amount. This amount does not include charges, if any, for consumption of Electricity, Water and Gas provided by the Procuring Entity under Sub-Clause 4.18 [Electricity, Water and Gas], and use of Procuring Entity's</p>

		<p>Equipment and Materials under Sub-Clause 4.19 [Procuring Entity's Equipment and Issue of Materials].</p> <p>This Sub-Clause shall not limit liability of the Contractor in any case of fraud, deliberate default or reckless misconduct by the Contractor or Sub-Contractors or their personnel or offences under any other Law for the time being in force.</p>
Use of Procuring Entity's Accommodation/ Facilities	18.7	<p>The Contractor shall take full responsibility for the care of the accommodation and facilities, if any, provided by the Procuring Entity as detailed in the Specifications, from the respective dates of hand-over to the Contractor until cessation of occupation (where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).</p> <p>If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Procuring Entity is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer-in-Charge.</p>
19. Force Majeure		
Definition of Force Majeure	19.1	<p>In this Sub-Clause, "Force Majeure" means an exceptional event or circumstance:</p> <ul style="list-style-type: none"> i. which is beyond a Party's control, ii. which such Party could not reasonably have provided against before entering into the Contract, iii. which, having arisen, such Party could not reasonably have avoided or overcome, and iv. which is not substantially attributable to the other Party. <p>Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (i) to (iv) above are satisfied:</p> <ul style="list-style-type: none"> (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies, (b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war, (c) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel, (d) munitions of war, explosive Materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity, and (e) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.
Notice of Force Majeure	19.2	<p>If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 Days after the Party became aware, or</p>

		<p>should have become aware, of the relevant event or circumstance constituting Force Majeure.</p> <p>The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.</p> <p>Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.</p>
Duty to Minimize Delay	19.3	<p>Each Party shall at all times use all reasonable endeavors to minimize any delay in the performance of the Contract as a result of Force Majeure.</p> <p>A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.</p>
Consequences of Force Majeure	19.4	<p>If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], and suffers delay and/ or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 21.2 [Contractor's Claims] to:</p> <ul style="list-style-type: none"> i. an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.6 [Extension of Time for Completion], and ii. if the event or circumstance is of the kind described in Sub-Clause 19.1 [Definition of Force Majeure] and, in the case of sub-paragraphs (a) to (e), occurs in the Country, payment of any such Cost incurred rectifying or replacing the Works and/ or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 20.2 [Insurance for Works and Contractor's Equipment]. <p>After receiving this notice, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.</p>
Force Majeure Affecting Subcontractor	19.5	<p>If any Subcontractor is entitled under any Contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Sub-Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Sub-Clause.</p>

Optional Termination, Payment and Release	19.6	<p>If the execution of substantially all the Works in progress is prevented for a continuous period of 84 Days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than 140 Days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 Days after the notice is given, and the Contractor shall proceed in accordance with Sub-Clause 17.3 [Cessation of Works and Removal of Contractor's Equipment].</p> <p>Upon such termination, the Engineer-in-charge shall determine the value of the work done and issue a Payment Certificate which shall include:</p> <ul style="list-style-type: none"> i. the amounts payable for any acceptable work carried out for which a price is stated in the Contract; ii. the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Procuring Entity when paid for by the Procuring Entity, and the Contractor shall place the same at the Procuring Entity's disposal; iii. other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works; iv. the Cost of removal of Temporary Works and Contractor's Equipment from the Site.
Release from Performance	19.7	<p>Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfill its or their Contractual obligations or which, under the Law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance:</p> <ul style="list-style-type: none"> i. The Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and ii. the sum payable by the Procuring Entity to the Contractor shall be the same as would have been payable under Sub-Clause 19.6 [Optional Termination, Payment and Release] if the Contract had been terminated under Sub-Clause 19.6.
20. Insurance		
General Requirements	20.1	In this Sub-Clause, "insuring Party" means, for each type of insurance, the Party responsible for effecting and maintaining

<p>for Insurance</p>	<p>the insurance specified in the relevant Sub-Clause.</p> <p>Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms approved by the Procuring Entity. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Sub-Clause.</p> <p>Wherever the Procuring Entity is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Contractor. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Sub-Clause.</p> <p>If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Sub-Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Procuring Entity shall act for Procuring Entity's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.</p> <p>Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.</p> <p>The relevant insuring Party shall, within the respective periods stated in the Contract Data (calculated from the Commencement Date), submit to the other Party:</p> <ul style="list-style-type: none"> i. evidence that the insurances described in this Sub-Clause have been effected, and ii. copies of the policies for the insurances described in Sub-Clause 20.2 [Insurance for Works and Contractor's Equipment] and Sub-Clause 20.3 [Insurance against Injury to Persons and Damage to Property]. <p>When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer-in-charge.</p> <p>Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Sub-Clause.</p>
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		<p>Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party. If an insurer makes (or attempts to make) any alteration, the Party first notified by the insurer shall promptly give notice to the other Party.</p> <p>If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.</p> <p>Nothing in this Sub-Clause limits the obligations, liabilities or responsibilities of the Contractor or the Procuring Entity, under the other terms of the Contract or otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/ or the Procuring Entity in accordance with these obligations, liabilities or responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.</p> <p>Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [Procuring Entity's Claims] or Sub-Clause 21.2 [Contractor's Claims], as applicable.</p>
Insurance for Works and Contractor's Equipment	20.2	<p>The insuring Party shall insure the Works, Plant, Materials and Contractor's Documents for not less than the full reinstatement Cost including the Costs of demolition, removal of debris and professional fees and profit. This insurance shall be effective from the date by which the evidence is to be submitted under Sub-Clause 20.1 [General Requirements for Insurances], until the date of issue of the Taking-Over Certificate for the Works.</p> <p>The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations including those under Clause 13 [Defect Liability].</p> <p>The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.</p>

		<p>Unless otherwise stated in the Special Conditions, insurances under this Sub-Clause:</p> <ul style="list-style-type: none"> i. shall be effected and maintained by the Contractor as insuring Party, ii. shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually bearing the Costs of rectifying the loss or damage, iii. shall be extended to cover liability for all loss and damage from any cause not listed in Sub-Clause 18.3 [Procuring Entity's Risks], iv. shall also cover, to the extent specifically required in the Contract Data, loss or damage to a part of the Works which is attributable to the use or occupation by the Procuring Entity of another part of the Works, and loss or damage from the risks listed in Sub-Clause 18.3 [Procuring Entity's Risks], excluding (in each case) risks which are not insurable at commercially reasonable terms, and v. may however exclude loss of, damage to, and reinstatement of: <ul style="list-style-type: none"> (a) a part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (b) below), (b) a part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, material or workmanship, and (c) A part of the Works which has been taken over by the Procuring Entity, except to the extent that the Contractor is liable for the loss or damage.
Insurance against Injury to Persons and Damage to Property	20.3	<p>The insuring Party shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 20.2 [Insurance for Works and Contractor's Equipment]) or to any person (except persons insured under Sub-Clause 20.4 [Insurance for Contractor's Personnel]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.</p> <p>This insurance shall be for a limit per occurrence of not less than the amount stated in the Contract Data with no limit on the number of occurrences.</p> <p>Unless otherwise stated in the Special Conditions, the insurances specified in this Sub-Clause:</p> <ul style="list-style-type: none"> i. shall be effected and maintained by the Contractor as insuring

		<p>Party,</p> <p>ii. shall be in the joint names of the Parties,</p> <p>iii. shall be extended to cover liability for all loss and damage to the Procuring Entity's property (except things insured under Sub-Clause 20.2 [Insurance for Works and Contractor's Equipment] arising out of the Contractor's performance of the Contract, and</p> <p>iv. may however exclude liability to the extent that it arises from:</p> <p>(a) the Procuring Entity's right to have the Permanent Works executed on, over, under, in or through any land, and to occupy this land for the Permanent Works,</p> <p>(b) damage which is an unavoidable result of the Contractor's obligations to execute the Works and remedy any Defects, and</p> <p>(c) a cause listed in Sub-Clause 18.3 [Procuring Entity's Risks], except to the extent that cover is available at commercially reasonable terms.</p>
Insurance for Contractor's Personnel	20.4	<p>The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.</p> <p>The insurance shall cover the Procuring Entity and the Engineer-in-charge against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Procuring Entity or of the Procuring Entity's Personnel.</p> <p>The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Sub-Clause.</p>
21. Claims, disputes and Arbitration		
Recovery	21.1.1	Any amount inadvertently paid as not due to the Contractor shall be treated as acknowledged recovery/ or debt due from the Contractor. The Contractor shall immediately inform the Engineer-in-charge about such amount and offer to reimburse immediately to the Engineer-in-charge.
	21.1.2	Whenever any claim against the Contractor for the payment of a sum of money arises out of or under the Contract, the Procuring Entity shall be entitled to recover such a sum by appropriating, in part or whole of the Performance Security, or enlistment

