REQUEST FOR PROPOSAL (RFP)

Request for Proposal for Water Supply Augmentation & Supply, Installation, Commissioning, and Operation & Maintenance for Smart Water Meters & Related Infrastructure Work for Water Supply System of Dehradun city including Operation and maintenance for 5 years under "Smart City Mission" through e-Procurement.

DEHRADUN SMART CITY LIMITED (DSCL)

777, Saatvik Tower, Rajender Nagar,
Kaulagarh Road, Dehradun, 248001, Uttarakhand, India
Ph: 0135-270894, Fax: 0135-2750817

RFP No: 01/DSCL/19-20/NCB/WSA&SWM

Issued on: 24/07/2019

DISCLAIMER

The information contained in this Request for Proposal (RFP) document or subsequently provided to Bidders, whether verbally or in documentary form by or on behalf of Dehradun Smart City Limited or any of its employees or Transaction advisors, is provided to Bidders on the terms and conditions set out in this RFP document and any other terms and conditions subject to which such information is provided.

This RFP document is not an Agreement and is not an offer or invitation to any other party. The purpose of this RFP document is to provide the Bidders with information to assist the formulation of their Bid submission. This RFP document does not purport to contain all the information each Bidder may require. This RFP document may not be appropriate for all persons and it is not possible for DSCL and their employees or Transaction advisors to consider the investment objectives, financial situation and particular needs of each Bidder. Certain Bidders may have a better knowledge of the proposed Project than others. Each recipient must conduct its own analysis of the information contained in this RFP document or to correct any inaccuracies therein that may appear in this RFP document and is advised to carry out its own investigation into the proposed Project, the legislative and regulatory regimes which applies thereto and by and all matters pertinent to the proposed Project and to seek its own professional advice on the legal, financial, regulatory and taxation consequences of entering into any agreement or arrangement relating to the proposed Project.

DSCL and their employees and Transaction advisors make no representation or warranty and shall incur no liability under the Law of Contract, Tort, the Principles of Restitution or unjust enrichment or otherwise for any loss, expense or damage, accuracy, reliability or completeness of the RFP document, which may arise from or be incurred or suffered in connection with anything contained in this RFP, any matter deemed to form part of this RFP document, the award of the Project, the information and any other information supplied by or on behalf DSCL or their employees, any consultants or otherwise arising in any way from the selection process for the Project.

DSCL may in its absolute discretion, but without being under any obligation to do so, can amend or supplement the information/clauses/articles in this RFP document. The information that DSCL is in a position to furnish is limited to this RFP only. The information contained in the RFP must be kept confidential. Mere submission of a responsive Bid/ Bid does not ensure selection of the Bidder as Contractor.

NOTICE INVITING TENDER-IMPORTANT DATES

Sl. No.	Activity	Duration
1.	Bid Ref No.	01/DSCL/19-20/NCB/WSA&SWM
2.	Availability of Bid Documents	The Bid documents for this work shall be available from website http://uktenders.gov.in **from 24/07/2019 at 1000 Hours to 22/08/2019 up to 1000 Hours.**
3.	Pre-Bid Meeting	**03/08/2019 at 1500 Hours**. Bidder shall have to email their queries to agmproc-dscl@uk.gov.in on or before the pre-bid meeting date. Venue of Pre Bid Conference – Dehradun Smart City Limited, 777, Saatvik Tower, Rajender Nagar, Kaulagarh Road, Dehradun, 248001, Uttarakhand, India, Ph: 0135-2750894, Fax: 0135-2750817
4.	Pre-Bid Meeting Coordinator	**Mr. Surya Kotnala, Asst. General Manager (Procurement & Contract Management), Mob: +91 7060033338**
5.	Last date for downloading of Bid document from the E-procurement portal http://uktenders.gov.in	**22/08/2019 up to 1000 Hours**. The scan copy of the RFP document fees (Non-Refundable), Bid Security (EMD) and Affidavit shall be uploaded on the e-procurement website.
6.	Last date and time for Bid submission/ uploading of Bid in E-procurement	**22/08/2019 up to 1500 Hours**
7.	Submission of original documents i.e. RFP document fees (Non-Refundable), Bid Security (EMD) and Affidavit	**22/08/2019 up to 1530 Hours** Address for submission of original documents: Dehradun Smart City Limited, 777, Saatvik Tower, Rajender Nagar, Kaulagarh Road, Dehradun, 248001, Uttarakhand, India, Ph: 0135-2750894, Fax: 0135-2750817
8.	Time and date of opening of Technical Bids	The Technical Bids will be opened on line by the Authorized Officers on **22/08/2019 at 1600 Hours** in DSCL office.
9.	Date and time of opening of Financial Bids	Shall be informed later to technically qualified Bidders

NOTICE INVITING TENDER -IMPORTANT DATA

Bid Ref No.	01/DSCL/19-20/NCB/WSA&SWM	
Organization Name	Dehradun Smart City Limited (DSCL)	
Name of Work	Request for Proposal for Water Supply Augmentation & Supply, Installation, Commissioning, and Operation & Maintenance for Smart Water Meter & Related Infrastructure Work for Water Supply System of Dehradun city including Operation and maintenance for 5 years under "Smart City Mission" through e-procurement.	
Bid Type	National Competitive Bidding(NCB) Item Rate Mode	
Bid Currency	Indian National Rupees (INR) Only	
Payment Details	Bid validity period	180 days from the last date of Bid submission
	Project Duration	Implementation period –12 Months from the date of contract signing. Defect liability Period – 01 Years after the successful implementation period. Operation & Maintenance Period - 05 years after the successful implementation period.
	RFP Document Fees **(Non-refundable)**	INR 5,900/- (Indian Rupees Five Thousand Nine Hundred Only) including GST in the form of demand draft drawn in favor of "Chief Executive Officer, Dehradun Smart City Limited, payable at Dehradun"
	Bid Security (EMD)	INR 57, 60,000/- (Indian Rupees Fifty Seven Lakhs Sixty Thousand Only) in the form of Demand Draft/FDR payable at Dehradun or an unconditional Bank Guarantee issued in favor of "Chief Executive Officer, Dehradun Smart City Limited'.
Addendum/Corrigendum	**Any Addendum/Corrigendum will be published on website http:// uktenders.gov.in only.**	

SECTION-I
INSTRUCTIONS TO BIDDERS

Section I -Instructions to Bidders (ITB)

	General
1. Scope of Bid	1.1 The Employer as defined in the BDS invite bids for the construction of Works as described in these documents and referred to as "the works". The name and identification number of the works is provided in the BDS. The bidders may submit bid of the work detailed in the table given in the Notice Inviting Tender. 1.2 The successful Bidder will be expected to complete the Works by the Intended Completion Date specified in the Part I General Conditions of Contract. 1.3 Throughout these documents, (a) The terms "bid" and "tender" and their derivatives (bidder/ tenderer, bid/ tender, bidding/ tendering, etc.) are synonymous. (b) The term "in writing" means communicated in written form (e.g. by mail, e-mail, and fax, including if specified in the BDS, distributed or received through the electronic-procurement system used by the Employer) with proof of receipt; (c) if the context so requires, "singular" means "plural" and vice versa; and (d) "Day" means calendar day.
2. Source of Funds	2.1 The funds shall be made available by the Government of India & Government of Uttarakhand
3. Eligible Bidders	3.1 A Bidder may be a firm that is a private entity, a state-owned enterprise or institution subject to ITB 3.5 – or 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). In the case of a JV: (a) all partners shall be jointly and severally liable, and (b) 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. (c) JV will be allowed with a maximum no of 2 (two) firms 1 lead member +1 other member) (d) The bidder shall not alter its composition or legal status without the prior consent of the Procuring Entity / Employer.

	3.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of India. 3.3 Government of Uttarakhand considers a conflict of interest 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, and that such conflict of interest may contribute to or constitute a prohibited practice. DSCL will take appropriate actions, which include not financing the contract, if it determines that a conflict of interest has flawed the integrity of any procurement process. Consequently all Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if, including but not limited to: (a) they have controlling shareholders in common; or (b) they receive or have received any direct or indirect subsidy from any of them; or (c) they have the same legal representative for purposes of this bid; or (d) they 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 (e) influence the decisions of the Employer regarding this bidding process; or (f) A 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 Bid in which the party 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 (g) A Bidder participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; or (h) A Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer as Engineer for the contract. 3.4 A firm shall not be eligible to participate in any procurement activities under a Government-financed project while under sanction imposed by DSCL. A bid from a sanctioned firm will be rejected. 3.5 Government-owned enterprises shall be eligible only if they can establish that they are legally and financially autonomous and

	operate under commercial law, and that they are not a dependent agency of the Employer. 3.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request. 3.7 In case a prequalification process has been conducted prior to the bidding process, this bidding is open only to pre-qualified Bidders.. 3.8 Bidder should be registered in any State/Central Govt. organization.
	Bidding Documents
	Contents of Bidding Document
4. Sections of Bidding Document	4.1 The set of bidding documents comprises the documents listed below and should be read in conjunction with any addenda issued in accordance with Clause 6 of ITB. **PART 1** 1. Section I Instructions to Bidders (ITB) 2. Section II - Bid Data Sheet (BDS) 3. Section III - Evaluation and Qualification Criteria 4. Section IV - Bidding Forms 5. Section V – Part-1 Scope of Work 6. Section V – Part-2 Technical Specifications 7. Section V – Part-3 Drawings (if any) 8. Section VI General Conditions of Contract (GCC) 9. Section VII Particular Conditions of Contract (PCC) 10. Section VIII - Contract Forms **PART II** 1. Bill of Quantities (Price-Bid BOQ) 4.2 Bidding document will be available online on the website http://uktenders.gov.in. The bidder is expected to examine carefully all instructions, conditions of contract, Bid forms, terms and specifications, bill of quantities, Contract forms and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. Pursuant to clause 26.2 hereof, bids, which are not substantially responsive to the requirements of the Bid Documents, shall be rejected.
5. Clarification of Bidding Documents, Pre-	5.1 Prospective bidder requiring any clarification of the bidding document may notify the employer in writing by email on **agmproc-dscl@uk.gov.in**. The Employer will respond to any request for

bid Meeting & site visit	clarification received on or before the date of the pre-bid meeting. Copies of the employer's response will be uploaded in the e-procurement portal only including a description of the enquiry, but without identifying its source. 5.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself, on its own risk and responsibility, all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense. 5.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection. 5.4 If a pre-bid meeting is to be held, the bidder or his authorized representative is invited to attend it. Its date, time and address are given in the notice inviting tender. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. 5.5 The bidder is requested to submit any questions in writing on or before the pre bid meeting date in the format provided. 5.6 Minutes of the meeting, including the text of the questions raised (without identifying the source of the enquiry) and the responses given will be transmitted online (or otherwise). Any modifications of the bidding documents listed in Clause 4.1 of ITB, which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively online through the issue of an Addendum pursuant to Clause 6 of ITB and not through the minutes of the pre-bid meeting. 5.7 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.
6. Amendment of Bidding Documents	6.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addenda online. 6.2 Any addendum thus issued shall be part of the bidding documents**.**

	6.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer shall extend, as necessary, the deadline for submission of bids, in accordance with Clause **20.2 of ITB.**
	Preparation of Bids
7. Language of Bids	7.1 All documents relating to the Bid shall be in the language specified in the BDS.
8. Documents Comprising the Bid	8.1 The Bid shall comprise two envelopes submitted simultaneously online on the e-Government Procurement System (e-GPS) in accordance with ITB 20.1. One called the Technical Bid containing the documents listed in ITB 8.2 and the other the Price Bid containing the documents listed in ITB 8.3. 8.2 The Technical Bid shall comprise the following: (a) Letter of Technical Bid; (b) Bid Security, in accordance with ITB 12; (c) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 13.1; (d) documentary evidence in accordance with ITB 18.1 establishing the Bidder's qualifications to perform the contract; (e) Technical Proposal in accordance with ITB 15.1; (f) Any other document required in the BDS. 8.3 The Price Bid shall comprise the following: (a) Letter of Price Bid; Completed Price Schedules, in accordance with ITB 9 and 10, or as stipulated in the BDS. (b) Any other document required in the BDS. 8.4 In addition to the requirements under ITB 8.2, bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the agreement.
9. Bid Prices	9.1 The Contract shall be for the whole Works, as described in Clause 1.1 of ITB, based on the priced Bill of Quantities submitted by the Bidder. 9.2 The Price bid made by the contractor should exclude the GST and all other taxes and duties. For GST, refer GCC clause 41.1. Therefore, all the duties, taxes, royalties and other levies payable by the Contractor under the Contract, or for any other cause, shall be excluded in the rates, prices, and total Bid price submitted by the Bidder.

	9.3 The rates and prices quoted by the Bidder shall be fixed for the entire duration of the Contract and shall not be subjected to adjustment. 9.4 Provisional sum of 2 % of the awarded value of work shall be provided for the work of shifting of poles, cables, Telephone lines or other works approved by DSCL .The payment shall be paid to contractor on production of original bills and as per actual work done.
10. Currencies of Bid	10.1 The unit rates and the prices shall be quoted by the bidder entirely in Indian Rupees only.
11. Bid Validity	11.1 "Bids shall remain valid for a period specified in the BDS after the deadline date for bid submission specified in Clause 19.1 of ITB." 11.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by email. A bidder may refuse the request without 11.3 Forfeiting his Bid Security/ Earnest Money. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his earnest money for a period of the extension, and in compliance with Clause 12 of ITB in all respects.
12. Earnest Money	12.1 The Bidder shall furnish, as part of the Bid, Earnest Money, in the amount specified in the BDS. 12.2 The Earnest Money Deposit (EMD) shall, at the Bidder's option, be in the form of Fixed Deposit Receipt, Bank Guarantee of a scheduled commercial bank, issued in favor of the name given in the BDS& shall be valid for six months or more after the last date of receipt of bids. Earnest money will be deposited, physically, with officer calling tender, before last date of submission of tender. A scanned copy of earnest money document will be submitted along with the tender 12.3 Any bid not accompanied by an acceptable Earnest Money, shall be rejected by the Employer as non-responsive. 12.4 The Earnest Money of unsuccessful bidders will be returned within 60 days of the end of the Bid validity period specified in Clause 11.1 of ITB. 12.5 The Earnest Money of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Security.