		<p>deposit of the Contractor. In the event of the Performance Security and enlistment deposit being insufficient or if no Performance Security has been taken, then the balance or the total sum recoverable, as the case may be, shall be deducted from any sum, then due or which at any time, thereafter, may become due to the Contractor, under this Contract or other Contracts with the Procuring Entity. Should these sums not be sufficient to cover the full amount recoverable, the balance remaining due shall be recovered from the Contractor as arrears of land revenue under Section 53 of the Act.</p>
Contractor's Claims	21.2	<p>If the Contractor considers himself to be entitled to any extension of the Time for Completion and/ or any additional payment, under any Sub-Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer-in-charge, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, but not later than 28 Days after the Contractor became aware, or should have become aware, of the event or circumstance.</p> <p>If the Contractor fails to give notice of a claim within such period of 28 Days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Procuring Entity shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.</p> <p>The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.</p> <p>The Contractor shall keep such contemporary records as may be necessary to substantiate any claim included in the claim, either on the Site or at another location acceptable to the Engineer-in-charge. Without admitting the Procuring Entity's liability, the Engineer-in-charge may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/ or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer-in-charge to inspect all these records, and shall (if instructed) submit copies to the Engineer-in-charge.</p> <p>Within 42 Days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer-in-charge, the Contractor shall send to the Engineer-in-charge a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:</p> <ul style="list-style-type: none"> i. this fully detailed claim shall be considered as interim; ii. the Contractor shall send further interim claims at monthly

		<p>intervals, giving the accumulated delay and/ or amount claimed, and such further particulars as the Engineer-in-charge may reasonably require; and</p> <p>iii. the Contractor shall send a final claim within 28 Days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer-in-charge.</p> <p>Within 42 Days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer-in-charge and approved by the Contractor, the Engineer-in-charge shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within the above defined time period.</p> <p>Within the above defined period of 42 Days, the Engineer-in-charge shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.6 [Extension of Time for Completion], and/ or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.</p> <p>Each Payment Certificate shall include such additional payment for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.</p> <p>If the Engineer-in-charge does not respond within the timeframe defined in this Sub-Clause, the matter may be brought to the attention of the Procuring Entity by the Contractor within 15 days (beyond the initial period of 42 days) for timely intervention. If the Contractor is not satisfied with the decision of the Engineer-in-charge/ Procuring Entity, the Parties may refer the dispute to the Dispute Resolution Board in accordance with Sub-Clause 21.3 [Dispute Resolution].</p> <p>The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/ or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.</p>
Dispute Resolution	21.3.1	The procedure of reference of disputes to the Dispute Resolution Board and its functioning shall be as per Appendix B.
	21.3.2	The disputes which remain unresolved by the Dispute Resolution

		Board may be referred by either Party to Arbitration.
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APPENDIX A

General Conditions for admissibility of Escalation

1. The exact percentage of labour/ material (excluding materials to be supplied by the Procuring Entity)/ bitumen/ diesel and petrol/ cement/ steel component for the Works shall be approved by the authority while sanctioning the detailed Estimates.

2. The breakup of components of labour/ materials (excluding materials to be supplied by the Procuring Entity)/ bitumen/ diesel and petrol/ cement/ steel as indicated in this Clause have been pre-determined as below:-

- (a) Labour ----- 30 percent
 - (b) Material ----- 50 percent
 - (c) Bitumen ----- 01 percent
 - (d) Diesel and Petrol ----- 01 percent
 - (e) Cement ----- 12 percent
 - (f) Steel ----- 06 percent
- (Applicable only on sewer line work not for STP & SPS)**
- Total-----100%]**

3. While allowing price escalation the following shall be deducted from the value of Works done (R):

- (a) Cost of material supplied by the Procuring Entity.
- (b) Cost of services rendered for protection of the Works.
- (c) Secured Advance/ any advance added earlier but deducted now after Works is measured.
- (d) Cost of extra items, the rates for which have been worked out based on market rates/ mutually agreed rates.

4. The first statement of escalation shall be prepared at the end of three months in which the Works was awarded and the Works done from the date of start to the end of this period shall be taken into account. For subsequent statement, cost of Works done during every quarter shall be taken into account. At the completion of Works, the Works done during the last quarter or fraction, thereof, shall be taken into account.
5. For the purpose of reckoning the Works done during any period, the bills prepared during the period shall be considered. The dates of recording measurements in the Measurement Book by the Assistant Engineer shall be the guiding factor to decide the bills relevant to any period. The date of completion, as finally recorded by the competent authority in the Measurement Book, shall be the criterion.
6. The index relevant to any quarter, for which such compensation is paid, shall be the arithmetical average of the indices relevant of the calendar month.
7. Price adjustment Clause shall be applicable only for the Works that is carried out within the stipulated time, or extension thereof, as are not attributable to the Contractor.
8. If during the progress in respect of Contract Works stipulated to cost Rs.50 lacs or less, the value of Works actually done excluding cost of material supplied by the Procuring Entity, exceeds Rs. 50 lacs and completion period is more than 3 months, then escalation would be payable only in respect of value of Works in excess over Rs.50 lacs from the date of satisfying both the conditions.
9. Where originally stipulated period is 3 months or less but actual period of execution exceeds beyond 3 months on account of reasons not attributable to the Contractor, escalation amount would be payable only in respect of extended period if amount of Works is more than Rs.50 lacs.
10. In case the Contractor does not make prorata progress in the first or another time span and the short fall in progress is covered up by him during subsequent time span within original stipulated period then the price escalation of such Works expected to be done in the previous time span shall be notionally given based upon the price index of that quarter in which such Works was required to be done.
11. No claims for price adjustment other than those provided herein, shall be entertained.
12. If the period of completion including extended period attributable to the Procuring Entity exceeds three months but cost does not exceeds more than Rs.50 lacs, no escalation is admissible.
13. Similarly, if cost of Works increases more than Rs.50 lacs but completion period including extended period attributable to the Procuring Entity is less than 3 months, no escalation is admissible.
14. No provisional escalation is payable on the basis of indices of the previous quarter in absence of non publication of indices for concerned quarter by the RBI.
15. Escalation is always payable quarterly and no provisional escalation is payable monthly or fortnightly.
16. In case at the time of executing agreement, both the conditions (completion period 3 months and amount of Works Rs.50 lacs for admissibility of price escalation are not fulfilled and subsequent due to additional Works and extension of time attributable to Procuring Entity, both the conditions become fulfilled, in that case the escalation shall be payable from the date of satisfying both the conditions and only for Works done beyond Rs.50 lacs and in period of Works beyond 3 months.

17. The Contractor shall for the purpose of these conditions keep such books of account and other documents as are necessary to show the amount of any increase claimed or reduction available and shall allow inspection of the same by a duly authorised representative of the Government/ Procuring Entity and further shall at the request of the Engineer-in-charge furnish, verified in such a manner as the Engineer-in-charge may require any documents so kept and such other information as the Engineer-in-charge may require.

18. Price variation Clause shall be applicable in case of lump sum contracts estimated to cost more than Rs.100 crores with stipulated completion period of more than 18 months.

19. The component of operation and maintenance (O&M) cost included in the Contract Price shall not be subject to price variations. The price may be adjusted by the use of prescribed formula (or formulae) which breaks down the total price into components.

20. The amount of price variation in case of lump sum contracts will be made by adding or deducting, as the case may be, from the payments made at the stages of Works specified in the Contract document.

Appendix B

Dispute Resolution During Execution of the Contract

1.0 Dispute

Disputes are germane to any contract. A 'dispute' implies an assertion of a right or a claim by one party and repudiation thereof by the other party, either expressed or implied, and may be by words or by conduct. A mere 'difference' is not necessarily a dispute; when the parties fail to resolve it, the difference culminates in dispute.

1.1 Dispute Resolution in a Construction Contract

Since arbitrations are fairly time consuming, it is always advisable to sort out the disputes mutually through the mechanism of adjudication through Dispute Resolution Board (DRB), which is a sort of voluntary arbitration. Arbitration can be resorted to if the adjudication decision is not forthcoming or is not acceptable to any party. For dispute resolution following procedure will be followed:

2.0 Dispute Resolution Board (DRB)

- (a) A formal Sub-Clause of obtaining dispute resolution through DRB will be inserted in the Conditions of the Contract. A separate Dispute Resolution Agreement will also be drawn up, detailing therein provisions like: Eligibility of Members, date of commencement, manner of entry on the reference by the Members and their resignation; obligation of the Members, the Procuring Entity and the Contractor; terms of payment (monthly retainership fee, daily fee for travel & site visits, out-of-pocket expenses); manner of sharing the fees and expenses and of making payments; arrangements of site visits and their frequency; conduct of hearings; termination/phasing out the activities of DRB; default of the Member, and action to be taken in case of dispute in relation to DRB Agreement, etc.
- (b) DRB should be put in place within one month of Letter of Acceptance.
- (c) The DRB for all projects costing more than Rs 10 crore will comprise of three Members, one each to be appointed by the Procuring Entity and the Contractor and approved by the other. The third

Member, who will also act as the presiding Member, will be selected by the first two Members and approved by the parties. If either of the first two Members is not so selected and approved, or the parties fail to reach an agreement on the third Member then on request of either or both parties, appointment will be made by concerned Administrative Department in case of Government Departments and Head of the Organisation (Chairman, etc.) concerned in other cases.

- (d) The Members to be appointed shall be out of a panel maintained by the Department/ Organisation concerned and should be experienced in the type of construction actually involved and/ or finance and accounts and/ or contractual documents. **They should be persons of repute and integrity.**
- (e) If any dispute that arises at any stage between the Procuring Entity and the Contractor in connection with, or arising out of the Contract or the execution of the Works, including any disagreement by either party with any action, inaction, opinion, instruction, determination, certificate or valuation of the Engineer, the matter in dispute shall, in the first place, should be tried to be settled amicably. If the dispute still remains unsettled, it shall be referred to the DRB.
- (f) Both parties shall promptly make available all information, access to the Site, and appropriate facilities, as the DRB may require for the purposes of making a recommendation on such dispute.
- (g) Within 56 days after receiving such reference, or within such other period as may be proposed by the DRB and approved by both parties, the DRB shall give its recommendation with reasons. The recommendation shall be binding on both parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the Works in accordance with the Contract.
- (h) If either party is dissatisfied with the recommendation, then either party may, within 28 days after receiving the recommendation, or if the DRB fails to give its recommendation within 56 days (or as otherwise approved), within 28 days after the said period of 56 days has expired, give notice to the other party, with a copy to the Engineer-in-Charge, of its intention to commence arbitration proceedings.
- (i) If the DRB has given its decision within the stipulated period, and no notice of intention to commence arbitration as to such dispute has been given by either party within 28 days of the said decision, then the decision of DRB shall become final and binding.

3.0 Arbitration

- (a) Any dispute in respect of which the recommendations (if any) of DRB has not become final and binding, shall be finally settled by arbitration in accordance with the Indian' Arbitration and Conciliation Act, 1996, or any statutory amendment thereof.
- (b) The Arbitral Tribunal will comprise three Members, one each to be appointed by the Procuring Entity and the Contractor. The third Member, who will also act as the presiding Member, will be appointed by mutual consent of the first two Members. If the parties fail to reach an agreement on the third Member then on request of either or both parties, appointment will be made by concerned Administrative Department in case of Government Departments and Head of the Organisation (Chairman, etc.) concerned in other cases.

- (c) The Tribunal shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer-in-Charge, and any decision of the DRB, relevant to the dispute.
- (d) Neither party shall be limited in the proceedings before the Tribunal to the evidence or arguments previously put before the DRB to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction.
- (e) Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer-in-Charge and the DRB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

4.0 Language

All proceedings before DRB/ arbitral tribunal shall be in the Language of the Contract/ English.

5.0 Terms and conditions for engagement of DRB Member and Chairman

The terms and conditions including the remuneration and other facilities to be given to the Members of DRB and Arbitrators in case of civil engineering construction contracts/ consultancies shall be as notified by the State Government from time to time. Each Party to the Contract (the Contractor/ Consultant) shall be responsible for paying one-half of the remuneration. Since the fee structure has to be agreed by both the parties i.e. Procuring Entity and Contractor/ Consultant, the fee structure may also be got accepted by the respective Contractor/ Consultants. In the contracts the fee structure may be included as part of the bidding documents/ contract documents and the acceptance of the fee structure by the Contractors/ Consultants may be kept as a pre-condition for signing the Contract.

Section VI B: Contract Data / Special Conditions of Contract

Ref. to GC C	Subject	Data
1.1	Procuring Entity's designation and address are:	THE CHIEF EXECUTIVE OFFICER Udaipur Smart City Limited. EMAIL: mc_udaipur@rediffmail.com
	The Works or Work is:	Design, construction, supply, installation, testing and commissioning and operating for 15 years under Hybrid Annuity Model (Which will include all Civil, Mechanical, electrical, instrumentation & other necessary works) of STP's (25 MLD + 10 MLD + 5 MLD) based on SBR Process (equivalent or higher process) having provision for reuse of 50% treated water of Udaipur Town
	The Site is:	Udaipur
	Engineer-in-Charge's Designation and Address and communication details are:	Udaipur Smart City Limited
	The Time for Completion and the Intended Completion Date are:	24 months including trial run period
	Provisional sums/ Lump sums are:	Lump sum / Turnkey proposed on HAM as specified in Clause 1.1.3 of Section-II: Bidding Data.
	The Department is:	Udaipur Smart City Limited
1.3	Communication:	Electronic transmission shall include e-mail, fax etc. and delivered shall include their transmission sent successfully to correct address.
1.4	The Language of the Contract is:	English

1.8.1	Signing of the Contract Agreement:	<p>Within 30 Days of issue of notification of the award.</p> <p>Add following text in the last.</p> <p>It is mandatory to register the JV under relevant Act after award of Letter of Acceptance but before signing of Contract Agreement within 30 days of issuance of Letter of Acceptance. Failure to register the JV in stipulated period may lead to forfeiting of bid security.</p> <p>The equity sharing as declared at the time of bidding shall be maintained while registering the JV before Contract execution. The minimum equities of all partners shall be maintained throughout the currency of contract.</p> <p>The Contract Agreement shall be executed with authorized representative of JV and all partners of JV.</p>
1.14	Care and Supply of documents	<p>Add:</p> <p>The Contractor shall maintain standard Site Order Books at the Site at all times during the execution of the Works for the use of the Procuring Entity's Representative and the Contractor. All instructions issued by the Procuring Entity's Representatives to the Contractor shall be recorded in duplicate in the Site Order Book and shall be signed by the issuer and countersigned by the Contractor. After compliance with the instruction the Contractor shall record the same in the Site Order Book duly signed and countersigned by the Procuring Entity's Representative. Acceptance of any part of the Works executed by the Contractor shall be subject to verification with respect to compliance of respective instructions of the Procuring Entity's Representative through the Site Order Book. The Procuring Entity's Representative shall retain the original copy of the site orders, while the Contractor shall retain the duplicate ones.</p>
4.1.5	Requirement of designing by the Contractor:	<p>All designs, drawings, etc shall be done by the contractor at his own cost.</p> <p>Prior to commencement of the Tests on Completion, the Contractor shall prepare, and submit to the Procuring Entity's Representative, operation and maintenance manuals in accordance with the Procuring Entity's Requirements and in sufficient detail for the Procuring Entity to operate, maintain, dismantle, reassemble, adjust and repair the Works. The Works shall not be considered to be completed for the purposes of taking-over until such operation and maintenance manuals have been submitted to the Procuring Entity's Representative for the entire system.</p>
4.3	Performance Security	<p>Replace GCC Clause 4.3.1 (i to v) at page no. 232 with the following:</p> <p>Performance Security amounting to total 10% of contract value (but excluding O&M cost and provisional sum) shall be submitted / deducted as follows:</p> <p>(i) Contractor shall submit Performance Security @ 10% in advance at the time of signing of agreement in form of BG as per latest rules under RTPP act. The BG should be issued by any nationalized / schedule bank and shall remain valid up to 60 days beyond defect liability period. Bank Guarantee submitted against the performance guarantee, shall be unconditional and en-cashable/invokable at</p>