	12.6 The Earnest Money may be forfeited: If the Bidder withdraws the Bid after bid opening (technical bid) during the period of Bid validity; (a) In the case of a successful Bidder, if the Bidder fails within the specified time limit to (b) Sign the Agreement; and/or (c) Furnish the required Performance Security.
13. Format and Signing of Bid	13.1 Bidders shall submit their Bid electronically. Procedures for submission, sealing and marking are outlined in the ITB16. 13.2 The Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign 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. The name and position held by each person signing the authorization must be typed or printed below the signature.
14. Cost of Bidding	14.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the **Employer** shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Bidding process.
15. Documents Comprising the Bid	15.1 The Bidder shall furnish, as part of the Technical Bid, a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section 4 (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.
	Bid Submission
16. Process of e-Bid Submission	16.1 **Instruction for Online Bid Submission** I. Instructions to the Bidders to submit the bids online through the procurement portal for Procurement at http://uktenders.gov.in. II. Possession of valid Digital Signature Certificate (DSC) and enrollment/registration of the contractors/bidders on the e-Procurement/e-tender portal are prerequisite for e- tendering. II. Bidder should read each and every rules/regulations for uploading the bid on the e-procurement portal. 16.2 **Submission of Original Documents**: The bidders are required to separately submit (i) original demand drafts towards the cost of bid document and registration on e-procurement website (if not previously

	registered) (as per RFP); and (ii) original bid security in approved form; and (iii) original affidavit regarding correctness of information furnished with bid document, in the office **specified in the BDS**, before the opening of the technical part of the Bid, either by registered/speed post/courier or by hand, failing which the bids will be declared non-responsive and will not be opened. Hard copy of rest of the bid or any other document is not to be submitted.
17. Alternative Bids	17.1 Unless otherwise specified **in the BDS**, alternative Bids shall not be considered.
18. Documents Establishing the Eligibility and Qualifications of the Bidder	18.1 To establish its qualifications to perform the Contract in accordance with Section 3 (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding information sheets included in Section 4 (Bidding Forms).
19. Deadline for Submission of Bids	19.1 Bids must be uploaded online no later than the date and time **specified In the BDS**. 19.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the bidding document in accordance with ITB 6, In which case all rights and obligations of the Employer and Bidders previously subject to the dead line shall thereafter be subject to the dead line as extended.
20. Late Bids	20.1 The electronic bidding system would not allow any late submission of bids after due date & time as per server time.
21. Withdrawal , Substitution, and Modification of Bids	21.1 A Bidder may withdraw, substitute, or modify its Bid – Technical or Price prior to deadline for submission of Bids.
	Bid Opening
22. Opening of Technical Bids	22.1 The Employer will open the bids received, on line in the presence of the bidders/bidders' representatives who choose to attend at the time, date and place specified in the BDS. In the event of the specified date for the submission of bids being declared a holiday for the Employer, the Bids will be opened at the appointed time online on the next working day. 22.2 The technical bid shall be opened online. 22.3 The Employer will prepare minutes of the Bid opening, including the information disclosed to those present in accordance with Clause 22.1 of ITB. 22.4 Evaluation of the technical bids with respect to bid security, qualification information and other information furnished in Part I of

	the bid in pursuant to Clause 4.1 of ITB, shall be taken up and at the end of evaluation of technical bid a list will be drawn up of the responsive bids whose financial bids are eligible for consideration. 22.5 The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bid being substantially non-responsive to the requirements of the Bidding Document. 22.6 At the time of the opening of the 'Financial Bid', the names of the bidders whose bids were found responsive in accordance with clause 22(iv) of ITB will be announced. The financial bids of only these bidders will be opened. The responsive bidders' names, the Bid prices, the total amount of each bid, and such other details as the Employer may consider appropriate will be announced by the Employer at the time of bid opening. Any Bid price, which is not read out and recorded, will not be taken into account in Bid Evaluation. 22.7 The Employer shall prepare the minutes of the opening of the Financial Bids. 22.8 Process to be Confidential 22.9 Information relating to the examination, clarification, evaluation, and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any attempt by a Bidder to influence the Employer's processing of bids or award decisions may result in the rejection of his Bid 22.10 Clarification of Bids and Contacting the Employer 22.11 No Bidder shall contact the Employer on any matter relating to its bid from the time of the bid opening to the time the contract is awarded. 22.12 Any attempt by the bidder to influence the Employer's bid evaluation, bid comparison or contract award decision may result in the rejection of his bid. 22.13 Examination of Bids and Determination of Responsiveness 22.14 During the detailed evaluation of "Technical Bids", the Employer will determine whether each Bid (a) meets the eligibility

	criteria defined in Clauses 3 and 4; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the bidding documents. During the detailed evaluation of the "Financial Bids", the responsiveness of the bids will be further determined with respect to the remaining bid conditions, i.e., priced bill of quantities, technical specifications and drawings. 22.15 A substantially responsive "Financial Bid" is one that conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Works; (b) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other Bidders presenting substantially responsive bids. 22.16 If a "Financial Bid" is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.
	Evaluation and Comparison of Bid
23. Confidentiality	23.1 Information relating to the examination, evaluation, comparison, and post qualification of Bid 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. 23.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bid or Contract award decisions may result in the rejection of its Bid.
	23.3 Notwithstanding ITB 23.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it may do so in writing.
24. Clarification of Bids	24.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bid, the Employer may, at its discretion, ask any Bidder for a clarification of its bid or submission in original, of any document submitted in the electronic bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors

	discovered by the Employer in the evaluation of the Price Bid, in accordance with ITB 27. 24.2 If a Bidder does not provide clarifications of its Bid by the date and time set In the Employer's request for clarification, its Bid may be rejected.
25. Deviations, Reservations, and Omissions	25.1 During the evaluation of Bids, the following definitions apply: (a) "Deviation" is a departure from the requirements specified In the bidding document; (b) "Reservation" is the setting of limiting conditions or with holding from complete acceptance of the requirements specified In the bidding document; and "Omission" is the failure to submit part or all of the Information or documentation required In the bidding document.
26. Preliminary Examination of Technical Bid	26.1 The Employer shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB Sub-Clause 8.2 have been provided, and to determine the completeness of each document submitted.
	26.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the offer shall be rejected. (a) Letter of Technical Bid; (b) Written confirmation of authorization to commit the Bidder; (c) Bid Security, if applicable; and (d) Technical Proposal in accordance with ITB15.
27. Correction of errors	27.1 The e-procurement system automatically calculates the total amount from unit rates and quantities and the system also automatically populates the amount in words from the amount In figures and therefore there is no scope of discrepancy and need for arithmetic correction
28. Evaluation of Price Bid	28.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted. 28.2 To evaluate the Price Bid, the Employer shall consider the following: 28.3 the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurement contracts, or Schedule of Prices for lump sum contracts, but including Day work items, where priced competitively; 28.4 price adjustment for correction of arithmetic errors in accordance with ITB 27.1;

	28.5 price adjustment due to discounts offered in accordance with ITB 17.4; 28.6 adjustment for nonconformities in accordance with ITB 30.3; 28.7 application of all the evaluation factors indicated in Section 3 (Evaluation and Qualification Criteria); 28.8 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation. 28.9 If the Bid in an admeasurement contract, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses 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 analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract. The increase in performance security shall be evaluated as per procedures specified in BDS.
29. Employer's Right to accept any Bid and to Reject any or all Bids	29.1 Employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.
	Award of Contract
30. Award Criteria	30.1 The Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid for aggregate Engineer construction and operation & maintenance and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily
31. Notification of Award	31.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, via the Letter of Acceptance/Award included in the Contract Forms, that its bid has been accepted. 31.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract. 30.3 At the same time, the Employer shall also notify all other Bidders of the results of the bidding, and shall publish in an English

	language newspaper or well-known and freely accessible website the results identifying the bid and contract numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at Bid Opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose Bid were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the Price it offered, as well as the duration and summary scope of the contract awarded. After publication of the award, unsuccessful bidders may request in writing to the Employer for a debriefing seeking explanations on the grounds on which their Bid were not selected. The Employer shall promptly respond in writing to any unsuccessful Bidder who, after publication of contract award, requests a debriefing.
32. Signing of Contract	32.1 Promptly after notification, the Employer shall send the successful Bidder the Contract Agreement. 32.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.
33. Performance Security	33.1 Within 21 (twenty one) days after receipt of the Letter of Acceptance/Award, the successful Bidder shall deliver to the Employer a Performance Security of ten (10%) of the Contract Price, valid up to 60 days beyond the date of completion of all the contractual obligations including any O&M period. 33.2 The performance security shall be either in the form of an unconditional Bank Guarantee or fixed deposit Receipts (FDR), in favor of Chief Executive Officer, Dehradun Smart City Limited Payable at Dehradun, Uttarakhand, from a Scheduled Commercial Bank. 33.3 Failure of the successful Bidder to comply with the requirements of Clause 32.1.shall constitutes sufficient grounds for cancellation of the award and forfeiture of the Earnest Money. He will also be debarred from participating in future bids under Dehradun Smart City Limited.
34. Advances:	34.1 The employer will provide mobilization advances and advance against security of equipment as provided in Part I General Condition of Contract. If specified in the tender document.
35. Corrupt or Fraudulent Practices	35.1 The Employer requires the bidders/Contractors to strictly observe the laws against fraud and corruption in force in India, namely, Prevention of Corruption Act, 1988.

SECTION II

BID DATA SHEET (BDS)

Section II – Bid Data Sheet (BDS)

ITB Reference	A. General
ITB 1.1	The number of the Invitation for Bids is: 01/DSCL/19-20/NCB/WSA&SWM The Employer is: Chief Executive Officer, Dehradun Smart City Limited The name of the RFP is: Request for Proposal for Water Supply Augmentation & Supply, Installation, Commissioning, and Operation & Maintenance for Smart Water Meter & Related Infrastructure Work for Water Supply System of Dehradun city including Operation and maintenance for 5 years under "Smart City Mission" through e-procurement.
	Contents of Bidding Document
ITB 5.1	**For clarification purpose only,** the Employer address is: Dehradun Smart City Limited, 777, Saatvik Tower , Rajender Nagar, Kaulagarh Road, Dehradun-248001, Uttarakhand, Email : agmproc-dscl@uk.gov.in
ITB 5.2	A Pre-Bid meeting ***shall*** take place. Place: Dehradun Smart City Limited, 777, Saatvik Tower , Rajender Nagar, Kaulagarh Road, Dehradun-248001, Uttarakhand, Email : agmproc-dscl@uk.gov.in **Date: 03/08/2019** **Time: 1500 Hours onwards**
ITB 6.1	Any addendum/clarification shall be uploaded on the portal http://uktenders.gov.in only
	Preparation of Bids
ITB 7.1	The language of the bid is : English
ITB 8.2	The Bidder should also refer to the checklist enclosed in the RFP for submission of the documents.
ITB 9.2	The rates quoted by the Contractor shall be exclusive of GST which will be paid /adjusted by the client at the time of payment of the bills of the Contractor and shall be deemed to be Inclusive of other taxes that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties In regard to the deduction of such taxes at source [TDS] as per applicable law.
ITB 11.1	The Bid validity period shall be 180 **days**.
ITB 12.1	The bidder shall furnish a Bid Security/EMD for an amount of **INR 57.60 Lakhs Only)** valid till 45 days beyond the validity of Bids i.e. (180+45 days).
ITB 12.2	The Bid Security/EMD shall be in the form of Demand Draft/FDR/TDR payable at Dehradun or an Unconditional Bank Guarantee issued in favor of Chief Executive Officer, Dehradun Smart City Limited.

ITB 13.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of Legally Enforceable Power of Attorney.
	Bid Submission
ITB 16.2	The date and time for submission of original documents like RFP Document Fees(Non-Refundable), Bid Security/EMD and Affidavit for Correctness of Bid is: **Date: 22/08/2019** **Time: Up to 1530 Hours (Afternoon)** Place: Dehradun Smart City Limited, 777, Saatvik Tower , Rajender Nagar, Kaulagarh Road, Dehradun-248001, Uttarakhand
ITB 17.1	Alternative Bids shall not be permitted.
ITB 19.1	The deadline for uploading the Bids is: **Date: 22/08/2019** **Time: Up to 1500 Hours** Place: Dehradun Smart City Limited, 777, Saatvik Tower , Rajender Nagar, Kaulagarh Road, Dehradun-248001, Uttarakhand
	Bid Opening
ITB 22.1	The online Bid opening of Technical Parts of Bids shall take place at: Dehradun Smart City Limited, 777, Saatvik Tower, Rajender Nagar, Kaulagarh Road, Dehradun-248001, Uttarakhand. **Date: 22/08/2019** **Time: 1600 Hours**
ITB 28.9	The amount of additional performance security shall be worked out as follows: 1. No additional performance security for items up to 5% below the estimated item rates. 2. From 5% below to 15% below the estimated rate an additional performance security of 0.50% of the estimated cost of the item for every 1% below the estimated rate. 3. For more than 15% below the estimated rate, an additional performance security of 1% of the estimated cost of the item for every 1% below the estimated cost.

SECTION III

EVALUATION AND QUALIFICATION CRITERIA

Section III - Evaluation and Qualification Criteria

1.0 EVALUATION

The bidder shall fulfill the following qualifying requirements:-

1.1 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 and fully in accordance with the requirements stipulated in Section 5 (Scope of Work).

Non-compliance with equipment and personnel requirements described in Section 5 (Scope of Work) shall not be grounds for bid rejection and such non-compliance will be subject to clarification and rectification prior to contract award.

2.0 Qualification Criteria

The Technical Bids will be evaluated based on the following criteria

No	Criteria	Requirement	Compliance Requirements				Submission Requirements
			Single Entity	Joint Venture (existing or Intended) where permitted			
				All members Combined	At least one Member	Each Member	
1	Net Worth	As a minimum and the bidder's net worth calculated as the difference between total assets and total liabilities should be positive. Submission of audited balance sheets for the last Financial years 2017-2018 *to* demonstrate the current soundness of the bidder's financial position and its prospective long-term profitability. **Minimum Net-Worth Required is INR 8.15 Crores**	Must meet requirement	Must meet requirements	Must meet requirement	N/A	Form Fin 1
2	Annual Construction Turnover	The Bidder shall have minimum annual turnover in any of the last five financial years for a value of **INR 32.59 Crores Only.**	Must meet requirement	Must meet requirements	Must meet 50% of the requirement	Must meet 25% of the requirement	Form Fin 2

3 (a)	**Specific Construction Experience in Similar works**	**Experience** Bidder should have successfully completed as a prime contractor, JV member, management contractor or sub-contractor at least One Water Supply Scheme Project of contract value of at least INR 26.00 CRORE OR Two Water Supply Scheme Projects of contract value of at least INR 16.30 CRORE (each) Note: For Electrical works, the bidder should possess a valid Electrical license.	Must meet requirement	Must meet requirement (Maximum No. of Orders to achieve the said value is 2 Nos.)	Must meet 50% of the requirement	Must meet 25% of the requirement	Form EXP 2(a) with attachments
3 (b)	**Specific Construction Experience in Similar works**	Experience of Supply & Installation of water meters for the size of 15 mm to 100 mm for drinking water supply project and operation and maintenance for the period of at least three years as below. **a)** At least one "similar works" of Supply, Installation, operation & maintenance of at least 5200 water meters in quantity. OR **b)** At least two "similar works" of Supply, Installation, operation & maintenance of at least 3250 water meters in quantity OR **c)** At least three "similar works" of Supply, Installation, operation & maintenance of at least 2600 water meters in quantity	Must meet requirement	Must meet requirement	Must meet requirement	Not Applicable	Form EXP 2(a) with attachments
3 (c)	**Specific Construction Experience in Similar works**	Water Supply Distributions or Rising Mains of 100 to 400 mm dia of DI,S/S,D/F pipes of total length of 20 Kilometre	Must meet requirement	Must meet requirement	Must meet requirement	Not Applicable	Form EXP 2(a) with attachments

3 (c)	**Specific Construction Experience in Similar works**	Construction of Tube Well minimum 30 mm dia & 220 meter deep including all electrical & mechanical works and automation of tube well – minimum 01 No	Must meet requirement	Must meet requirement	Must meet requirement	Not Applicable	Form EXP 2(a) with attachments

D. **Key Personnel**

The Bidder must demonstrate that he have suitably qualified (and in adequate numbers) minimum Key Personnel, as described in the Table below, those are required to perform the Contract. The Bidder shall provide details of the Key Personnel and such other Key Personnel that the Bidder considers appropriate, together with their academic qualifications and work experience. The Bidder shall complete the relevant Forms in Section IV, Bidding Forms. Bidder shall require the Employer's consent to substitute or replace the Key Personnel (reference the General Conditions of Contract 9.1) with equivalent or better qualifications only.

Sl No.	Position	Qualification	Number	Total years of work Experience	Similar Work Experience
1	Project Manager (Civil)	BE/Diploma in Civil Engineering or Equivalent	2	10/15	5
2	Construction Manager	BE/Diploma in Civil Engineering or Equivalent	2	08	5
3	Survey Engineer	Diploma in Civil	1	7	5
4	Site Engineer (civil)	Diploma in civil Engineering	4	5	3
5	Site Engineer(MEP)	Diploma in Electrical/mechanical Engineering	2	6	3
6	Supervisors	12th pass	4	10	7
7	Electricians	ITI in Electrical Engineering	2	7	3
8	Fitter	ITI	1	7	3

9	Safety Officer	Diploma in safety engineering with certificate in Fire &Safety	1	7	3

Note: - The list of the Technical persons as mentioned above is tentative. Engineer of the project nominated from DSCL may modify the above list of the Technical persons as per the project requirements.

4.1 **For field testing laboratory (following shall also be treated as key personnel):**

S. No.	Technical Personnel	Qualification	Experience In Infrastructure Works	Number
1	Quality Control & Material Engineer	Degree Holder in civil Engineering	5 Years	2 No.
2	Lab Technician	Diploma holder In Civil Engineering or equivalent	3 Years	4 No.

Note: - The list of the Technical persons as mentioned above is tentative. Engineer of the project nominated from DSCL may modify the above list of the Technical persons as per the project requirements.

2.1 Equipment's

2.1.1 List of minimum key equipment's to be deployed for Work (Electrical/ Infrastructure works)

Sl. No.	List of Equipment	Minimum required	Capacity	Available	Own/ Lease
	During Execution				
1	Excavators and Dozers	1	1.25 CUM		
2	TRUCKS	4	10 TONNE		
3	HYDRA CRANE	1			
4	MINI VIBRATORY ROLLER	2			
5	WATER TANKER	4	6 KL		
6	MIXER MACHINE	2			

Note: - The list of the equipment and plants as mentioned above are tentative. Engineer of the project nominated from DSCL may modify the above list of the equipments as per the project requirements. It is Preferred that the bidder submit the List of Electrical T & P also.

Note: The required format provided in the bid document should be filled for all the equipment mentioned above

SECTION IV

BIDDING FORMS

Note: Each filled form should contain the Project Name and RFP Ref No.

Letter of Technical Bid

Ref No._____ Date of Bid submission: _____
RFP No.: _____

To: The Chief Executive Officer,
Dehradun Smart City Limited,
777, Saatvik Tower, Rajender Nagar,
Kaulagarh Road, Dehradun-248001, Uttarakhand

We, the undersigned, declare that:

We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB-8);

We offer to execute works in conformity with the Bidding Documents the following Work/s: _____.
Our bid shall be valid for a period of 180 days from the bid submission due date in accordance with the bidding documents, and it shall remain binding up on us and may be accepted at any time before the expiration of that period;

If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;

We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 3.3;

We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB3.3,

Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by Government of Uttarakhand (GoUK)/ Government of India (GoI) or any of its undertakings/ Other Departments any State Government, any public sector unit or any Local Body.

We are not a government owned entity / We are a government owned entity but meet the requirements of ITB 3.5;*

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

We agree to permit Dehradun Smart City Limited or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by Dehradun Smart City Limited or Government of India.

Name.....
In the capacity of.....
Signed.....
Duly authorized to sign the Bid for and on behalf of.....
Date.....

Forms for Personnel

Form PER – 1: Proposed Personnel

Bidders should provide the names and details of the suitably qualified Personnel to meet the requirement specified in section 3 (Evaluation and Qualification Criteria) using the Form below for each candidate.

Sr. No.	Name of the Personnel	Proposed Position

Form PER – 2: Resume of Proposed Personnel

(The Bidder shall provide all the information requested below. Fields with asterisk (*) shall be used for evaluation)

Position*		
Personnel information	Name:	Date of birth:
	Professional qualifications:	
	Experience (No of years) :	
Present employment	Name of employer:	
	Address of employer:	
	Telephone:	Contact (manager / personnel officer):
	Fax:	E-mail:
	Job title:	Years with present employer:

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From*	To*	Company	Position	Relevant Technical and Management Experience

Forms for Equipment

The Bidder shall provide adequate Information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed In Section III (Evaluation and Qualification Criteria). A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

Type of Equipment*		
Equipment Information	Name of manufacturer,	Model and power rating
	Capacity	Year of manufacture
Current Status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment ☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured	

Site Organization
[Insert Site Organization Information]

Method statement

[Insert method Statement – A detailed note should be submitted outlining bidders proposed methodology and program of construction including Environmental and Social Management Plan, backed with equipment, materials and manpower planning and deployment, duly supported with broad calculations and quality control system/assurance procedures proposed to be adopted, justifying their capability of execution and completion of the work as per technical specifications within the stipulated review of completion as per mile stones]

Mobilization Schedule
[Insert Mobilization Schedule]

Construction Schedule

[Insert Construction Schedule in MS-Project/Primavera]

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 here under

Form ELI-1: Bidder's Information

Bidder's legal name	
In case of JV, legal name of each partner	
Bidder's country of constitution	
Bidder's year of constitution	
Bidder's legal address in country of constitution	
Bidder's authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	
Attached are copies of the following original documents. 1. In case of single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITB 3.1 and 3.2. 2. In case of a government-owned entity, any additional documents not covered under 1 above required to comply with ITB 3.5. 3. Authorization to represent the firm or JV named in above, in accordance with ITB 20.2. 4. In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1.	

Form EL -2: Information for JV Bidders

Bidder's legal name	
JV Partner's or Subcontractor's legal name	
JV Partner's or Subcontractor's country of constitution	
JV Partner's or Subcontractor's year of constitution	
JV Partner's or Subcontractor's legal address in country of constitution	
JV Partner's or Subcontractor's authorized representative information (name, address, telephone numbers, fax numbers, e-mail address)	
Attached are copies of the following original documents. 1. Articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and 4.2. 2. Authorization to represent the firm named above, in accordance with ITB 20.2. 3. In the case of government-owned entity, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5.	

Form LIT-1- Pending Litigation

Information on litigation history in which the bidder is involved.
(Each Bidder or member of a JV must fill in this form)

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria			
Year	Non-performed portion of contract	Contract Identification	Total Contract Amount (Rs)
[Insert year]	[Insert amount and percentage]	Contract identification: [Indicate complete contract name/ number, and any other identification] Name of Employer: [Insert full name] Address of Employer: [Insert street/city/country] Reason(s) for nonperformance: [Indicate maIn reason(s)]	[Insert amount]
Pending Litigation, in accordance with Section III, Evaluation and Qualification Criteria			
☐ No pending litigation in accordance with Section III, Evaluation and Qualification Criteria. ☐ Pending litigation In accordance with Section III, Evaluation and Qualification Criteria.			

Year of dispute	Amount In dispute (INR)	Contract Identification	Total Contract Amount (INR)
		Contract Identification: _____ Name of Employer: _____ Address of Employer: _____ Matter In dispute: _____ Party who Initiated the dispute: ____ Status of dispute: _____	
		Contract Identification: Name of Employer: Address of Employer: Matter In dispute: Party who Initiated the dispute: Status of dispute:	
Litigation History in accordance with Section III, Evaluation and Qualification Criteria			
☐ No Litigation History In accordance with Section III, Evaluation and Qualification Criteria ☐ Litigation History in accordance with Section III, Evaluation and Qualification Criteria, as indicated below.			
Year of award	Outcome as percentage of Net Worth	Contract Identification	Total Contract Amount (INR)

[Insert year]	[Insert percentage]	Contract Identification: [Indicate complete contract name, number, and any other identification] Name of Employer: [Insert full name] Address of Employer: [Insert street/city/country] Matter In dispute: [Indicate main issues In dispute] Party who Initiated the dispute: [Indicate "Employer" or "Contractor"] Reason(s) for Litigation and award decision [Indicate main reason(s)]	[Insert amount]

Form FIN – 1: Financial Situation and Performance
(Each Bidder or member of a JV must fill in this form)

Information from Balance Sheet			
	2017-18	2016-17	2015-16
Total Assets (TA)			
Total Liabilities (TL)			
Net Worth (NW)			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital (WC)			
Total Revenue (TR)			
Profits Before Taxes (PBT)			
Profits After Taxes (PAT)			
Cash Flow from Operating Activities			

Note: The figures filled by the bidder in the above format should also be certified by the Chartered Accountant.

☐ Attached are copies of financial statements for the last three years required above; and complying with the requirements (Last three years legible audited financial statements (Balance sheets and Profit and Loss Accounts) including enclosures/annexures/ schedules/attachments/appendix). Audit report is also attached.

Form FIN - 2: Average Annual Turnover
(Each Bidder or member of a JV must fill in this form)

Annual turnover data	
Year	Amount in INR
2017-18	
2016-17	
2015-16	
Average Annual Turnover *	

Annual construction turnover calculated as total certified payments received for work In progress or completed, for last three years(2015-16,2016-17,2017-18) of the Bidder and should be certified by a Chartered Accountant.

Form FIN – 3: Financial Resources

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

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified In Section III, Evaluation and Qualification Criteria.

Source of Financing	Amount (Rs)
1.	
2.	
3.	
4.	

Form FIN 4: Existing commitments and on-going works

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

Bidder should provide Information on their current commitments on all contracts that have been awarded, or for which a letter of Intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

(A) Existing commitments and on-going works:

Description of work	Employer Contact details (Address, Tel, Fax, Email)	Value of Contract (In INR)	Stipulated Period of Completion	Value Of Works* Remaining To Be Completed (In INR.) (A)	Anticipated Date of Completion	Remaining Contract Period in Months (B)	Monthly Financial Requirement (A/B)
Cumulative Financial Resources Requirement for Existing Commitment							INR…… ……..

(B) Works for which bids already submitted and likely to be awarded/ expected additional commitment.

Description of works	Employer Contact details (Address, Tel, Fax, Email)	Estimated Value of works (In INR)	Stipulated Period of Completion	Date when decision is expected	Remarks, if any

*Attached Certificate (s) from the Employer

Form EXP – 2 (a): Specific Construction Experience
[The following table shall be filled in for contracts performed by the Applicant]

Similar Contract No.	Information			
Contract Identification				
Award date				
Completion date				
Role of contractor	Prime Contractor	Member In JV	Management Contractor	Sub-contractor
Total Contract Amount			Rs *	
If member In a JV or subcontractor, specify participation In total Contract amount			*	
Employer's Name:				
Address: Telephone/fax number E-mail:				

Note:

☐ Attached are completion certificates from the competent authority not less than the rank of Executive Engineer of any State /Central government department or corporation.

Form of Bid Security, Bank Guarantee

.....Bank's Name, and Address of Issuing Branch or Office.....
Beneficiary: ..... Name and Address of Employer.....

Date:.....
.....

Bid Security No.:
We have been informed that . . . . . name of the Bidder (hereinafter called "the Bidder") has submitted to you its bid dated . . . . . (Hereinafter called "the Bid") for the execution of.....name of contract.....under Invitation for Bid No.....("the IFB").
Furthermore, we understand that, according to your conditions, Bid must be supported by a bid guarantee.

At the request of the Bidder, we . . . . . name of Bank hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of amount in figures. …….. (.....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:

has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or

does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB");or

Having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB.

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement 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 your notification to the Bidder of the name of the successful Bidder; or (ii) twenty-eight days after the expiration 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.

. . . . . Bank's seal and authorized signature(s) . . . . . .
Note: All italicized text is for use in preparing this form and shall be deleted from the final document
Letter of Price Bid

Ref No._____ Date of Bid submission: _____
RFP No.: _____

To: The Chief Executive Officer,

Dehradun Smart City Limited,
777, Saatvik Tower, Rajender Nagar,
Kaulagarh Road, Dehradun-248001, Uttarakhand

We, the undersigned, declare that:
We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB-6) ;
We offer to execute works in conformity with the Bidding Documents.
The discounts offered and the methodology for their application are:
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 Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
If our Bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;
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; and
We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
We agree to permit DSCL or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by DSCL or Government of India.
If awarded the contract, the person named below shall act as Contractor's Representative.

Name.....
In the capacity of.....
Signed.....
Duly authorized to sign the Bid for and on behalf of.....
Date.....

Format for Declaration by the bidder for not being Blacklisted / Debarred

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

(To be submitted on the Letterhead of the bidder)

Date: dd/mm/yyyy

To: The Chief Executive Officer,
Dehradun Smart City Limited,
777, Saatvik Tower, Rajender Nagar,
Kaulagarh Road, Dehradun-248001, Uttarakhand

Subject: Request for Proposal for Pedestrianization of Paltan Market in Dehradun City under "Smart City Mission" through e-procurement.
RFP Reference No:

Dear Sir/ Ma'am,

I, authorized representative of _____, hereby solemnly confirm that the _____ ("Successful bidder") is not debarred/ black -listed by Central Government/ any State Government/ Public Sector Undertaking in India or similar agencies globally for unsatisfactory past performance, corrupt, fraudulent or any other unethical business practices or for any other reason as on last date of submission of the bid.

In the event of any deviation from the factual information/ declaration, DEHRADUN SMART CITY LIMITED reserves the right to reject the bid or terminate the Contract without any compensation to the Company.

Thanking you,
Yours faithfully,

_____ _____
Signature of Authorized Signatory (with official seal)

Date:
Name:
Designation:
Address:
Telephone & Fax: E-mail address:

Format of sending pre-bid queries at agmproc-dscl@uk.gov.in

RFP Reference No:

Bidder's Request For Clarification				
Name and complete official address of Organization submitting query/request for clarification			Telephone, Fax and E-mail of the organization Tel: Fax: Email:	
S. No.	Clause No.	Page No.	Content Of RFP Requiring Clarification	Change Requested/ Clarification required
1				
2				

Signature:
Name of the Authorized signatory:
Company seal:
Date and Stamped

Note: Bidder(s) are requested to send the queries in PDF with Sign and Company Seal and also in MS Excel/word for making consolidation process easy.

Format for Power of Attorney

(On a non-judicial stamp paper of appropriate value duly attested by notary public)

Know all men by these presents, we (name and address of the registered office of the Sole Applicant) do hereby constitute, appoint and authorize Mr./Ms._____R/o _____ who is presently employed with us and holding the position of_____, to do in our name and on our behalf, all such acts, deeds and things, necessary in connection with or incidental to the bid for Request for Proposal for _____ including signing and submission of all documents and providing information/ responses to DEHRADUN SMART CITY LIMITED and representing us in all matters in connection with our bid for the said Project.

We hereby agree to ratify all acts, deeds and things lawfully done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall and shall always be deemed to have been done by us.

For (Signature)

(Name, Title and Address)

Accept

…… (Signature)

(Name, Title and Address of the Attorney)

Notes:

To be executed by the Applicant.
The mode of execution of Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure.
Also, wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as a resolution/ Power of attorney in favour of the Person executing this Power of Attorney for the delegation of power hereunder on behalf of the bidder.