		Bundi when presented in specified Branch Office. GCC Clause 4.3.1 (vi) at page 233 DELTED.
4.3.5	Refund of Performance Security	(i) Security deposit deposited/deducted as per clause 4.3 (i) above, shall be refunded within 60 days after the satisfactory completion of the Defect Liability Period subject to submission of fresh PG (for O&M) as per clause 4.3 (ii) above.
4.4	Commencement of the Works	The Works shall be commenced within a period of 7 Days from the date of signing of the Contract.
4.9.1	Third Party Quality Inspections as per ISO 17020 by a Departmental Authority or QCI approved/ accredited bodies:	Shall be conducted.
4.14	Avoidance of Interference with public conveniences	<p>Add</p> <p>In case any operation connected with the works necessitates diversion, obstruction or closure of any road, railway, waterway or any other right of way, the approval of the Engineer-in-charge or the Engineer's Representative and the respective competent authorities shall be obtained well in advance by the Contractor. In case the Contractor's operations obstruct access to adjacent properties, the Contractor shall be responsible to provide reasonable temporary access to the affected parties. In case the Contractor fails to provide adequate temporary facilities, this shall be deemed to be an uncorrected Defect under the terms of Clause 31 and the Procuring Entity shall have the right to engage a third party to correct the Defect and the cost of such correction will be deducted from the Contract Price.</p> <p>The contractor will also be responsible to ensure completion of his work with utmost effort in earliest possible period to ensure minimum inconvenience to the public at large. If in the opinion of the Engineer in Charge, the work has not been done in time and the passage way not restored satisfactorily in time, he may after giving a notice of seven days have the work done through any other agency. He will in these circumstances enter the work done as work done by the contractor in measurement book and pay for the same to the contractor and also recover the actual cost paid by him for the work plus 5% of the value of this work from the payments or any other money due to the contractor.</p>
4.18	Cost of water & electricity	Add: Charges for power connection for trial run, commissioning and O&M

		purpose shall be borne by contractor															
4.19	Issue of Procuring Entity' equipments and materials, if any:	None															
6.3.1	Employment of Technical Staff and other Employees	<p>Add:</p> <p>The list of technical staff and personnel required during the execution period and during the O&M period is given in the Bidding Data Sheet. In case the contractor does not engage the staff as specified in this section, the EIC shall deduct amounts as indicated below and shall engage staff on his own:</p> <table border="1"> <thead> <tr> <th>S.No</th><th>Position required</th><th>Salary to be deducted if not engaged by contractor</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Project Manager</td><td>Rs. 75,000/- per month</td></tr> <tr> <td>2.</td><td>Subject Matter Specialist</td><td>Rs. 60,000/- per month</td></tr> <tr> <td>3.</td><td>Quantity Surveyor cum Safety Engineer</td><td>Rs. 50,000/- per month</td></tr> <tr> <td>4.</td><td>Site Engineer cum Quantity Surveyor</td><td>Rs. 50,000/- per month</td></tr> </tbody> </table>	S.No	Position required	Salary to be deducted if not engaged by contractor	1.	Project Manager	Rs. 75,000/- per month	2.	Subject Matter Specialist	Rs. 60,000/- per month	3.	Quantity Surveyor cum Safety Engineer	Rs. 50,000/- per month	4.	Site Engineer cum Quantity Surveyor	Rs. 50,000/- per month
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3.	Quantity Surveyor cum Safety Engineer	Rs. 50,000/- per month															
4.	Site Engineer cum Quantity Surveyor	Rs. 50,000/- per month															
6.7	The normal working hours at the Site and Days of rest shall be:	<p>9 AM to 5 PM as per relevant Labour Laws.</p> <p>However, when work is stopped, it should be ensured by the contractor that all safety measures have been taken to avoid any untoward incident during non-working hours.</p>															
7.3	Inspection	<p>Add:</p> <p>The Contractor shall place order for the material and the equipment only after approval of the Engineer-in-charge. The Contractor shall submit the detailed drawings to the Engineer-in-charge for approval.</p> <p>The Contractor shall inform the Engineer-in-charge about the likely dates of manufacturing, testing and dispatching of the material. The Contractor shall notify the Engineer-in-charge for inspection and testing, at least twenty eight (28) days prior to packing and shipping and shall supply the manufacturer's test results and quality control certificates.</p> <p>The inspection and test categories shall be applied prior to delivery of the equipment, of various categories as indicated in the technical specifications for each type of equipment.</p> <p>Category A: The drawing has to be approved by the Procuring Entity's Representative before manufacture and testing. The material has to be inspected by the Engineer-in-charge or an inspecting agency after approval of Procuring Entity's Representative at the manufacturer's premise before packing and dispatching. The inspection charges of the agency will be borne by the Procuring Entity but the contractor has to</p>															

pay the inspection charges. The contractor will include in their next bill the inspection charges and the same will be reimbursed by the Procuring Entity from the provisional sum. The contractor shall provide the necessary equipment and facilities for tests and the cost thereof shall be borne by the Contractor.

Category B: The drawings of the equipment have to be submitted and to be approved by the Engineer-in-charge prior to manufacture. The material has to be tested by the manufacturer and the manufacturer's test certificates are to be submitted and approved by the Engineer-in-charge before dispatching of the equipment. Notwithstanding the above, the Engineer-in-charge, after examination of the test certificates, reserves the right to instruct the Contractor for retesting, if required, in the presence of the Contractor's representative.

Category C: The material may be manufactured as per relevant standards and deliver to the site.

For material / equipment under Category 'A' and 'B' the Engineer-in-charge will provide an\ authorization for packing and shipping after inspection.

INSPECTION CATEGORY

The testing, approval for dispatching shall not absolve the Contractor's obligations for satisfactory performance of the equipment/material.

INSTRUMENTATION WORKS

Sr. No.	Items	Category of Inspection
1	Anunciator panel, PLC & SCADA system, Instrument control panel.	A
2	Ultrasonic sensors transmitter (Flow & Level)	A
3	Pressure gauges, Pressure switches, level switches.	B
4	Level sensors transmitter (capacitance type)	A
5	Panel meters (Digital & Analog)	A
6	Instrumentation cables	A
7	Laboratory equipment	C
8	Dissolved Oxygen sensors, transmitter	B
9.	Cable tray and accessories	C

MECHANICAL WORKS

Sr. No.	Items	Category of Inspection
1.	Mechanical Coarse & Fine Screen	A
2.	Manual screen	B
3.	Conveyor belt	B

		4.	Grit separators unit	B
		5.	Blowers	A
		6.	Diffuser elements(if any)	C
		7.	Air header and drop pipes	C
		8.	Lifting mechanism for drop pipes and diffusers	C
		9.	Decanter mechanisms(if any)	A
		10.	a. Pumps more than 10 KW and Special Duty	A
			b. Pumps 5 to 10 KW	B
			c. Pumps below 5 KW	C
		11.	Sluice gates as per IS 13349	A
		12.	Open channel gates	C
		13.	All valves	C
		14.	Chain pulley block and electric hoist	C
		15.	Laboratory equipment and instruments	C
		16.	Sludge tank agitator	B
		17.	Centrifuges	A
		18.	Polyelectrolyte dosing tanks	C
		19.	Polyelectrolyte dosing tanks agitators	C
		20.	Polyelectrolyte dosing pumps	C
		21.	Pipes and fittings	C
		ELECTRICAL WORKS		
		Sr. No.	Items	Category of Inspection
		1	Transformer	A
		2	Power Capacitors and APFC Panel	B
		3	415 V Power Cum Motor Control Centre and Motor Control Center	B
		4	Sub-distribution boards and Main distribution (Lighting & power)	B
		5	Motors for blower and VFD associated	A
		6	Other motors	B
		7	Power and control cables (HT & LT)	B
		8	Drop off fuse	C

		9	Lightning arrestor	C
		10	Porcelain insulator and insulator fittings	C
		11	HT panel with VCB s	A
		12	HT metering panel	A
		13	HT termination Kits	C
		14	Earthing System and Materials	C
		15	Local push button stations	B
		16	Light fittings	C
		17	Cable tray, supporting structural	C
		18	Battery charger and Battery	
		19.	L T Cable glands and termination accessories	C
		20.	Lighting materials, 3-Pin plug sockets, poles, switches, junction boxes, ceiling fan & exhaust fans	C
		21.	Solenoid valves	B
8.5	Construction Programme	Add: The contractor should submit the programme in advance		
9.2.1	Deviations/ Variations Extent and Pricing	Competent authority is as over prevailing SOP and Rules of department/ state government for similar nature of works.		
9.2.2	(In case of Lump Sum Contract, Rates of measured up additions and alterations shall be as per applicable BSR or rates of Day Work given be the Contractor and forming part of the Contract)	The concerned Schedule of Rates of the district/ area shall be the RUIDP SOR 2013.		
10.3	General Conditions for admissibility of Price Variation	The following is stipulated in the Appendix A, point 18 of GCC; “Price variation Clause shall be applicable in case of lump sum contracts estimated to cost more than Rs.100 crores with stipulated completion period of more than 24 months”. In view of this, payment against price variation shall not be admissible for work of STP.		
15.3	Schedule of Payments on performance	Add: <u>Performance Based Payment Conditions</u>		

	based for sewer system and STP,s (in case of Lump Sum Contract payments shall be linked to various stages of completion of Works given in the Activity Schedule)	<div>Payments for STP & Associated works</div> <p>Payment shall be made in stages for each STP as per Hybrid Annuity Model.</p> <ul style="list-style-type: none">Bidder will bear 60 % of the cost and 15 year complete operating cost.After commissioning (completion of the construction of STP and successful one month trial run), USCL will release 40 % of the 40% of the total amount quoted by contractor for the turnkey job will be paid to the bidder (40% of the total amount quoted by contractor for the turnkey job will be the share of procuring authority USCL) andrest amount will be paid in 15 years in equal annuity.														
20	Insurance	<p>The details of Insurance covers to be obtained by the Contractor and the Procuring Entity, including their value, terms and extent of coverage and other terms and conditions shall be as under:</p> <p>The minimum amount of Third Party Liability insurance cover shall be Rs 20,00,000 (Rupees Twenty Lakhs only) per occurrence or event, with the number of occurrences not less than four. The Contractor shall promptly notify the Project Manager of each claim made under the Third Party Liability coverage, and shall renew the Third Party Insurance after each such occurrence in order to maintain the number of covered occurrences at not less than four.</p> <p>The minimum coverage against damage to the Works and materials during construction shall be Rs. 25, 00,000 (Rupees Twenty Five Lakhs only).</p> <p>The entire cost of insurance as stipulated in clause 20 of GCC shall be borne by the contractor. The Insurance covers shall be handed over by one Party to the other Party at the time of signing of the Contract Agreement. Insurance covers should be renewed by the contractor before its expiry.</p>														
22	Personnel	<p>List of minimum personnel required during execution period</p> <table><tr><th>S. No</th><th>Position required</th><th>Educational Qualifications</th><th>Experience on similar work years/ Nos.</th><th>Mandated by the Single bidder</th><th>Mandated by bidders in JV (Not permitted)</th><th>Total Personnel by JV partners-</th></tr><tr><td>1.</td><td>Project Manager</td><td>Graduate/ post graduate in Engineering + desirable: project management</td><td>10 years on various engineering works.</td><td>One</td><td></td><td></td></tr></table>	S. No	Position required	Educational Qualifications	Experience on similar work years/ Nos.	Mandated by the Single bidder	Mandated by bidders in JV (Not permitted)	Total Personnel by JV partners-	1.	Project Manager	Graduate/ post graduate in Engineering + desirable: project management	10 years on various engineering works.	One		
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1.	Project Manager	Graduate/ post graduate in Engineering + desirable: project management	10 years on various engineering works.	One												

		qualifications							
2.	Subject Matter Specialist	Graduate/ post graduate in Engineering	-do-5 years	One for sewerage and one for STP					
4.	Quantity Surveyor cum Safety Engineer	Diploma in Engg.+ safety at construction site course.	-do-	One for sewerage and one for STP					
5.	Site Engineer cum Quantity Surveyor	Diploma in Engg	2 years	Two for sewerage and one for each STP					
6	<i>water supply and sanitary Engineer</i>	On requirement call							

For Guidance:

Suggestive Duties:

1. Project Manager: Overall project coordination and monitoring to ensure completion in time and given cost. He will be Contractor's authorised representative at the Site. He will be a Civil/Mechanical or Electrical /Electronics Engineer.

2. Subject Matter Specialist: to be a project specialist on designs, i.e. structural engineer for buildings/bridges, Mechanical Engineer for Industrial projects and Electrical or Power transmission Engineer for Power sector projects, Civil or Mechanical Engineer for water supply and sewerage projects, Irrigation Engineer for dams and canals etc.

3. Materials/ Quality Investigation Engineer: Civil Engineer good at materials and all kinds of subsoil/geo tech investigations. Sampling, testing, compliance to Quality Assurance Plan, surveys, investigations, Compliance to specifications, drawings and designs.

4. Quantity Surveyor cum safety Engineer: Estimating, billing, variations, safety at site operations, etc.

List of minimum personnel to be engaged during O&M period FOR EACH STP

S. No.	Category of employee	Number of employees
(i)	overall in-charge/ Fitter / Electrician	1(for Town)
(ii)	Pump Driver/technician	3(each STP)
(iii)	Lab Assistant	1(Each STP)
(iv)	Labour	3 (Each STP)

23

Machinery & Equipment
(For Each Town)

(v)	Sec. Guard	3(Each STP)
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Machinery & Equipment:

(a) Suggestive list of equipment required in the field laboratory at each town

S.No.	Equipment	Min. Nos. Required.
	For Building Construction Projects	
1.	IS sieves with lid/pan: Size in mm: 100, 90, 80, 63, 53, 45, 37.5, 26.5, 19,13.2,11.2,9.5,4.75,2.8,5.6,3.35,2.36, 600 , 500, 425,355, 250, 212, 180, 150, 90, 75, 63,53,45,and 38 micron,	1 set
2.	Cube moulds 70 mm for mortar	6
3.	Cube moulds for CC 150 mm	6
4.	Compression testing machine 200t	1
5.	Electronic/digital balance 1 kg with least count of 0.01g	1
6.	Electronic / digital balance 5 kg	1
7.	Pan balance with weight box 5 kg.	1
8.	Enameled tray	6
9.	Oven (300oC) thermostatically controlled, sensitivity 1oC	1
10.	Slump cone	1
11.	First Aid Box	1
12.	Vicat Apparatus	1
13.	Room cooling equipment for temperature control	1 or 2
14.	Atterberg Limit Apparatus	1
31.	Steel tapes 50 m	2
32.	Steel tapes 5m	6
33.	All relevant BIS codes,	1 copy each for ref.
34.	Computer, printer , modem and internet	1 set.

		<table border="1"> <tr> <td>35.</td><td>Others if required:</td><td></td></tr> </table> <p>(b) Suggestive list of survey equipment required</p> <table border="1"> <thead> <tr> <th>S. No</th><th>Survey Equipment</th><th>Minimum No. required.</th></tr> </thead> <tbody> <tr> <td>1.</td><td>Total Station</td><td>1</td></tr> <tr> <td>2.</td><td>Theodolite</td><td>1</td></tr> <tr> <td>3.</td><td>Precision level</td><td>1</td></tr> <tr> <td>4.</td><td>Measuring Equipment</td><td>As required.</td></tr> <tr> <td>5.</td><td>Others as required</td><td></td></tr> </tbody> </table>	35.	Others if required:		S. No	Survey Equipment	Minimum No. required.	1.	Total Station	1	2.	Theodolite	1	3.	Precision level	1	4.	Measuring Equipment	As required.	5.	Others as required	
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5.	Others as required																						
24	Service Improvement Plan (SIP)	<p>SIP- Activity Schedule</p> <p>Schedule of various activities of the SIP has to provide in time as per direction of Engineer incharge:</p>																					
25		All items shall be ISI Marked for which ISI Mark is available.																					
26		<p>The trial run period shall be one month.</p> <p>Event of commissioning of STP: Event of commissioning of STP shall be after successful completion of one month trial run for performance guaranteed parameters.</p>																					

SECTION VI B1

SPECIAL CONDITIONS OF CONTRACT –O&M (Sewer Line)

1. DEFINITIONS

1.1 ADVERSE OPERATING PERIOD

The period, during which waste water and/or is not provided by the department at the STP.

1.2 COMMENCEMENT OF O&M PERIOD

From the date of Completion of the trial period and issue of completion certificate as per TENDER DOCUMENT conditions.

1.3 OPERATION AND MAINTENANCE CONTRACT PERIOD

Fifteen years from the commencement of O&M period as per clause 1.2 above.

1.4 DATE OF ISSUE OF TAKING OVER CERTIFICATE

After the completion of Contract Period, for contract as per clause 1.3 above, provided that the contractor has fulfilled the provision of Tender Document.

1.5 GOOD ENGINEERING PRACTICE

In respect of the Contractor, its subcontractors, and all other such third party agents of the Contractor, practices, methods, techniques and standards, as changed from time to time, that are generally accepted for use internationally for water/ sewer treatment facility, pump house along with its electrical &-mechanical equipment(s), all type of pipe line and pipe appurtenances, all type of meters and control equipment(s), power sub-stations, and all other facility during construction, development, operations and maintenance, taking into account conditions in India.