FORMAT FOR AFFIDAVIT FOR CORRECTNESS OF BID

(To be given by the Bidder on non-judicial Stamp Paper of Rs. 100/-)
I.…………………...……….................. S/o …………..…………..…………..., Resident of the …………...……………….,
……………... (Insert designation) of the ………………………...…... (Insert name of the Bidder), do solemnly affirm and state as under:

1. That I am the authorized signatory of …………..(insert name of company) (hereinafter referred to as "Bidder") and I am duly authorized by the Board of Directors of the Bidder to swear and depose this Affidavit on behalf of the bidder.

2. That I have submitted information with respect to our eligibility for the "____________________________________(hereinafter referred to as "Project") and I further state that all the said information submitted by us is accurate, true and correct and is based on our records available with us.

3. That I hereby affirm to furnish any information, which may be requested by Authority to verify our credentials/information provided by us under this Bid and as may be deemed necessary by Authority.

4. That if any point of time till the completion of all the contractual obligations, in case Authority requests any further/additional information regarding our financial and/or technical capabilities, or any other relevant information, I shall promptly and immediately make available such information accurately and correctly to the satisfaction of Authority.

5. That I fully acknowledge and understand that furnishing of any false or misleading information by us in Bid shall entitle us to be disqualified from the tendering process for the said Project. The costs and risks for such disqualification shall be entirely borne by us.

6. That, we fully acknowledge and understand that in case any false or misleading information, as furnished by us in our Bid, is found at a later stage after the signing of the Contract Agreement amongst Authority and ………….. (Insert name of organization), it shall entitle DSCL to terminate the said signed Contract Agreement between the Parties. The costs and risks for such termination shall be entirely borne by us.

7. That all the terms and conditions of the Tender Document have been duly complied with.

VERIFICATION:
I, the above named deponent, do verify that the contents of points 1 to 7 of this affidavit are true and correct to my knowledge. No part of it is false and nothing material has been concealed.
Verified at ………………………, on this …………………. day of………….…….., 2019.

Checklist for Technical & Financial Bid

S. No.	Particulars	Yes/No	If Yes, Page No.
1	RFP Document Fees		
2	Bid Security/EMD		
3	Affidavit of Correctness of Bid		
4	Power of Attorney		
5	Undertaking to the effect that the company has not been black-listed(duly notarized)		
6	Copy of PAN CARD issued by income tax department with copy of income tax returns for the last three FY		
7	Copy of GST Registration Certificate		
8	Copy of Incorporation Certificate		
9	Letter of Technical Bid		
10	Form PER-1 for Personnel		
11	Form PER-2 for Personnel		
12	Form for Equipment		
13	Site Organization		
14	Method Statement		
15	Mobilization Schedule		
16	Construction Schedule		
17	Form ELI-1: Bidders Information		
18	Form LIT-1: Pending Litigation		
19	Form FIN-1: Financial Situation and Performance		
20	Form FIN-2: Average Annual Turnover		
21	Form FIN-3: Source of Financial Resource		
22	Form FIN-4: Existing Commitments & Ongoing Works		
23	Form EXP-1: General Construction Experience		
24	Form EXP-2: Specific Construction Experience		
25	Letter of Price Bid		
26	Audited Balance Sheets for the last three FY		
27	Any other relevant document		

SECTION 5
Part-1: Scope of Work

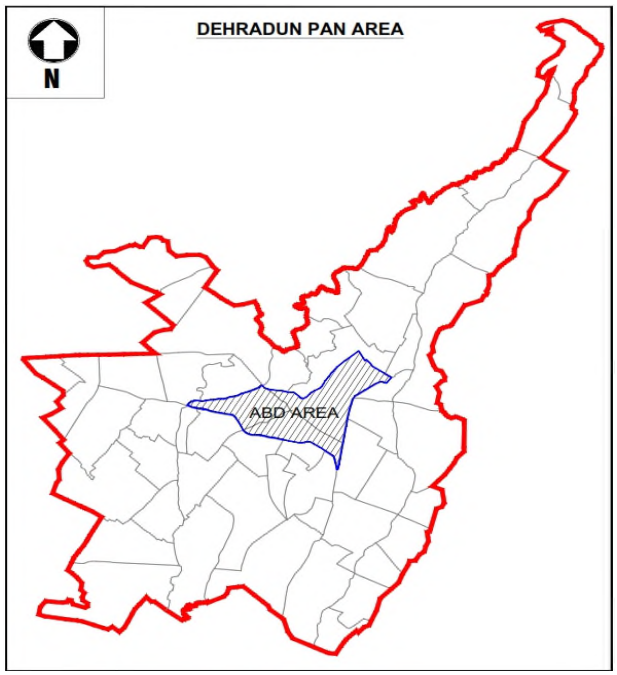
This Section contains the Specification, the Drawings, and supplementary information that describe the Works to be procured. The specifications of the Equipments mentioned in the documents shall govern; and the equipment supplied, installed by the Contractor shall comply with stipulated specifications. The make/ manufacturer of the equipment if mentioned inadvertently in the bidding document shall have no effect.

5. Objective of the Package

Government of India launched the Smart Cities Mission to enable the holistic development of Indian cities. This initiative under the Ministry of Urban Development (MoUD) aims to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens. According to MoUD, the core elements of a Smart City include: adequate water and electricity supply, suitable sanitation and solid waste management, efficient public transportation, affordable housing, robust IT connectivity and digitalization, e-governance with citizen participation, sustainable environment, and safety and security of citizens with health and education for all. These objectives are proposed to be attained through a judicious mix of retrofitting, redevelopment and Greenfield development.

In the approach of the Smart Cities Mission, the objective is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. The focus is on sustainable and inclusive development and the idea is to look at compact areas, create a replicable model which will act like a light house to other aspiring cities.

Dehradun the capital city of Uttarakhand was included in the Smart City Program – given it's importance as a State Capital and also a gateway to all tourist facilities – both adventure and religious in the state. After due public consultation, core old city area of Dehradun was selected for implementing various projects that would have smart elements - improving the life of citizens living in the area in particular and the whole city in general.



The ABD area has been defined in the Smart City Proposal demarcating 875 acres of the iconic old city area and nearby important areas. The sub-projects have been identified and broadly defined in the smart city proposal, which gives a clear glimpse of the projects stated under various heads of the smart city vision covering major aspects for the urgent change and development in the city. A city map of Dehradun also marking the ABD area is shown in Figure 1.1. Water Supply Augmentation & Water meters works are the two among the proposals included in the Mission.

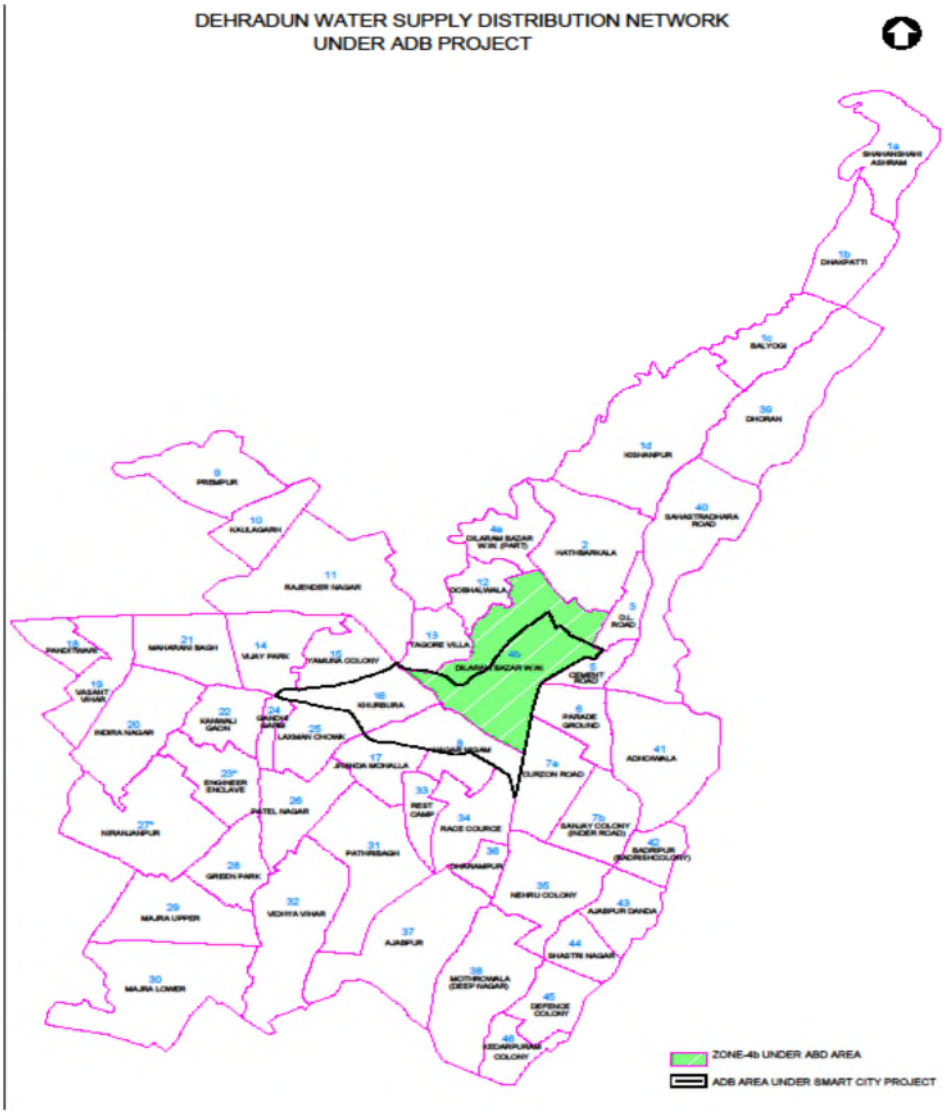
5.1 Scope of work

The scope of the project includes Water Augmentation & Smart Water Metering works is as follows-

5.2 Water Augmentation Works

5.2.1 For zoning, Dehradun municipal area divided Into 46 water supply zones and 5 sub-zones. Isolation of zones was planned and each zone was designed as separate water supply zone, based on area covered by a C.W.R./O.H.T.

5.2.2 Water Supply Reorgnisation works of Distribution System of Water Supply in the area of Zone-4b falling in ABD area of Dehradun Smart City as depicted in the following map-



Zone 4-b

5.2.3 Replacement of combind Rising Main of 3 nos. Nehru Colony Tube wells from Teg Bahadur Road to Survey Chowk.

5.2.4 Rising Mains of two Tube wells in Karanpur area, situated at DAV college and Karanpur respectively, which are at present pumping direct in to distribution system, upto exsiting Over Head Tank at Cement Road

5.2.5 Construction of a T/W, Supply and Installation of Pumping Plant, Automation of Pumping Plant, Transmission line, its Rising Main upto the exsiting Over Head Tank at Tehsil campus and Stablization.

5.2.6 Construction of Boundry wall, Pump House & 3.60 M. wide Iron Gate with pillars.

5.2.7 Operation and Maintinance of works for 5 years.

5.2.8 Any Other work as directed by Engineer in Charge.

5.3 AMR Water Meters

5.3.1 The scope of works under this contract is "Supply, installation, testing and commissioning of AMR Water Meters in Dehradun city including associated ancillary works, as enumerated in the Bill of Quantities provided in Volume-II: Price Bid. The scope further includes reinstating other utilities disrupted during excavation and also providing temporary access, if required. During execution of the zones can be changed and or added.

5.3.2 General Instructions to the Contractor/ Bidder

i. Though the contract provides for supply, installation and commissioning of AMR meters in the size range of 15mm to 100mm. The system also shall include provision to install meters with AMR for the new connections that may come up under the same contract, during the Meter installation period as well as operation and maintenance period.

ii. The Client reserves the right to reject, cancel any or all Tenders without assigning any reasons thereof.

iii. The Bidder is advised to visit and examine the site where the meters and any other equipment, computers, servers etc., to be provided under the contract are to be installed and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for the provision of such equipment and Installation Services. The costs of visiting the site shall be at the Bidder's own expense.

iv. The Bidder and any of its personnel or agents will be granted permission by the DSCL to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the client and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

v. The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the Bid Document. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

vi. The Bidder is requested, as far as possible, to submit any questions in writing, to reach the client not later than one week before the meeting.

vii. Minutes of the pre-bid meeting, including the text of the questions rose without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB.

viii. Non attendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

ix. Provision of future O&M beyond 7 years shall be with the consent of bidder and UJS

5.3.3 Warranties/Guarantees

The effective date of guarantees and warrantees of the particular meter shall be effective only from the date of installation and commissioning of that meter. Free warranty shall be provided till the O&M period of 5 years and the Guaranty shall be provided for 2 years.

5.3.4 Brief Scope of services for the 5 years Technical and spare parts support period:

5.3.4.1 Apart from the 5 years Warranty on the products supplied, following are the mínimum support which the supplier has to provide during the 5 year technical and spare parts support. This shall be for a period of 5 years after completion of the Project completion period as set in the contract. These are included in the list below but not limited to:

5.3.4.2 A Tripartite agreement shall be formed between bidder, DSCL & UJS for the operation and maintenance period of 5 years as DSCL shall be financial agency and UJS shall be for quality monitoring.

5.3.4.3 Provide the necessary after sales support with respect to defects in the products supplied

5.3.4.4 Provide the necessary stock of the spare parts of the meters which includes but not limited to register, spindle, bearings, pressure cap, totalizer, strainers etc during the period of Technical and spare parts support.

5.3.4.5 The bidder need to make all necessary arrangements such that sufficient stock of spare parts and local logistic supports are available at Dehradun so as to ensure smooth operation during this 5 years, technical and Spare parts support period between the bidder, UJS and DSCL.

5.3.4.6 Provide support for fixing or replacement of the spare parts of the metersas and when required.

5.3.4.7 The meter test bench which shall be supplied by the bidder shall be installed in the UJS premises and the same place can be used as a workshop for fixing and replacement of the spare parts.

5.3.4.8 However in case the meter test bench facility is not immediately available during the initial phase of the Technical and Spare parts support period the bidder need to make his own arrangements for premises where he can take up the spare parts fixing and replacement activity.

5.3.4.9 Impart training to the technicians and staff in the meter testing, repair, recalibration of the meters etc. This shall be part of the capacity building exercise which will provide the necessary expertise to the UJS staff to take up such activities independently in future. The training will be provided during the initial phase of the Technical and Spare parts support period to the UJS technicians and staff so as to develop the in-house expertise.

5.3.4.10 Provide clarification in case of any technical issues encountered during this period on the functioning and operations.

5.3.4.11 The bidder shall stand guarantee against all manufacturing defects for the meters for 5 years from the date of installation of a lot of meters. The date of installation for lot of meter shall be the last day of the month for the lot of meters (under one water supply zone defined/as per approved work program by DSCL) installed in that period.