1.6 NON-CONFORMANCE EVENT

Any occasion on which the Contractor does not supply the notified average flow per day to the respective STPs.

1.7 OPERATION AND MAINTENANCE COMPLETION CERTIFICATE

As defined in Clause of Tender Document of this Project.

1.8 OPERATIONS AND MAINTENANCE SERVICES

All Services which are the responsibility of the Contractor and are required to fulfill the obligation of bid document and/or in the approved operation and maintenance manual and as defined in any other clauses of this contract.

1.9 EXPIRY OF CONTRACT PERIOD

As per Clause 1.3 above (or) as extended, as per the provisions TENDER DOCUMENT.

2. EXTENSION & EXPIRY OF CONTRACT**2.1 EXTENSION OF OPERATION AND MAINTENANCE PERIOD**

2.1.1 The Operations & Maintenance Period can be extended for another period of 7.5 years based on such terms as acceptable to both Parties ("The Contractor" and the "ULB/UIT/USCL")

2.1.2 In such an event, either Party ("The Contractor" or the "Department") shall notify its intention to extend the Operations & Maintenance Period at least six months before its expiry and commence discussions with the other Party to arrive at a mutually agreed basis of terms and conditions for the extended period.

2.2 EXPIRY OF THE OPERATION AND MAINTENANCE PERIOD & TAKING OVER BY THE DEPARTMENT

2.2.1 Six months prior to the expiry period, the Department will notify the contractor, the maintenance required for the facilities including all structures and road, plants, materials and equipment(s) therein, so that the facilities may be taken over in an acceptable physical conditions (physical conditions in reference to the initial physical condition at the start of O&M period, after accounting reasonable wear and tear during operation) and in operation conditions.

2.2.2 Notwithstanding to the notification done by department as per clause 2.2.1 above, the contractor shall repair, maintain and operate the facilities as per the terms and conditions of this contract, till 12.00 Noon up to the date of expiry of contract period.

2.2.3 The contractor, shall be liable for all defects, faults, blockages in sewer/chambers etc occurred or noticed prior to the 12.00 Noon, up to the date of expiry of contract, even if the facilities are taken over by the department subsequently, due to expiry of contract period, as per clause 2.2.2 above. However, the ULB has to notify all such defects/liabilities of contractor within 30 days of taking over of facilities.

2.2.4 Till the date of expiry of contract period, the contractor shall do all routine and periodic/break-down maintenance as prescribed in the O&M manual, in force, at the time of expiry of contract.

2.2.5 On expiry of contract, the contractor shall hand over all spares, tools and for which he has been paid.

2.2.6 After, expiry of the contract, the contractor shall provide two copies of the updated

O&M manual. The components of communication system used during O&M period in operating condition, the T&P required for maintenance of facilities.

2.2.7 If the contractor does not comply with any of the provisions from 2.2.1 through 2.2.6 above, or any other requirement in pursuance of Good Industrial Practices, the Engineer –In-charge shall estimate the cost of liabilities due to violation of any of the provisions of this contract. Such estimates made by Engineer-In-Charge shall be final and binding for the contractor. However, in a reasonable endeavor, such estimates shall be communicated to the contractor, within 30 days of expiry of the contract. The contractor shall be given an opportunity to rectify the damages through his staff/agents, or for supply of required material provided such rectification of defects on maintenance do not require any shut down of the system, within 60 days of such notification of estimates by department.

2.2.8 Within 120 days of expiry of the contract period as per clause 1.4, the Department shall prepare the final estimates for recovery from the contractor and shall prepare the final bill for the work.

2.2.9 If the recoveries to be done by Department are more than the final bill to be paid, the contractor shall deposit the required amount to be recovered from contractor or this amount shall be recovered from the securities/guarantees etc. with the department as deemed suitable.

2.2.10 After the date of expiry of contract and recoveries of all dues payable by the contractor, the Engineer-In-Charge shall issue a "Certificate of Taking over."

3. PAYMENTS

3.1 BASIC SERVICE CHARGE (BS)

The annual/yearly payment for STP shall be as specified in the BOQ and in tender document on HAM. Accordingly, yearly payments shall be made @ of the stipulated fixed amount. Payment include all expenditures and expenses required to be incurred on labour, repair and/or replacement of material, equipment, consumable items, fuel, water, power charges and all other matters and things of what so ever nature essential and desirable to run the system satisfactorily. The year wise breakup of the payment is as under:

<u>PROVISION FOR PAYMENT OF 5 MLD STP CREATED UNDER THIS CONTRACT FOR FIFTEEN YEARS AS PER TENDER DOCUMENT UNDER HYBRID ANNUITY MODEL NEAR KAJRALI HOUSE, UDAIPUR</u>				
Sl. No.	Description of work	No. or Qty.	Unit	FIXED AMOUNT In DECIDED BY DEPARTMENT
1.	Cost for Completion and after one month of successful trial run as per Scope of Work & terms & conditions of contract etc complete			16000000
	For Year 1st of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 2 of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 3 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 4 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 5 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 6 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 7 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 8 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 9 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 10 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 11 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 12 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 13 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 14 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
	For Year 15 of of Operation of STPs created under this contract during one year	1.00	YEAR	1600000
Total in Figures		40000000		

<u>PROVISION FOR PAYMENT OF 10 MLD STP CREATED UNDER THIS CONTRACT FOR FIFTEEN YEARS AS PER TENDER DOCUMENT UNDER HYBRID ANNUITY MODEL NEAR FCI GODOWN, UDAIPUR</u>				
Sl. No.	Description of work	No. or Qty.	Unit	FIXED AMOUNT In DECIDED BY DEPARTMENT
1.	Cost for Completion and after one month of successful trial run as per Scope of Work & terms & conditions of contract etc complete			32000000
	For Year 1st of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 2 of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 3 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 4 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 5 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 6 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
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	For Year 11 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 12 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 13 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 14 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
	For Year 15 of of Operation of STPs created under this contract during one year	1.00	YEAR	3200000
Total in Figures		80000000		

PROVISION FOR PAYMENT OF 25 MLD STP CREATED UNDER THIS CONTRACT FOR FIFTEEN YEARS AS PER TENDER DOCUMENT UNDER HYBRID ANNUITY MODEL AT EKLINGPURA, UDAIPUR				
Sl. No.	Description of work	No. or Qty.	Unit	FIXED AMOUNT In DECIDED BY DEPARTMENT
1.	Cost for Completion and after one month of successful trial run as per Scope of Work & terms & conditions of contract etc complete			80000000
	For Year 1st of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 2 of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 3 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 4 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 5 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 6 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 7 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 8 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 9 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 10 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 11 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 12 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 13 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 14 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
	For Year 15 of of Operation of STPs created under this contract during one year	1.00	YEAR	8000000
Total in Figures		200000000		

3.2 REDUCTION OF RATES (RR)

3.2.1.1. The contractor shall maintain the complaint register in his office and shall note all complaints received through telephone, SMS and email.

3.2.1.2. In case of STP or any unit of STP is non-functional for 2 hrs then Rs. 2000.0 per happening will be deducted from Operating Annual bill. If non function period is more than 2 hrs and up to 4 hrs Rs. 5000.0 per happening will be deducted..

3.2.1.3. A token compensation of Rs. 1000 for unattended breakdown /over flow of any water retaining structure of STP, Leakages in STP structures if the delay in satisfactory completion of repair is beyond 12 hours from the time of each notice by the department.

3.2.1.4. In event of non-compliance of any of the effluent parameters stipulated in Tender during Operating period, a compensation of Rs 1000.00 per occurrence of non-compliance of any parameter stipulated in Tender will be deducted..

3.3 TAXES AND DUTIES

3.3.1The Contractor shall be responsible for paying all taxes/duties/cess including service tax, cess or any other levies imposed by the Government and assessed as due and payable by the Contractor associated with the carrying out of the services. Notwithstanding the provisions of any Clause of this Conditions of Contract for Operation and Maintenance, the Department shall be entitled to withhold or deduct from payment to the Contractor any amount demanded by the competent authority.

3.3.2All statutory deductions shall be made from all the payments done to the contractor.

3.4 USCL/ULB/UIT'S RIGHTS

3.4.1 Inspection

3.4.1.1. The Department may periodically check the operation of the Facility or designate an organization of its choice at the cost of Department to carry out inspections of the Facility to satisfy itself that the Contractor is performing its obligations with due diligence.