5.3.5 Maintenance:

a) The firm shall stand guarantee against all manufacturing defects for the meters for 5 years from the date of installation of last lot of meters.

b) During the Guarantee period if any meter becomes defective or not found as per specification, the same shall be replaced free of cost by the firm at site failing which it will be repaired / replaced at the risk & cost of the firm.

c) The firm shall prepare and maintain the data base i/c the date of installation, date of defects observed/ pointed out, date of repair/replacement of meter etc. Copy of

Software of the programme will be submitted in consultation with the employer within two months of award of work. It may be integrated with the software referred in technical specifications.

d) If the meter is found tampered with or stolen, the same will not be covered under guarantee of the firm.

e) The firm shall be responsible for maintaining the installed meters during the guarantee period of five (5) years from the date of completion of installation of the supplied meters i/c cost of radio frequency if any required for AMR system. The date of installation of the meters shall be considered as last day of the Third month for the entire lot of meters installed during that quarter.

f) The contractor shall have to appoint Customer Redressal officer with the full fledged team of skilled technicians, tools & mobile van to attend and resolve the customer complaints of urgent nature viz. Leakage from the body of meter & fittings, blockage of strainer of the meter within 48 hours irrespective of any holiday. The firm will provide a help line number for contact and registration of complaints from the consumers.

g) Complaints regarding abnormal readings will also be treated as defective meters unless proved otherwise by conducting field test within consumer premises. The meter shall be tested on complaint & if found defective showing incorrect reading shall be treated as defective meter. The bidder has to arrange for the replacement of such water meters with duly tested meters.

h) If the seal of the water meter is found tampered with, then the verification of the departmental personnel will be obtained on the complaint sheet and cost of such repairs if any or cost of new meter as the case may be, will be charged to the consumer by DSCL. Cost of repairs or cost of new meter shall be paid to the firm immediately after repairs/installation.

i) The firm shall keep sufficient stock of all consumable spares and tested meters during guarantee period and will maintain adequate infrastructure at the Project locations for repairs of water meters supplied under the contract. The firm shall be equipped with all the tools, spares and personnel for carrying out the repairs & replacement. The work force gangs engaged by the firm for the installation / inspection at site shall wear uniform displaying firm's logo & name of personnel. The firm, within three months from date of issue of letter of intent, shall set up its establishments in Project locations for efficient maintenance of supplied meters.

j) The defective meter will be removed and New tested meter would be installed immediately within 3 days after intimation by DSCL/UJS. However, the upper limit should not be more than seven days failing which a penalty of Rs. 10/- per meter per day of delay shall be levied and recovered from the firm. If quantity of defective meters supplied by the firm exceeds 5% of the total quantity supplied at any point of time, the defective meters shall be replaced at site and not repaired. Above penalty is over and above the compensation defined for delay in completing the awarded work within stipulated completion period.

k) The contractor may take defective meters to his work place to rectify the defect for subsequent use.

l) The contractor shall keep a sufficient buffer stock of new meters for the purpose of replacement of out of order / damaged meters. In case the quantity of defective meters requiring replacement is in excess of 5% of the supplied quantity at any stage, then the 20% value of security deposited will be forfeited.

m) If in case the meter is damaged beyond repairs the firm shall first get it verified by UJS before replacing the meter.
n) The firm will be required to submit monthly statement of replacements of meters.
o) The firm shall give the website address which will always carry updated status of the list of defective water meters given by UJS and subsequent action taken by the firm. The website will display the details of the supplied no. of meters in each month, defective meters such as consumer's address, connection number and w/o No, meter-serial no, date of receipt of intimation, date of repairs/replacement etc so as to enable consumers to have related information to their satisfaction. The website information shall be updated on fortnightly basis during the entire guarantee period of five years.
p) Maintenance and repairs of all meters provided and fixed by the agency from the installed meter including cost of all material required for repairs or replacement of meter with all labour required for removing of defective meter and fixing of tested meter and regular maintenance of all meters fixed, checking of strainers, cleaning of dial to keep reading worthy, attending leakages fi-om joints on either side of meter, etc. complete.
q) GPS mapping of installed meters will also be in the scope of bidders for route management and other requirement during maintenance period.
r) During maintenance period, the contractor will get the preventive maintenance done on each meter i.e. dusting, check against leakage etc. on yearly basis.

5.4 Meter Reading (AMR):

a) The successful bidder shall submit a detailed scheme for obtaining and recording remote reading of the AMR water meters to be installed.
b) The scheme of remote reading shall be formulated by forecasting the required nos of hand held units (HHU) & Easy route host, etc, to collect & upload data for the respective region.
c) The meter reading (AMR) scheme shall be formulated keeping, in view the AMR Water meter readings to be obtained by RF based AMR technology, which shall be appropriate for the make & size of the water meters & its software and the output. Format shall be compatible with the System of UJS. The bidder will be responsible to integrate their system with existing system of UJS for printing of bills.
d) The UJS/DSCL reserves the right to accept or reject any / all such AMR water meter reading schemes.
e) It will be mandatory for the successful bidder to provide the demonstration of his remote AMR water meter reading and the bill preparation scheme to the UJS staff & appointed officers as and when required, during the contract period.
f) The system of AMR and HHU shall be maintained in proper working condition for the water meters during the 'post installation' period of five (5) years.
g) The agency will be responsible for taking reading of AMR water meters in monthly billing cycle i/c uploading the reading data in UJS billing unit and integration with existing system for generation/printing of consumer bills by UJS during the contract period i.e. Installation and 5yrs maintenance period thereafter. Distribution of bills will not be in the scope of agency.
h) The reading of AMR meters for generation of bills shall commence within 3 months from the date of installation of each meters.
i) The reading shall be done progressively as the installation work progresses.
j) In case all the AMR meters eligible for the reading, are not read during the billing cycle then no deductions from the due payment will be made so far the number of unread meters do not exceed 0.5 % of the readable meters.

k) A deduction of Rs. 10/- (ten rupees only) per reading in each billing cycle shall be made for the number of readings not collected /taken exceeding 0.5% of the readable meters.

5.5 Guarantee for Trouble Free Performance:

a) The bidder shall give necessary test certificates and also give guarantee for trouble free performance for contract period of months in respect of all water meters i/c AMR system and HHU.

b) The accuracy of the installed water meters will be tested if desired or if disputed and if the test results not found accurate within the acceptable / permissible limit, the bidder will replace the meter free of cost.

5.6 Inspection / Checking of works:

This work is open to inspection and checking by Chief Technical Examiner, Government of India (C.T.E.) whose observations shall be binding on the contractor.

The work is also liable to be inspected and checked by a 3rd party fixed by DSCL and the contractor shall be responsible for removing of all defects / deficiencies at his own cost when pointed out.

The UJS appoint quality inspection agency for ensuring the quality of meters at manufacturing stage. The firm shall extend all facilities required for carrying out the quality checks by the appointed agency. The observations made by UJS or on behalf of UJS shall be binding on the firm. However, the cost /expenditure of the quality assuring agency shall be borne by UJS.

The successful bidder shall keep one no. new SUV diesel operated; model not earlier than 2018model (as decided by engineer in charge) with driver at the disposal of UJS field officials to facilitate inspections during the installation period. All expenditure towards the vehicle i/c running expenses will be borne by the firm.

The inspection by 3rd party /DSCL authority / team shall not absolve the contractor of their own responsibility to detect the defects and rectification thereto. Recoveries, if any, proposed by any of the inspection agency on account of short comings in respect of quality / quantity, if it is within acceptable limit but not reducing soundness and strength of the work, shall be recovered from the contractor's running account payments.

The representatives of the department shall inspect firm's manufacturing unit of the meters to carry out quality checks, the capacity / progress of the awarded supply order.

The Contractor shall inform the Engineer-in-charge in advance for the factory inspection for material and its fabrication.

5.7 Licenses and Permits:

It is the responsibility of the Firm to acquire and maintain all relevant licenses and/or permits for the purpose of implementation of this Contract.

5.8 Indemnity:

The firm undertakes and covenants to indemnify hold the department harmless at all times from any or all claims, demands, requests, fines, penalties and proceedings together with the cost and expenses incidental thereto, of whatever nature, which relate to and/or arise from and/or are in conjunction with the activities and/or undertaking and/or obligation of the firms there under, brought against the department by a third party, including but not limited to the consumers of goods and/or services under this contract, the firm's personnel, its subsidiaries and their personnel, governmental fiscal or local authorities or any branches or subdivisions or authorized representatives thereof

The liabilities of the parties stated hereinabove shall continue to be effective and enforceable after the termination or cancellation or expiration of this Contract, for any cases the grounds thereof and/or incidents giving rise thereto have occurred within the period when the Contract was still valid and in force

The firm undertakes and covenants to indemnify hold the department harmless at all times from any and all claims, demands, requests, fines, penalties and proceedings together with the cost and expenses incidental thereto, of whatever nature, which relate to and/ or arise fi-om and/or are in conjunction with the activities and /or undertakings and/or obligations of the Firm hereunder, brought against the Department by a Third Party, including but not limited to the consumers of Goods and / or Services under this contract, the firm's personnel, its subsidiaries and their personnel, governmental, fiscal or local authorities or any branches or subdivisions or authorized representatives thereof.

5.9 General Scope of work

5.9.1 The contractor is solely responsible for construction work in such a way that the road, structure, civil, aesthetic finishes works shall confirming all technical as well as quality standards as per TENDER DOCUMENT.

5.9.2 The contractor shall promptly inform the PMC/Consultant engaged by DSCL /EIC any error, omission, fault, or any other defect in the design or drawings or specification for the works, which he discovers when reviewing the contract documents, or in the process of execution of the works and collectively resolve the ambiguity or correct the error and will start the execution accordingly.

5.9.3 Verify the Design & Drawing and levels given in the tender document. If any difference in levels is found, the same shall be reported to the EIC immediately.

5.9.4 Planning and taking up the work according to the Methodology/work plan or as per a modified work plan duly agreed and approved by the Engineer in charge.

5.9.5 The excavated areas should be barricaded so as to prevent accidents.

5.9.6 The contractor will be responsible for procuring the all materials as required as per specifications, to maintain their safe custody and for proper construction.

5.9.7 The roads or pathways damaged during construction have to be reinstated to at least original level after completion of the work in that section.

5.9.8 Underground and overhead services are likely to be met with during construction. These are to be protected against damage by the Contractor at his own cost. The contractor work program shall include this activity. The work shall be carried out under supervision of concerned department. The supervision charges of the line agencies shall be paid by the contractor and shall be reimbursed on actual on submission of receipt. however, no claim on account of delay in shifting of utilities by line department will be admissible

5.9.9 The site should be cleaned of all the surplus material and broomed to leave a clean surface at the end of work.

5.9.10 The defect liability period shall be as describe herein this document. No payment for defect repair shall be made in the Defect Liability period.

5.9.11 The site should be cleaned of all the surplus material and boomed to leave a clean surface at the end of work.

5.9.12 The contractor will be fully responsible for structural safety stability work.

5.9.13 Contractor shall take the necessary precaution to avoid the damage to other services such as water supply lines, telephone cables, and electrical cables, storm Water drains etc. In case of any damages to any of the services, Contractor shall be responsible for restoring the facilities in bare minimum time at his own cost.

5.9.14 Work program: It is of utmost importance the work done should be planned in a manner that it is commissioned in minimum time to provide benefits to the citizens inconvenienced.

5.9.15 The contractor may provide his alternative plan of work within 07 days of start for consideration of the EIC who may agree to a changed work program and the same shall be followed.

5.9.16 Knowledge transfer and capacity building of the line department of the DSCL during the O&M period prior to handing over of the site.

5.10 DESCRIPTION OF WORK

5.10.1 About the Distribution System Reorganization:

Area of Zone 4b falling under ABD area of Dehradun Smart City has further been divided into 6 Sub zones (4b – A to 4b –F).

Replacement of these Rising Mains upto Parade Ground OHTs, only in 4.698 km length,

Replacement of Distribution Main of Nagar Nigam OHT:

Replacement of this distribution main from Nagar Nigam OHT to Araghar Chowk, only in 1.44 km length
New Rising Mains of DAV Collage Tube well & KaranpurTubewell upto OHT at Cement Road.

These tube wells supply water to Karanpur Subzone 4b –A, but are directly connected to existing old distribution system, resulting in acute shortage and crisis of drinking water during daily peak demand in Karanpur area which is an important part of ABD area of Dehradun Smart City . Now that distribution system of this Sub zone is being reorganised from the OHT at Cement Road under Smart City Plan, therefore it is essential to take the water of these tubewells to Cement Road OHT and distribute to the Subzone 4b-A from there.

Additional Tubewell for existing OHT at Tehsil Campus

to construct an additional Tubewell and appurtenant works (Pump House, Boundarywall, Gate etc.) at their land available in Tanki - wali-Gali (Dhamawala) and its Rising Main up to the existing OHT at Tehsil campus to improve water supply in Subzone 4b-E and LuniaMohalla, part Paltan Bazar, GhosiGali area etc. which fall in Zone 8 (Nagar Nigam Zone) of ABD area of Dehradun Smart City. After construction of Tubewell Operation & maintenance of tubewell shall be contractor's scope.All staff and labour charges and electricity charges and any other expensive shall be borne by the contractor.

5.11 GENERAL SPECIFICATIONS

5.11.1 General Requirements

The Contractor shall be responsible for establishing and maintain temporary road/drain diversions required for execution of the works. The Contractor shall reinstate all the roads to the satisfaction of the Municipal Corporation representative after completion of works.

5.11.2 Existing Access Roads

The Contractor shall not run tracked or un-sprung vehicles on surfaced roads without the written approval of the DSCL/line Agency Representative who may require that planking or some other protective material be used to protect the road surface.

5.11.3 Clearance of the Site

The Contractor shall clear all the Sites to the extent required by the respective DSCL/line Agency Representative for checking the setting-out.

Clearance of the Site shall also include demolition and removal of all articles, The Contractor 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 Contractor shall remove the material arising from such clearance and dispose of it in a manner at a location, to the approval of the DSCL/line Agency Representative.

The Contractor 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 Contractor shall not clear the Site of any existing structure without the prior written instruction of the DSCL/line Agency Representative.

5.11.4 Clearance and Reinstatement of the Site on Completion

On completion of the Works, the Contractor shall clear any temporary works and temporary access roads and reinstate the areas to their original condition and to the satisfaction of the DSCL/line Agency Representative.

5.11.5 Access for the DSCL/line Agency Representative

The Contractor shall permit the DSCL/line Agency Representative an any person authorized by the DSCL or the Municipal Corporation Representative including workmen of the Municipal Corporation, other contractors 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.

5.11.6 Water Supply and Wastewater Disposal at Site

The Contractor 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.

5.11.7 Electricity for Contractor's Use on Site

The Contractor shall be responsible for provision and distribution of an electrical supply for the purpose of constructing.

The installation shall comply with all the relevant regulations, Indian Standards and Codes of Practice, and Health and Safety requirements, etc. The Contractor 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 Contractor shall be fully responsible for all safety etc.

The Contractor shall test the temporary site distribution system every month for compliance with the relevant standards.

5.11.8 Refuse Disposal on Site

Refuse and rubbish of every kind shall be removed from the Site and disposed off by the Contractor 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 Municipal Corporation Representative.

5.11.9 Detailed design and drawings

DSCL already prepared design and drawing of complete Work any further detailing may be exercised and prepared on the expenses of bidder.

However, all such designs shall confirm to the various standards & codes as under:

1. Bureau of IndianStandards
2. Plain and Reinforce Concrete: Code of Practice IS:456-2008
3. Design Aids for Reinforced ConcreteSP-16
4. Handbook on Concrete Reinforcement and DetailingSP-34

The above list is indicative. Other codes/standards may also be required to be adopted. In such cases, the same shall be adopted upon approved from the Authority (the DSCL)

5.11.10 Earthwork disposal

The excess earth (after filling the structure) from the excavation of structure or roads shall be disposed only at the low lying areas or any other area as per the direction of DSCL/line Agency Representative.

5.11.11 Approval of design mix for RCC:

On approval of the tender, Bidder is required to arrange all for approval of design mix of RCC from any of the Indian Institute of Technology or National Institute of Technology or NABL accreditedLaboratories.

a. The design procedure permissible stresses in material and other relevant stipulations shall be governed by the codes of practice published by BIS and other relevant IS codes.
b. New Codes of Practice and amendments issued by the Bureau of Indian standards till the date of tender will also be automatically applicable for the work, similarly amendments and revisions. Specifications made up to the date of tender shall also be applicable.

5.11.12 Testing of concrete:

All concrete used in the RCC structure shall be mixed in automated batchin plant and vibrated. The Bidder's unit Rate shall include the cost of testing of concrete cubes and other testings related to concrete. Installation of a Calibrated (electrical operated) Testing Machine at site by the Bidder will be acceptable. No manually operated compressive testing machine shall be acceptable .The testing will however, be done under the supervision of the Engineer-in-charge or his authorized representative. The Bidder shall finish attest certificate of the concrete test machine, to be used by him on the site of works sampling, strength test of concrete and acceptance criteria shall be in accordance with IS Codes. Finish of concrete surface: Good surface of the exposed reinforced concrete members must been sured by the Bidder by using plane and true to shape form work. Corrections of defects must be done as desired by the Engineer-in-charge. To lerance in form work shall be in accordance with IS Codes.

Size of Aggregate: Size of aggregate to be used in plain concrete, RCC concrete structure shall be in accordance with specifications. However, for sections of structural components of 300 mm thickness and less only 20mm and down graded aggregate shall beused.

5.12 GUIDELINES FOR SAFE ENTRY AND WORKING IN SEWERS

The Contractor shall strictly follow the safety guideline as mentioned below for safe man entry and working in sewerlines.

5.12.1 SAFE WORK PRACTICE PRINCIPLES

5.12.1.1 Introduction

These general guidelines are intended to assist the Contractor in the development of safe work practices. Where the risk assessment indicates that a particular hazard cannot be present, the precautions to control that hazard do not apply. Remember that a favourable history does not guarantee absence of hazard on this occasion.

5.12.1.2 Confined Space

“Confined space”, in relation to a place of work, means a space of any volume which a person may at any time enter or be allowed to be enter in which the atmosphere is laible at any time to be oxygen deficient. This includes but not limited to pipes, sewers, manholes, tunnels, shafts, ducts, other similar sewerage installations and etc.

The Contractor shall develop acceptable work practices and safe entry procedures based on the guidelines provided here under and the other guidelines including UPJN on safety precautions to be observed during sewer desilting/ lining work included in this specification and implemented on site

5.12.1.3 Notification to Work in Confined Space

The Contractor shall obtain an entry permit from the Engineer for each occupancy of any confined space. The Contractor shall furnish all required details in an approved format to the Engineer for permission to work in confined space at least 24 hours prior to the entry. Where prolonged work is involved, the permit must be renewed for each shift. An incident which substantially alters the condition of a confined space entry requires immediate evacuation and reassessment of the condition.

5.12.1.4 Air Quality and Ventilation

Contaminant control and effective ventilation are major factors influencing air quality in a confined space. The ventilation must be adequate to clear pre-existing contaminated air and maintain a respirable atmosphere during planned work. This ventilation may be permanently installed or portable equipment used for this task. For general ventilation, fresh air should be supplied to the workplace. Within the sewer system this creates an environment which displaces contaminated air in the immediate vicinity.

Where a task generates atmospheric contaminants in a specific area e.g. use of chemical such as polyester resin, adequate local exhaust ventilation should be used to remove the contaminants. Where failure of the mechanical ventilation system would result in deterioration of air quality, the controls must be clearly tagged to prevent accidental interference and the ventilation system monitored while the confined spaceis occupied. Self Rescuers must be carried whenever failure of the ventilation system or changes in the working environment can create a contaminated atmosphere. The self rescuer can be a self contained breathing apparatus, oxygen self rescuer, or short duration self contained breathing apparatus, depending on the time taken to reach openair.

Note: Obtain occupational hygiene advice on the- selection or performance of ventilation system where this is not specified in the work practice or plant design.

5.12.1.5 Lighting

Any regularly accessed confined space should be illuminated with electrical installation to appropriate Indian Standard or equivalent. Portable lighting may be used to supplement permanent lighting in the work place. Temporary mains powered lighting installed for a task must comply with the requirements of appropriate Indian Standard. Miners lamps, mounted on a safety helmet may be used as an alternative to a hand held torch for personal illumination.

The possibility of a flammable atmosphere must be eliminated by isolation, cleaning, ventilation purging etc.

Where the confined space has been proclaimed as a flammable gas hazard area, all fixed and temporary electrical installation must comply with appropriate Indian standard. Torches and portable lights must comply with appropriate Indian standard.

a) Illumination standardsare:-
b) General Lighting:- 40 lux minimum, equivalent to a poorly litroom
c) Stairway lighting:- 80 luxminimum
d) Task Lighting:- 240 lux minimum (normal work shop requirements)

5.12.1.6 Equipment usage, Standards and Maintenance

All confined space safety equipment must meet established standards and be of appropriate design for the proposed usage. The equipment must be checked for visible damage and correct operation before each use. Preventative maintenance must be performed by trained, and where necessary,

authorised persons at the intervals recommended by the equipment manufacturers. The Contractor shall submit to the Engineer evidence of such periodic check and maintenance of the equipment used for confined space entry at every month during the first week of the month. Room to work.

When the constricted volume of a work site prevents normal work postures and tool movement, the need for special tools or frequent work rotation should be considered.

5.12.1.7 Control of Flooding

When a confined space is normally liquid filled, accidental return to service must be prevented by double isolation e.g. insertion of suitable blanking piece, plugging with inflatable plugs, temporary coffer dams as a second isolation in a manhole or other effective means.

5.12.1.8 Flow Control

Where a sewer is entered while flowing, rapid increase in flow must be prevented by use of stop logs. Isolation of pumping stations, weather watch and other means appropriate to the sewer catchment. Adequate communication with the person responsible for flow diversion must be maintained for the duration of the entry.

5.12.1.9 Drowning

Where deep or flowing water is present, use personal flotation devices. Safety harness and life line, safety nets etc. as appropriate to prevent drowning.

5.12.1.10 Fire and Explosion

Adequate precautions must be taken to minimise the risk of fire or explosion when entering a confined space for any purpose.

5.12.1.11 Presence of Flammable Gas

The presence of flammable gas, flammable dust or the possibility of the presence of air borne substances in flammable quantities may create a hazardous Area. Care shall be taken by the authorised person to determine the presence of any such flammable situation in the confined space before entry. Smoking or lighting any cigarette or box matches in confined space shall be strictly prohibited. The flammable gases of concern are methane, digester gas, vapours from flammable liquid, and vapours and gases from trade waste discharges.

5.12.1.12 Manual Handling of Tools etc.

Safe system of work should be followed to protect against fails of persons or objects and crush by moving or falling objects. Extra care is needed if normal manual handling gear is not available or confined space safety gear (Harness, Respirator) isworn.

5.12.1.13 Noise

Reverberation within a confined space can increase noise levels, especially if more than one person is working. Heavy duty hearing protection may be required.

5.12.1.14 Vermin

All persons working in confined spaces should be aware of the health hazards presented by the presence of vermin. The presence of cockroaches etc does NOT indicate that the atmosphere is free of danger to health.

5.12.1.15 Standby and Communication

A member of the confined space work team is allocated the task of maintaining communication with the members inside the confined spaces. This task may be rotated among the members of the team. The Standby person must be trained and be physically capable of providing the assistance and life support in an emergency and must have sufficient proficiency in Marathi, Hindi and English languages to promptly communicate information by radio or telephone when required.

While act in gasst and-by, this person must not enter the confined space or leave the vicinity unless relieved from this duty. A standby person is needed for all confined space entries. The Safe System of Work must indicate the process for communication from the confined space to the standby, e.g. 2 way radios. 'Man down' alarm, line of sightetc.

5.12.1.16 Fitness Assessment

An assessment of fitness, including cardiovascular and respiratory health, is required to ensure that all persons entering confined spaces, or acting as the stand-by person, can comply with the physical demands of the job, without risk to their health.

The contractor shall ensure conducting the medical tests i.e. chest X-Ray, TLC/DLC/Urine and Sputumat regular intervals for the sewer workers engaged on the rehabilitation works and submit its records to DJB.

5.12.1.17 Emergency Rescue and First Aid

No person shall enter any confined space, even in an emergency, without first ensuring all safety requirements have been met. A safety emergency plan may assist in a safe, speedy response in the event of an emergency.

All confined space work teams must be trained and equipped to sustain life and be able to summon emergency help. Provide first aid and assist emergency service personnel, if requested.

Rescue of persons apparently overcome by toxic gases in a sewer or other confined space must only be attempted by trained persons using supplied air breathing apparatus. Stabilisation of other injuries must be prioritised against the availability of breathable air.

5.12.1.18 Cleaning

Where possible, cleaning should be performed without entry to the confined space, even if only preliminary cleaning ispossible.

Particular attention should be given to the probability of releasing hydrogen sulphide when disturbing microbiologically active sludge and sediments which have accumulated in a confined space. Supplied air respiratory protection shall be worn where such residues exist and effective ventilation cannot be guaranteed. Continuous gas monitoring is required even when supplied air respirator protection is used.

Hose couplings should be designed to resist accidental dislodging or loosening. Both the operators and the standby person should be able to stop the flow of cleaning material into the confined space. Hydrojetting must be performed according to the relevant regulations. Where chemical compound isused in with in the confined space, the chemical compound should be classed in the Material Safety Data Sheets as non-irritant to respiratory system, eyes and skin. If this is not possible then appropriate respirator skin and eye protection must be worn. Substance specific air monitoring may be required.

SECTION 5
PART-2
TECHNICAL SPECIFICATION

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5 TECHNICAL SPECIFICATIONS

5.1 CIVIL WORKS

5.1.1 GENERAL SPECIFICATIONS

(i) The work shall be carried out in accordance with the Architectural Drawing, Structural Drawing, all services drawings and approved shop drawings. The Contractor is required to co-ordinate and co-relate all drawings and in case of any differences noticed the contractor shall immediately bring to the notice of the Engineer-in-Charge and shall obtain his final decision before proceeding with the concerned work. In case of any discrepancy in the item description given in the schedule of quantities and the drawings to the relevant items, the former shall prevail unless and otherwise given in writing by the Engineer-in-Charge.

(ii) Wherever any reference is made to any Indian Standard, it shall be inclusive of all amendments issued there to till the date of receipt of the tender.

(iii) Unless otherwise specified in the schedule of quantities, the rates for all items of work shall be considered inclusive of pumping out or bailing out water through out the construction period. This shall include all water encountered due to causes what so ever.

(iv) The work shall be executed and measured in metric dimensions given in the schedule of quantities, drawings, etc., (FPS unit wherever given is for guidance only).

(v) The following additional specification shall apply:

All stone aggregate and stone ballast shall be hard stone variety to obtained from sources and quarries to be got approved from the Engineer-in-Charge.

Coarse sand shall be obtained from sources to be got approved from the Engineer-in-Charge. Whenever required, the coarse sand shall be screened and washed to the satisfaction of the requirement of the specification. Nothing extra shall be payable on this account.

(vi) The rates for all items, unless clearly otherwise specified shall include all inputs of materials, labour, T & P, taxes, duties, scaffolding, wastages, watch & wards and all other incidental charges.

(vii) The masonry work for the position of the external wall of WC, through which pipes are taken, shall be done after the pipes are fixed as far as possible. All cutting of masonry, concrete and finishing shall be avoided. In case it is necessary for taking any services, the same area shall be made good during finishing without any extra payment.

5.1.2 Delivery, Storage And Handling Of Chemicals

(i) All the chemicals (Anti- termite, Epoxy, Polymer, Water Proofing Compound, Plasticizers, etc.) shall be procured in convenient packing in sealed containers and to be stored in a condition as recommended by the manufacturer.

(ii) All such material shall be got approved and documents deposited with the Engineer-in-Charge. However, the material shall be in the custody of the contractor. Day-to-day account of receipt, issue and

balance shall be regulated by the Contractor and proper account shall be maintained at site of work in the prescribed from and shall be submitted to the Engineer-in-Charge. The original copies of challan/cash memos towards the quantity of various chemical procured shall be made available to the Engineer-in-Charge on demand and a copy deposited.

(iii) Empty container should not be removed from site till the completion of the project and without the written permission of the Engineer-in-Charge.

(iv) Contractor shall suitably advice his Engineer to follow all safety norms pertaining to handling/storage and application of chemicals. Necessary protective and safety equipments, hand gloves, goggles, etc. shall be provided to all the concerned worker/ staff.

(v) All chemicals shall be tested from an independent laboratory, if required, as approved by the Engineer-in-Charge.

5.1.3 Stone Work

5.1.3.1 The Engineer-in-Charge or his representative may, if required, visit to site / source of stone to assess the quality and availability of the required quantity of stone. The contractor shall bear the cost of such visit.

5.1.3.2 For measurement of flooring in curved profile, only area actually contained in the flooring shall be measured for payment. Nothing extra shall be paid against wastage, extra labour or any other incidental.

5.1.3.3 For skirting in curvilinear profile, the stones / tiles are to be cut in sizes and shape as shown in Architectural drawing. Similarly, the skirting shall be fixed / embedded in a manner so as to flush / project from the wall as shown in drawing and as directed by the Engineer-in-Charge. Any chasing, etc. required for such fixing is deemed to be included in the cost of skirting / masonry and nothing extra shall be paid on this account.

5.1.4 Environment Protection

The following provisions shall be maintained by the contractor at site and no separate payment shall be made on these accounts unless otherwise provided for in the BOQ

a. Provide sufficient level of sanitation / safety facilities for construction workers to ensure the health and safety of the workers during construction, with effective provisions for the basic facilities such as sanitation, drinking water and safety equipments or machinery.

b. Identify roads on-site that would be used for vehicular traffic. Strengthen vehicular roads (if these are unpaved) by increasing the surface strength. This can be achieved by improving particle size, shape and mineral type that make up the surface base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10-20%. Limit vehicular speed on site 10km/h.

c. Ensure that water spraying is carried out by wetting the surface by spraying water on.

(i) Any dusty material.
(ii) Areas where demolition work is carried out.
(iii) Any unpaved main-haul road and
(iv) Areas where excavation or earth moving activities are to be carried out.

d. Cover and enclose the site by

(i) Providing dust screen, sheeting or netting to scaffold along the perimeter of a building.
(ii) Covering stockpiles of dusty material with impervious sheeting.
(iii) Covering dusty load on vehicles by impervious sheeting before they leave the site and.
(iv) Transferring, handling/storing dry loose materials like bulk cement and dry pulverized fly ash inside a totally enclosed system.

e. Adopt measures to prevent air pollution in the vicinity of the site due to construction activities. There is no standard reference for this. The best practices should be followed (as adopted from international best practice documents and codes).

f. The contractor will undertake the responsibility to prevent air pollution (dust and smoke), ensure that there will be adequate water supply/storage for dust suppression, devise and arrange methods of working and carrying out the work in such a manner so as to minimize the impact of dust on the surrounding environment and provide experienced personnel with suitable training to ensure that these methods are implemented. Prior to the commencement of any work, the method of working, plant equipment and air pollution control system to be used on-site should be made available for the inspection and approval of the Engineer-in-Charge to ensure that these are suitable for the project.

g. All dangerous parts of machinery are well guarded and all precautions for working on machinery are taken. Maintain hoists and lifts, lifting machines, chains, ropes and other lifting tackles in good condition.

h. Use of durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.