3.4.1.2. The Contractor at its own cost shall provide any assistance required for such inspection of the Facility.

3.4.1.3. The Department representative can inspect the facility at any moment during the Operating period.

4. TERMINATION

4.1 CONTRACTOR'S DEFAULT

4.1.1The ULB/Department shall be entitled to terminate this Contract for the following reasons attributable to the Contractor, unless arising as a result of a Force Majeure Event, or any cause related to the obligations of the Department in clause 4.5.

- a) Repudiation of this Contract by the Contractor or the evidencing of an intention by the Contractor not to be bound by the terms of this Contract.
- b) Appointment of a provisional liquidator in providing for winding up of the Contractor unless such appointment has been set-aside within 45 days.
- c) The Contractor is ordered to be wound up by a court or files a petition for voluntary winding up except for the purpose of amalgamation or reconstruction provided that such amalgamation or reconstruction does not adversely affect the ability of the amalgamated or reconstructed entity to perform its obligations under this Contract, the successor has assumed in writing unconditional responsibility for the performance of the Contractor's obligations and the technical, financial and operating capability of the successor is satisfactory to the Department.
- d) The Contractor abandons the operation of the Facility.
- e) Under conditions expressly mentioned in any Clause of this Conditions of Contract for Operation and Maintenance.

4.2 CONSEQUENCES OF TERMINATION BY DEPARTMENT

If the Department, with reasonable grounds, terminates the contract under clause 6.1 above, the Secured Advances, and any other sums of the contractor with the Department, shall be forfeited and action shall be taken against him as per clause 3 of General Conditions of Contract, if deemed appropriate.

5. INDEMNIFICATION

5.1.1 The Contractor to indemnify the Department against the following:

- (a) The Contractor shall at its own expense make good any physical loss or damage to the Facility occasioned by it in the course of the performance of its obligations under this Contract if and to the extent such loss or damage is caused by the willful misconduct or failure to follow Good Engineering Practices of the Contractor, any sub-contractor or their respective agents or employees.
- (b) The Contractor shall indemnify, defend and hold harmless the Department and its officers, employees, agents and affiliates against any and all claims of loss, damage and expense of whatever kind and nature, including all related costs and expenses incurred in connection therewith, in respect of personal injury to or death of third parties and in respect of loss of or damage to any third party to the extent that the same arises out of:
 - (i). Any breach by the Contractor of its obligations hereunder;

- (ii). Any negligent act or omission on the part of the Contractor, its subcontractors or their respective agents or employees; and
 - (iii). Any willful misconduct or breach of statutory duty on the part of the Contractor, its subcontractors or their respective agents and employees.
 - (iv). Any other event where such indemnification has been expressly mentioned in this Conditions of Contract for Operation and Maintenance.
- (c) The Contractor shall indemnify, defend and hold harmless the Department and its, officers, employees, agents and affiliates against any and all claims of loss, damage and expense of whatever kind and nature, including all related costs and expenses incurred in connection therewith in respect of the death or injury to any person employed by the Contractor or its subcontractors in connection with the performance of the Contractor's obligations.

5.1.2 The Contractor shall indemnify the Department against all losses and claims in respect of:

- (a) Death of or injury to any person, or,
- (b) Loss of or damage to any property (other than the Works).

which may arise out of / in consequence of the Operation and Maintenance of the Facility and the remedying of any defects therein, and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto, subject to the exceptions below

- (i). The permanent use or occupation of land by the Facility, or any part thereof.
- (ii). The right of the Department to execute the Facility, or any part thereof, on, over, under, in or through any land.
- (iii). Damage to property that is the unavoidable result of the execution and completion of the Works, or the remedying of any defects therein, in accordance with the contract.

6. INTELLECTUAL PROPERTY

6.1.1 All Intellectual Property conceived, originated, devised, developed or created by the Contractor specifically for the Facility or the carrying out of the obligations under this Contract shall vest in the Department as sole beneficial owner and shall be disclosed to the Department upon its [the Intellectual Properties] coming into existence.

6.1.2 Source code for computer programmers and associated documentation, storage media shall be made available to the Department by the Contractor free of cost

6.1.3 Any Intellectual Property of the Department that is required in connection with the performance of the obligations of the Contractor shall be made available to the Contractor free of charge for the purposes of this Contract alone

6.1.4 The Contractor shall, at its own cost and expense, ensure availability at all times during the Term of this Conditions of Contract for Operation and Maintenance, of any proprietary spares/consumables/equipment that it may have sourced for purposes of ensuring proper functioning of the Facility as per this Conditions of Contract for Operation and Maintenance.

6.1.5 The Contractor shall, as far as practicable, use its best efforts

- (a) To procure that Intellectual Property owned or developed by third parties and utilized by the Contractor in connection with the performance of its obligations under this Contract for the production of treated water from the Facility and otherwise for the Facility but for no other purpose on reasonable terms
- (b) To ensure that no Intellectual Property of a third party is otherwise used in the performance of the Contractor's obligations under this Contract without the approval from the Department.

On Termination of this Conditions of Contract for Operation and Maintenance, the Contractor shall transfer all such Intellectual Property whatsoever to the Department and/or to the Successor Operator at the discretion of the Department.

7. PRICE ESCALATION FOR THE OPERATING PERIOD:

No price escalation shall be payable during the Operating period.

Section VI C: Contract Forms

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1. Letter of Acceptance**Letter of Acceptance*****[on letterhead paper of the Procuring Entity]***

No.

Dated

To: ***[name and address of the Contractor]***Subject: ***[Notification of Award for the Works]***

This is to notify you that your Bid dated ***[date]*** for execution of the .
 ***[name of the contract and identification number, as given in
 the Contract Data]*** for the Accepted Contract Amount of the
 equivalent of ***[amount in numbers and words and name of
 currency]*** , as corrected and modified in negotiations and in
 accordance with the Instructions to Bidders has been accepted by
[designation of the Procuring Entity] The date of
 commencement and completion of the Works shall be:

You are requested to furnish the Performance Security/ Performance Security
 Declaration within Days in the form given in the Contract Forms for
 the same for an amount equivalent to Rupees within days
 of notification of the award valid up to 60 days after the date of expiry of
 Defects Liability Period and maintenance period, if applicable, and sign the
 Contract, failing which action as stated in sub-section 2 of section 42 of the
 Rajasthan Transparency in Public Procurement Act, 2012 and Instructions to
 Bidders shall be taken.

Authorized Signature:

Name and Title of Signatory: Chief Executive Officer,
Udaipur Smart City Limited.

Designation:

2A. Contract Agreement (1) With Udaipur Smart City Limited**Contract Agreement**

THIS AGREEMENT made theday of,, between the Governor of Rajasthan/ **[Udaipur Smart City Limited]**. (hereinafter “the Procuring Entity”) which expression shall, where the context so admits, be deemed to include his successors in office and assigns, of the one part, and **[name of the Contractor]**(hereinafter “the Contractor”), which expression shall, where the context so admits, be deemed to include his heirs, successors, executors and administrators, of the other part:

WHEREAS the *Procuring Entity* desires that the Works known as **[name of the Contract]**should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein, and for which the Contractor has submitted Performance Security for Rupees ----- in the form of -----
----- (For Udaipur Smart City Limited)

The Procuring Entity and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - a) the Letter of Acceptance;
 - b) the Bid of the Contractor as accepted along with the correspondence done on it, if any;
 - c) the Special Conditions of Contract/ Contract Data;
 - d) the General Conditions of Contract;
 - e) the Specifications;
 - f) the Drawings; and
 - g) the Instructions to Bidders and Notice Inviting Bids.
3. In consideration of the payments to be made by the Procuring Entity to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Procuring Entity to execute the Works and to remedy defects therein (and, if applicable, maintain the Works for a period of -----) in conformity in all respects with the provisions of the Contract.

4. The Procuring Entity hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein (and, if applicable, maintain the Works for a period of -----), the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of India and Rajasthan on the day, month and year indicated above.

Signed by

Signed by.....

for and on behalf of the Governor/ Palika Entity
(Chief Executive Officer, Udaipur Smart City Limited)

.for and on behalf the Contractor

in the presence of

in the presence of

Witness, Name, Signature, Address, Date

Witness, Name, Signature,
Address, Date

3A. Performance Security**Performance Security**

..... **[Bank's Name, and Address of Issuing Branch or Office]**

Beneficiary: **[Name and Address of Procuring Entity (Chief Executive Officer, Udaipur Smart City Limited)]**

Date:

Performance Guarantee No.:

We have been informed that **[name of the Contractor]** (hereinafter called "the Contractor") has entered into Contract No. **[reference number of the Contract]**. dated with you, for the execution of **[name of contract and brief description of Works]** (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance security is required.