Ensure that walking surfaces or boards at height are of sound construction and are provided with safety rails and belts. Provide protective equipments such as helmets.

Provide measure to prevent fire. Fire extinguisher and buckets of sand to be provided in fire-prone area and elsewhere.

i. Provide sufficient and suitable light for working during night.

Ensure that measures to protect workers from materials of construction, transportation, storage and other dangers and health hazards are taken.

Ensure that the construction firm / division / company had sound safety policies.

Comply with the safety procedure, norms and guidelines (as applicable) as outlined in NBC 2005 (BIS 2005c).

Adopt additional best particles and prescribed norms as in NBC 2005 (BIS 2005).

Provide clean drinking water to all workers. Provide adequate number of decentralized latrines and urinals to construction workers.

j. Ensure that the vegetation is cleared only from the areas where work will start right away or area to be disturbed due to any sort of construction activity like for vehicular movement, stacking of materials, labour hutments, carpenter or steel workshops etc. Vegetate / mulch areas where vehicles do not ply. Apply gravel / landscaping rock to the areas where mulching / paving is impractical.

k. Employ measures to segregate the waste on-site into inert, chemical or hazardous wastes. Recycle the unused chemical / hazardous wastes such as oil, paint, batteries and asbestos. The inert waste is to be disposed off to Municipal Corporation / local bodies dump yard and landfill sites.

5.1.5 Preserve and protect landscape during construction.

Following provisions shall be made at site by the contractor to preserve and protect landscape. Nothing shall be paid on this account unless specifically provided for in the BOQ.

5.1.5.1 To preserve the existing landscape and protect it from degradation during the process of construction select proper timing for construction activity to minimize the disturbance such as soil pollution due to spilling of the construction material and it's mixing with rainwater. The construction management plan including soil erosion control management plan shall be prepared accordingly for each month and get approved from the Engineer-in-Charge. The application of erosion control measures includes construction of gravel pits and tire washing bays of approved size and specification for all vehicular site entry/ exists, protection of slopes greater than 10%. Sedimentation Collection System and run-off diversion systems shall be in place before the commencement of construction activity. Preserve and protect the existing vegetation by not-disturbing or damaging to specified site areas during construction. The trees that are identified to be retained on site are protected during the construction period using the following measures:

(i) The damage to roots is prevented during trenching, placing backfill, driving or parking heavy equipments. The dumping of trash, oil, paint and other material is detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the trees.

(ii) The trees are not used for support their trunks should not be damaged by cutting and carving by nailing posters and advertisements or in any other way.

(iii) The lighting of fires or carrying out heat or gas emitting construction activity within the ground covered by canopy of the trees is not permitted.

(iv) The young trees of saplings identified for preservation within the construction site must be protected using tree guards of approved specification.

(v) The grades of soil should be maintained around existing vegetation. Lowering or raising the levels around the vegetation should not be allowed unless specifically directed by the Architect/Engineer –in – Charge.

(vi) Maintenance activities should be performed, as and when needed, to ensure that vegetation remain healthy.

5.1.5.2 Staging is dividing a construction area into two or more sections to minimize the area of soil that will be exposed at any given time. Staging should be done to separate undisturbed land from land disturbed by construction activity and material storage. Measures should be followed for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels and perimeter dike/swale should be constructed to carry the pollutant laden water directly to the treatment device or facility (municipal sewer line). The plan should indicate how the above was accomplished on site well in advance of the commencement of the construction activity.

5.1.5.3 Spill prevention and control plans should clearly state measures to stop the source of the spill. Measures to be taken to contain the spill and to dispose the contaminated material and hazardous wastes in approved manner. It should also state the designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners and petroleum products.

5.1.5.4 A soil erosion and sedimentation control plan should be prepared by the contractor and shall be got approved from the Architect / Engineer prior to construction and should be applied effectively. Measures for prevention of top soil are given below:

(i) Top Soil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas and external services. It should be stockpiled to a maximum height of 40 cm in designated areas and reapplied during plantation of the proposed vegetation. The top soil should be separated from the sub soil debris and stones larger than 50 mm in diameter. The stored top soil may be used as finished grade for planting areas post construction or cordoned off undisturbed areas on site. Stockpiled top soil should not be compacted to help process of aeration. It should be stabilized on the top by temporary seeding or plastic sheets to avoid wind and water erosion.

(ii) Sedimentation basin, a temporary dam or basin at the lowest convenient point of the site should be constructed for collecting, trapping and storing sediment produced by the construction activities. A flow detention facility must also be constructed for reducing peak run-off rates. This would also allow most of the sediments to settle before the run-off is directed towards the outfall.

(iii) Contour trenching is to be provided which an earth embankment or ridge-and-channel arrangement constructed parallel to the contours, along the face of the slope, at regular intervals on the lengths and slopes greater than 10% (1:10). They are used for reducing run-off velocity, increasing the distance of overland run-off flow. They are also used to hold moisture and minimize sediment loading of surface run-off.

5.1.5.5 Compensate the loss of vegetation (trees) due to the construction activity by compensatory plantation. Replant same native and/or non-invasive species, which existed on the site before elimination, in the proportion of 1:3.

5.1.6 EARTH WORK

i. Earth work in excavation shall generally be as per CPWD specification.

ii. The rate for earth work shall include work in or under water / foul position, liquid mud, water, etc. Wherever required the contractor shall carry out close / open timbering, including strutting, shoring and packing, etc. The rates also shall be inclusive of work at any lifts, depths, heights and leads within the site. Nothing extra shall be paid on the above accounts.

iii. Dewatering, if required shall be carried out conforming to BIS code IS:9759 or as per the specification approved by the Engineer-in-Charge. Suitable stand by arrangement is to be kept to cater for repair/maintenance of pumps and disruption of power/fuel supply. The water/slush/mud etc. shall be disposed off as per the procedure and approval of the local bodies. All permission on this regard is to be taken from local authorities by the contractor and no extra shall be paid on this account.

5.1.7 CEMENT

i) Unless otherwise specified or called for by the contract, cement shall be Pozzolonic Portland Cement of 43 grade (IS : 8112) in 50 kg. bags. The use of bulk cement will be permitted only with the approval of the Engineer-in-Charge. Changing of brands or type of cement within the same structure shall not be permitted unless otherwise necessitated and approved by the Engineer-in-Charge.

ii) Contractor will have to make his own arrangement of storage of adequate quantity of cement. Storage, handling, etc., of cement shall be as specified in CPWD specification.

iii) Conformity of cement to IS specification is to be produced from the manufacturer by the contractor to the Engineer-in-Charge including manufacturer's test certificate. Should anytime, the Engineer-in-Charge has reason to consider that any cement is defective, then irrespective of it's origin and or manufacturer's test certificate, such cement shall be tested immediately at a national / approved test laboratory and unless the results of such tests are found to be satisfactory, it shall not be used in the work. In case of such additional tests, the cost shall be born by the contractor.

iv) Cement brought to site and cement remaining unused at the completion of the work shall not be removed from site without the written approval of Engineer-in-Charge.

v) The record of cement received at the store, issued to site of work and consumption of cement shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 42 of the contract.

5.1.8 STEEL

5.1.8.1 Contractor shall procure reinforcement bars (Fe 415 / Fe 500 / Fe 550) conforming to CPWD / BIS code. Manufacturer's test certificate with respect to all steel brought to site as well as independent laboratory testing for samples as per BIS codes shall be provided to the Engineer-in-Charge. In case of non-conformity, the same shall be rejected and removed from the site by the contractor within one week of rejection.

5.1.8.2 For checking nominal mass, tensile strength, yield stress, bend test, re-bend test, etc., specimen of sufficient length shall be cut at random at frequency as specified in the relevant IS code.

5.1.8.3 The cost of sample and the charges for testing shall be born by the contractor. In case additional tests are required by the Engineer-in-Charge, if it appears to be not up to the requirement, additional tests may be ordered by the Engineer-in-Charge. In such case, the cost of samples shall be born by the

contractor and the charges for the testing shall be born by the contractor / department in the manner indicated below:

i) By the Contractor, if the results show that the steel does not conform to the specification.

ii) By the Department, if the results show that the steel conforms to the specification.

5.1.8.4 The records of steel received at the store, issued to site of work, and consumption shall be regulated and proper accounts maintained as provided in contract clause 10 of the contract. The theoretical consumption shall be worked out as per the procedure laid down in clause 42 of the contract.

5.1.9 CONCRETE AND RCC WORKS

The work in general shall be carried out as per the CPWD specifications.

5.1.10 CONCRETE:

All the concrete for the construction of cast- in- situ RCC works and specified plain cement concrete works shall be procured from a Ready Mix Concrete Suppliers (plants) approved by the Engineer – in – Charge. Site batching plant produced concrete shall also be permitted on approval by the Engineer-in-Charge. The mix design and other parameters of the RMC including transporting and placing etc. shall be strictly as per the **LATEST CPWD SPECIFICATIONS FOR CEMENT MORTAR, CEMENT CONCRETE AND RCC WORKS**, unless specified otherwise and shall be informed to the RMC supplier by the Contractor .The Contractor shall be wholly responsible for ensuring the property of concrete, as required at site, irrespective of the fact that the RMC plant/supplier /batching plant shall be approved by the Engineer-in-charge. Engineer-in-charge or his representatives shall be at liberty to inspect the operations, quality of various ingredient materials and take samples, if required, verify quantity of various ingredients being used at the RMC plant /batching plant and take samples of concrete at the RMC plant/batching plant and also at site, as desired. The Contractor shall satisfy himself that the quality of materials including various ingredients is as per the specifications. In case the aggregates tested do not comply with any requirement of specifications, the source for the same shall be rejected. The aggregates shall be stored in such a way as to prevent mixing with foreign material as well intermixing amongst them. Different sizes of coarse aggregate shall be stored in separate compartment to prevent intermixing at the partition.

5.1.11 BATCHING OF CONCRETE

5.1.11.1Various ingredients of the cement concrete and Reinforced Cement Concrete shall be mixed by weigh batching only. The measuring equipments shall be maintained in clean and serviceable condition. The calibration certificate shall be made available from RMC supplier approved agency and calibration shall be subject to third party check also, as directed and decided by the Engineer-in-charge and this shall be mandatory and binding on the Contractor and his RMC supplier. The weigh batching shall be done by converting the proportion of ingredients into their masses considering their specific gravity, density, voids, absorption, bulking etc. The decision of Engineer –in- Charge in this regard shall be final and binding. The various grade of concrete to be procured from RMC supplier shall be as specified in item and as directed by the Engineer-in-charge.

5.1.11.2The Contractor has to procure the concrete from a Ready mix concrete plant / or site Batching plant having the computerized weigh batching conforming to IS: 4925 with arrangement for automatic dosing of admixture and adequate production capacity. The minimum cement content in concrete shall be as specified in the relevant IS code. The target mean strength shall be as per CPWD specification. Suitable adjustments shall be available for allowing variation in respects of quantity of aggregates /

water to allow for variations due to surface moisture in the aggregates. Fly ash shall not be used in RCC. All the items of work involving cement shall be carried out using PPC 43 grade cement.

5.1.12 WATER CEMENT RATIO AND WORKABILITY

5.1.12.1The quantity of water added to cement, sand and aggregates during mixing, including moisture contents of the aggregates, shall not exceed 0.45 water cement ratio. Reference may be made to CPWD Specifications for guidance with respect to workability. The concrete mix shall be suitably designed for the required slump, if required, by using appropriate admixture to limit the maximum water cement ratio.

5.1.13 CONCRETE TESTING:

5.1.13.1Samples from fresh concrete shall be taken as per IS: 1199. Random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested. At least one sample shall be taken from each shift of work. Samples of concrete for each batch shall have to be taken by the RMC supplier also and tested after 28 days and results submitted to the department for record. Procedure of testing, its acceptance criteria etc. shall be regulated in accordance with the CPWD Specifications.

5.1.14 TRANSPORTING:

5.1.14.1The period between mixing of concrete and placing it in final position shall be kept to a minimum and the delivery of concrete shall be coordinated with the rate of placement, to avoid delays in delivery and placement. The concrete shall be supplied / transported through transit mixers and general construction of transit mixer and other requirements shall conform to IS: 5892.

5.1.14.2Concrete shall be handled from the place of mixing to the place of final deposit by methods, which prevent segregation, or loss of any ingredients and contamination.

5.1.14.3Where concrete is conveyed by chutes, the chutes shall be made of metal or fitted with metal lining. The approval of the Engineer-in-Charge shall be obtained for the use of chutes in excess of 3 metres long and in such cases the concrete shall be remixed if so required by the Engineer-in-Charge or closed bottom buckets shall be used. If concrete is placed by pumping, the conduit shall be primed properly. Once pumping is started, it shall not be interrupted as far as possible. Concrete shall not be dropped in to place from a height more than 1.5m.

5.1.15 PLACING:

a) Concreting of any portion of the work shall be done in presence of the representative of the Engineer-in-Charge and shall be done only after approval of the Engineer-in-charge.

b) Concrete can be laid using born pumps, buckets, cranes, trolleys etc. as required as per the site conditions. However, nothing extra shall be payable on accounts of using any particular method of laying concrete.

c) Concreting shall be carried out continuously between construction joints shown on the drawings or as agreed by the Engineer-in-Charge. The Contractor shall closely follow the sequence of concreting where it is specified in the drawings. If concreting is interrupted before reaching the predetermined joint an approved construction joint shall be provided. Construction joints shall be minimized as far as possible. These shall be set at right angles to the general direction of the member .The surface film of the first placed concrete should preferably be removed while the concrete is still green to expose the aggregate and leave a sound irregular surface. However care shall be taken not to disturb the concrete already laid.

d) Concrete shall be deposited as nearby as practicable in its position to avoid re-handling and shall not be dumped in a large quantity at any point.

e) All care shall be taken to prevent honey combed concrete or bleeding or segregation of concrete.

5.1.16 CHEMICAL ADMIXTURES AND ADDITIVES

a) Chemical admixtures shall not be used unless permitted by the Engineer-in-charge. However, admixtures procured from the manufacturers and of brand as approved by the Engineer-in-charge may be allowed on specific request of the Contractor for imparting special characteristics to the concrete. Only those admixtures which conform to IS: 6925 and IS: 9103 shall be allowed to be used, for restricting water cement ratio to 0.45 and at the same time obtaining specified slump value as per CPWD Specifications. The admixtures shall not in any way adversely affect the durability of the concrete and the reinforcement. Admixtures generating hydrogen and nitrogen etc. shall not be allowed to be used. Slump required shall be as per the CPWD specification and as per the method of placement adopted by the contractor. However the water cement ratio for all concrete shall not be more than 0.45. Nothing extra shall be payable an account of any admixture required for achieving certain slump or for the method of placement like with born pump, bucket with crane etc. However the concrete and admixtures shall satisfy the other parameter as specialized in the tender.