At the request of the Contractor, we **[name of the Bank]** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of Rupees* **[amount in figures]** (Rupees..... **[amount in words]**) such sum being payable upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

The Guarantor agrees to extend this guarantee for a specified period in response to the Procuring Entity's written request for such extension for that specified period, provided that such request is presented to the Guarantor before the expiry of the guarantee.

This guarantee shall expire, no later than the Day of , **, and any demand for payment under it must be received by us at this office on or before that date.

.....
Seal of Bank and Authorised Signature(s)

**** The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract***

***** Insert the date sixty days after the expected completion date, including defect liability period and maintenance period, if any.***

Notes: ***1. All italicized text is for guidance on how to prepare this advance payment guarantee and shall be deleted from the final document.***

2. The Procuring Entity should note that in the event of an extension of the time for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

4. Performance Security Declaration

Form of Performance Security Declaration

Date: _____ ***[insert date (as day, month and year)]***

Contract Name and No.: _____ ***[insert name and number of Contract]***

To: _____ ***[insert Designation and complete address of Procuring Entity]***

We, the undersigned, declare that:

We understand that, according to your conditions, the Contract must be supported by a Performance Security Declaration as a guarantee to ensure fulfillment of our all performance obligations under the Contract for _____ ***[insert name of subject matter of procurement]***.

We accept that we will automatically be suspended from being eligible for bidding in any contract with you for the period of time of _____ ***[Procuring Entity to indicate here the period of time for which the Procuring Entity will declare a Bidder ineligible to be awarded a Contract if the performance Security Declaration is to be executed]*** starting on the date that we receive a notification from you, the _____ ***[Designation of the Procuring Entity]*** that our Performance Security Declaration is executed, if we are in breach of any of our performance obligation under the conditions of the Contract,

We understand this Performance Security Declaration shall expire after 60 days of completion of our all obligations under the Contract including Defect Liability, warranty/ Guarantee, operation, maintenance, etc. in accordance with the conditions of the Contract.

Signed: _____

[insert signature of person whose name and capacity are shown]

In the capacity of: _____

[insert legal capacity of person signing the Performance Security Declaration]

Name: _____

[insert complete name of person signing the Declaration]

Duly authorized to sign the Contract for and on behalf of: _____

[insert complete name and address of the Bidder]

Dated on _____ day of _____, _____ ***[insert date of signing]***

Corporate Seal _____

Contract Agreement Works

THIS AGREEMENT made this .day of . 201.., between Udaipur Smart City Limited, represented by the Chief Executive Officer Ph. 02974-2421255 E-mail: mc_udaipur@rediffmail.com (hereinafter "the Employer"), of the one part and **M/S** (herein after "the Contractor"), of the other part:

WHEREAS the *Employer* desires that the Works known as **Design, construction, supply, installation, testing and commissioning and operating for 15 years under Hybrid Annuity Model (Which will include all Civil, Mechanical, electrical, instrumentation & other necessary works) of STP's (25 MLD + 10 MLD + 5 MLD) based on SBR Process (equivalent or higher process) having provision for reuse of 50% treated water of Udaipur Town**

should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein for one year and thereafter O & M of assets created under this contract for 10 years in conformity with the provisions of the contract in all respect.

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - a) Notice to Proceed
 - b) the Letter of Acceptance;
 - c) the Bid
 - d) the Addenda and Corrigendum
 - e) the Special Conditions
 - f) the General Conditions
 - g) the Specifications;
 - h) the Drawings;
 - i) Instructions to Bidders and Notice Inviting Bids
 - j) the Priced Bill of Quantities and

- k) The Schedule of Supplementary information,
3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
 4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of India on the day, month and year indicated above.

Signed by

Signed by

Chief Executive Officer,
Udaipur Smart City Limited.
for and on behalf of the Employer

for and on behalf the Contractor

Witness, Name, Signature, Address

Witness, Name, Signature, Address

PREAMBLE TO BILL OF QUANTITIES & PRICES**1.0 Preamble to Financial BID****1.1 Introduction**

A) The bidder shall quote his offer/rates for the work under this package in the BOQ downloaded from web site only and rates quoted on other BOQ or on old BOQ (if any) shall not be considered. The bidder are advice to up load the financial bid on latest BOQ downloaded from Web site.

B) Unless stated otherwise, all rates entered in the Bill of quantities shall be deemed to include the following:

- (a) Labour and all costs in connection with the execution, completion, testing and commissioning of the work.
- (b) The supply of materials, goods, storage and all costs in connection there with including wastage, shrinkage and delivery to Site.
- (c) Item of Excavation, Dismantling of Bituminous & Granular Courses & CC pavements and Road Restoration and no allowance will be made for wastage, working space, bulking or shrinkage, overlaps, re-handling and the like.
- (d) Plant, equipment and all costs in connection therewith.
- (e) Sampling and testing materials and goods, testing workmanship, providing, storing, packing and transporting samples to and from the place of testing.
- (f) Fixing, erecting, installing or placing of materials and goods in position.
- (g) Disposing of surplus and unsuitable materials and goods and excavated materials, including stacking, storing, loading, transporting and unloading.

- (h) All Temporary Works
- (i) Construction and maintenance of temporary access roads within the Site and of any roads required for access to any part of the Site for the purpose of carrying out the Works, taking into account that the access roads under the Contractor's maintenance control will also be used by the Procuring Entity and his staff's vehicles.
- (j) Construction, maintenance and removal, if required, of temporary Site drainage on the Site, and for ensuring that all drains are kept clear of debris and blockages at all times.
- (k) All general obligations, liabilities and risks involved in the execution and maintenance of the Works set forth or reasonably implied in the documents on which the Tender is based.
- (l) Establishment charges, overheads and profits.
- (m) Co-operating with other contractors if required.

The bidder shall enter rates in H schedules for the whole work as mentioned in Bid documents.

Abbreviations used in Bill of quantities and Rates have the meanings shown below.

mm	Millimeter	TS	Trunk Sewers
cm	Centimeter	WBM	Water bound Macadam road
m	Meter	IRC	Indian Road Congress
Km	Kilometer	CC	Cement Concrete
Sqm	Square Meter	CM	Cement Mortar
Cum	Cubic Meter	SFRC	Steel Fiber Reinforced Concrete
MT	Metric Tones	MORTH	Ministry of Shipping Road Transport And Highways
SWG	Standard Wire Gauge	BOQ	Bill of Quantity and Prices
RM	Running Meter		
No.	Numbers		

CI	Cast Iron
MS	Mild Steel
RCC	Reinforced Cement Concrete
Wt	Weight
Kg	Kilogram
L.S	Lump sum
Dia	Diameter
SW	Storm water
GMS	Galvanized Mild Steel
DI	Ductile Iron

2.0 GENERAL

- 2.1 The Contractor shall be deemed to have read and examined the Tender Documents before quoting the turnkey rates as per TD in BOQ. The Drawings, Specifications, Schedules etc. are to be considered as explanatory of each other and no advantage shall be taken of any omission in tender documents.
- 2.2 The Contractor shall be deemed to be fully conversant with and to have made full allowance in his Tender for the site conditions, the nature and complexity of the work to be undertaken, the other extensive development and construction work currently being or which may be executed on and around the Site and all changes in the nature and condition of the Site from that existing at the time of Tender.
- 2.3 The Turnkey rates quoted in the schedule shall be the all inclusive value for the work described in tender document and be deemed to include for all the Contractor's liabilities and obligations and all risks set forth or implied in the document and all matters and things necessary for the proper construction, of the Works including setting out, plant, labour, supervisor, materials, erection, power consumption, maintenance, insurance, profit, taxes and duties together with all general risks liabilities and obligations set out or implied in the Contract for construction and operating period.
- 2.4 Disposal of all excavated material shall be including of all load and lift and re-handling to disposal point as directed by EIC.
- 2.5 The Operating annuity have been fixed per year as stipulated in Section VI B of Tender Document and indicated in the BOQ.

2.6 Items Incidental to Work:

Following is the list of items incidental to work which are to be executed by Contractor but no separate payment shall be made. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the Drawings/Documents as being furnished or installed, but which are necessary and customary to be performed under this contract. The cost of such items shall deem to have been included in other BOQ items.

S No Items Incidental to Work

- (i) All topographic surveys and geotechnical investigations
- (ii) All constructions designs and drawings
- (iii) As built drawings
- (iv) Traffic diversions arrangements
- (v) Project Staff and manpower
- (vi) Project Office and Laboratory
- (vii) Construction safety equipment
- (viii) Environmental and social safeguard compliances
- (ix) Any other item necessary and customary to be performed under this contract