5.1.17 CONSTRUCTION JOINTS

a. Construction joints in PCC, RCC and Light Weight Concrete works etc., shall be provided only at places as per approved structural drawings. It shall not in any manner structurally or functionally affect the structure. If, any additional construction joint is required to be provided, it shall be done with approval of the Engineer-in-Charge.

b. The centering, shuttering, strutting etc., required for the construction joint in PCC, RCC and Light Weight Concrete works shall be provided as per the CPWD Specifications. Nothing extra shall be payable on this account.

5.1.18 TREATMENT TO THE CONSTRUCTION JOINTS AND RECTIFICATION OF DEFECTS.

a. All care shall be taken to minimize the number of construction joints in the work. Still, wherever the construction joints are provided, these shall be slightly opened up and then suitably filled with cement mortar 1:3 (1 cement: 3 fine sand) after applying a bond coat of cement slurry. The aluminium nipples shall be fixed in the cavity and crevices, if required. Then cement slurry of w/c ratio 0.5 shall be pressure grouted through these nipples as required, which shall then be suitably cut. Nothing extra shall be payable on this account.

b. All care shall be taken to avoid any honey combed concrete or any cavity. Still, if any honey combed concrete or cavity in RCC wall is encountered the same shall be rectified by removing all loose concrete by chiseling. The chipped concrete surface shall be cleaned and made dust free by blowing compressed air and then washed clean with water (but without excess water). Then a bond coat of polymer modified cement slurry @ 2.2 kg of cement per sq. m. of concrete surface, in two coats, shall be applied as specified. The second coat shall be applied immediately within 15-20 minutes of application of the first coat. A coat of polymer modified cement plaster of mix 1:3 (1cement: 3 fine sand) of the required thickness shall be applied as specified to fill the cavity if the required thickness is less than 20 mm. If the required thickness is more than 20 mm. the cavity shall be filled by concrete of relevant grade after providing the required centering and shuttering. The surface shall then be moist cured for minimum 7 days. Nothing extra shall be payable on this account.

5.1.19 MISCELLANEOUS

a. Only round type concrete cover blocks of same mix shall be used. No other type of cover blocks shall be permitted.

b. Any cement slurry if added over base surface (or for continuation of concreting) for bond, its cost shall be deemed to have been included in the respective items, unless otherwise, explicitly stated and nothing extra shall be payable nor extra cement considered in the cement consumption on this account.

c. Centering and shuttering for all concrete and reinforced concrete wherever required shall be in steel and / or plywood to produce a smooth and uniform finish on all exposed surfaces. However, all props, bracings, scaffolding etc., shall be in steel. The entire responsibility of planning, design, erection and safety of formwork shall lie with the Contractor.

d. It is clarified that only the portion of shuttering in elevation (and not segmental) shall be measured for payment. The shuttering curved in plan shall not be measured separately for payment and its rate is deemed to be included in the cost of respective item for payment and measurement shall be as per the CPWD specifications. For shuttering curved in elevation the steel / ply shuttering shall be fabricated to achieve the curved profile as per the architectural drawings.

e. The drop facia and fins with out support at bottom shall be measured from below or over the RCC slab/ beams. The same above the top or RCC slab/ beam shall be measured under wall.

f. The crushed stone/ crushed gravel sand shall not be permitted to be used in work. In exceptional circumstance if it is required to be used, it shall be permitted only with the written approval o f the Engineer.

5.2 Structural Steel Work

Structural steel work shall generally as per CPWD Specification

5.2.1 Scope of Work

The work covered by this specification consists of supplying, fabricating and erecting structural steel complete in strict accordance with this specification and the applicable drawings.

i. **Shop Drawings**

The shop drawings of structural steel based on construction drawings shall be prepared by the contractor submitted to the Engineer in charge. The necessary information for fabrication, erection, painting of structure etc. must be furnished immediately after acceptance of the tender.

ii. **Painting**

Painting should be strictly according to I.S. 1477 (Part l - Pretreatment) and I.S. 1477 (Part II - Painting).

Painting should be carried out on dry surfaces free from dust, scale etc. The paint shall be approval by the Engineer.

One coat of shop paint (Zinc Chromate) shall be applied on steel except where it is to be encased in concrete or where surfaces are to be field welded.

5.2.2 STAINLESS STEEL WORKS

i. **Stainless Steel Frame Work and Hand Rail**

Providing, fabricating and fixing in position welded built up section of Grade 316 and of required sections using stainless steel pipes, plates, flats, etc., as shown on drawing, description and as directed by the Engineer-in-Charge. The work shall also include cutting, welding, grinding, bending to required shape and profile, hoisting, buffing and polishing, cutting chase, embedding in masonry / concrete, rigidly fixed etc. all complete at all floors and levels. All railings shall be measured in running meter for a particular type of complete railing.

ii. **Testing of Material**

The stainless steel sections shall be tested in an independent laboratory as approved by the Engineer-in-Charge. One sample of each type of stainless section shall be tested for SS grade. This sample shall be selected randomly from site or factory / workshop. If the sample fails the tests, the material shall be rejected and removed from site by the contractor and replace with satisfactory material at his on cost. One sample for each lot shall be tested. The cost of testing and sample shall be born by the contractor.

iii. Stainless steel jali for door and window shall be made from SS grade 304. The gauge of jali shall be 14/26, and unit weight shall not be less than 0.087 kg/sqft.

5.2.3 PARTICULAR SPECIFICATION FOR FLOORING WORK

i. Granite/Paver/Grass Paver Work

This section shall cover marble, granite and marble/granite veneering to walls, flooring and counter top work as detailed below.

ii. Material

Marble/Granite shall be hard, sound, dense and homogeneous in texture in accordance to the sample & of the required size and thickness approved by the Engineer. It shall be reasonably uniform in colour, texture, pattern & shape and free from stains, cracks, decay and weathering and of specified quality, size and thickness. The slabs shall be pre-polished or matte flamed finished as specified in the factory before delivery. Before placing order a samples of the flooring shall be installed at the site and got approved. The granite slabs in external and internal wall veneer work shall be mirror polished in the factory with Silicon Carbide abrasives starting from no. "00" upto no. 5 and then using buff/lead strip rolls with tin oxide for final mirror polish. For flooring and counter top the final tin oxide polish shall not be used.

iii. Specialist Sub-Contractor

The supply & installation of the granite work shall be carried out by the approved renowned specialist agency experienced in the trade. The Specialist agency will be approved by the Engineer / Architect after executing necessary samples of relevant veneering, cladding and flooring works. The work will commence only after approval of relevant shop drawings for Marble / Granite.

5.2.4 Marble/Granite Veneering Work (Wet Fixing)

a. Preparation

Every stone shall be cut to the required size and shape, so as to be free from any waviness and to give truly vertical and horizontal joints. In exposed masonry, the faces that are to remain exposed in the final position and the adjoining faces to a depth of 6 mm shall be fine chisel dressed in both directions or polished as required to a depth of 6 mm so that when checked with a 60 cm straight edge no point varies from it by more than 1 mm. for veneering work. No dressing or polishing shall be done at the back of the stone, so as to ensure better grip with the backing. The dressed slabs shall be of the thickness, as specified with permissible tolerance of (±) 2 mm.

b. Fixing with Mortar

Mortar for fixing shall be as specified in the description of the particular item and as per the specification of mortar mentioned in CPWD Vol. – II (specification).

c. Laying with Mortar

The stone shall be wetted before laying. Before installing the stone slabs the backing shall be plastered, cured and all surfaces imperfections removed. Pre-polished stone of the required size shall then be installed in position. The adjoining slabs shall be secured to each other and to the backing by means of stainless steel cramps, pins & dowels and araldite. The material for cramps shall have high resistance to corrosion under condition of dampness and against the chemical action of mortar or concrete in which cramps are usually embedded.

All the joints shall be full of mortar. Special care shall be taken to see that grounding for veneer works are full of mortar. If any hollow groundings are detected by tapping the face stones, these shall be taken out and re-laid. The thickness of the face joints shall be uniform, straight and as fine as possible and pointed with mortar as specified.

The veneering shall be carried in truly plumb. All courses shall be laid truly horizontal and all vertical joints truly vertical.

d. Protection

The work shall also be suitably protected from damage, mortar dropping and all other extraneous materials and rain during construction. Double scaffolding having two sets of vertical supports shall be provided wherever necessary and shall be sound and strong.

5.2.5 Marble/Granite Flooring and Counter Top

i.Dressing of Slabs

Every stone shall be prepolished and accurately machine cut to the required size and shape so that a straight edge laid along the side of the stone is fully in contact with it. For patterned flooring actual dimensions shall be taken at the site and shop drawings in suitable scale prepared to identify correctly the sizes and shapes of all stones. Each stone shall be marked with a suitable identification number. All angles and

edges of the granite slabs shall be true, square or angular as required and free from chippings and the surface shall be true and plane.

The thickness of the slabs shall be shown in the drawing with allowable tolerance of ± 2 mm. In respect of length and breadth of slabs a tolerance of ± 5 mm will be allowed.

ii. Laying

Sub-grade concrete or the R.C.C. slab on which the slabs are to be laid shall be cleaned, wetted and mopped. For patterned work the stone shall first be laid in position loose to ensure achievement of the required pattern and any adjustments required shall be made and all stone shall be wetted and washed just before placing and the bedding for the slabs shall be with mortar as described in the item.

The average thickness of the bedding mortar under the slab shall be to suite the overall thickness of flooring specified and the thickness at any place under the slab shall not be less than 12 mm.

Mortar of the specified mix shall be spread under the area of each slab, roughly to the average thickness specified in the item. The prepolished slabs shall first be laid on top of the mortar in accordance with the approved drawing and pressed tapped with wooden mallet and brought to proper level in continuity with the adjoining slabs. It shall be lifted and laid aside. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows. The mortar shall be allowed to stiffen slightly & uniformly and cement slurry of honey like consistency shall be spread over the same at the rate of 4.4 kg of cement per sqm. The edges of the slab already paved shall be buttered with grey or white cement with or without admixture of pigment to match the shade of the slabs as given in the description of the item. The slab to be paved shall then be lowered gently back in position and tapped with wooden mallet till it is properly bedded in level and line with as fine a joint as possible. Subsequent slabs shall be laid in the same manner. After each slab has been laid, surplus cement on the surface of the slabs shall be cleaned off. The flooring shall be cured for a minimum period of seven days.

The surface of the flooring as laid shall be true to falls and, slopes as required. The slabs shall be matched as shown in drawing or as instructed by the Engineer.

Slabs which are fixed in the floor adjoining the wall shall enter not less than 12mm under the plaster /skirting or dado. The junction between wall plaster and floor shall be finished neatly and without waviness. Wherever required the flooring shall be laid in patterns and/or with brass divider strips as required.

iii.Curing and Finishing

The day after the slabs are laid all joints shall be cleaned of the cement grout with a wire brush or trowel to a depth of 5mm and all dust and loose mortar removed and cleaned. Joints shall then be grouted with white cement mixed with or without pigment to match the shade of the topping of the wearing layer of the slabs. The Plaster of Paris slurry shall be applied to the entire surface of the slabs in a thin coat to protect the surface from abrasive damage.

Before handing over the area, the protective cover shall be removed carefully and the surfaces cleaned and carefully rubbed with a "namdah" block to leave a clean & shining floor without any defects to the

satisfaction of the Engineer. If any slab is disturbed or damaged, it shall be refitted or replaced and properly jointed. The finished floor shall not sound hollow when tapped with a wooden mallet.

Backing mortar for marble flooring / veneering shall be of white cement and quartz sand mortar in ratio as specified.

5.3 WATER SUPPLY WORKS

5.4 DUCTILE IRON PIPES, SPECIALS AND LAYING OF PIPES FOR WATER SUPPLY

5.4.1 General

5.4.2 Standards

Except as otherwise specified in this technical specification, the Indian/International Standards and Codes of Practice in their latest version shall be adhered to for the design, manufacturing, inspection, factory testing, packing, handling and transportation of product. Should any product be offered conforming to other standards, the equipment or products shall be equal to or superior to those specified and the documentary confirmation shall be submitted for the prior approval of the Engineer-In-Charge.

5.4.3 Specifications

This specification requires a reference to the following standard Specifications: 8329 Submersible cast (spun) ductile iron pressure pipes and GI(M) pipes for water, gas and sewage.

IS: 9523 Specification for DI fittings for pressure pipes for water, gas, and sewage.
BS: 4772 Specification for DI fittings
IS: 5382 Specification for Rubber Gasket for push in joints for pipes.
IS: 12820 Dimensional requirements for rubber gaskets for mechanical joints and push on joint for use with cast iron/ D.l. pies and fittings for carrying water, gas and sewage.
IS: 12288 Code of practice for use and laying of ductile iron pipes
IS: 1363 Hexagon head bolts, screws and nuts of product grade A and B(part: 1-5)
IS: 3624 Pressure and vacuum gauges
IS: 341 Black japan, types A, Band C
IS: 9862 Ready mixed paint, brushing, bituminous, black, lead free, acid, alkali, water and chlorine resisting
IS: 1239 Specification for Steel Tubes, Tubulars and other wrought steel fitting

5.4.4 Ductile Iron Pipe

Ductile Iron Pipes:

The pipes will be centrifugally cast (spun) Ductile Iron pipes for Water and Sewage confirming to the IS 8329: 2000. The pipes used will be either with push on joints (Rubber Gasket Joints) or Flanged joints. The class of pipe to be used shall be of the class K-9.

The pipes shall be outside coated with zinc with a finishing layer of bituminous paint as per appendix A and have factory provided cement mortar lining in the inside as per the provisions of Appendix B of the IS 8329: 2000.

The pipes will be supplied in standard length of 3.00,4.00, 5.00, 5.50, 6.00 meters and assorted lengths with suitably rounded or Chamfered ends. Each pipe of the push on joint variety will also be supplied with a rubber EPDM gasket. Any change in the stipulated lengths will be approved by the Engineer-In-Charge. The gaskets will confirm to the IS 5382:1985.

The gasket should also be supplied by the manufacture of the pipes, They should preferably be manufactured by the manufacturer of the pipes. In case they are not, it will be the responsibility of the manufacturer of the pipes to have them manufactured from a suitable manufacturer under it's own supervision and have it tested at his/sub contractors premises as per the contract. The pipe manufacturer will however be responsible for the compatibility and quality of the products.

The flanged joints will confirm to the Clause 6.2 of IS 8329. The pipe supply will also include one rubber gaskets for each flange.

GI pipes:

Providing and supplying medium duty GI pipes in standard lengths as per specified diameter, ISI mark , with required coupling, suitable for potable water including all local and central taxes, transportation, freight charges, inspection charges, loading, unloading, conveyance to the site stacking including cost of jointing material i.e. solvent cement, etc. complete.
Lowering & laying in position to correct line & level M.S. Pipe of specified diameter with required specials/fitting including conveyance from store to site of work loading, unloading, joint plastering, hydro testing etc. complete as IS 1239

Inspection and Testing:

The pipes will be subjected to following tests for acceptance:
Visual and dimensional check as per Clause 13 and 15 of IS 8329
Mechanical Test as per Clause 10 of IS 8329
Hydrostatic Test as per Clause 11 of IS 8329
The test reports for the rubber gaskets shall be as per acceptance tests of the IS 5832 and will be in accordance to Clause 3.8
The sampling shall be as per the provisions of tile IS 8329
All testing of GI (M) pipes accordance with IS code and specification

Marking

All pipes will be marked as per Clause 18 of IS 8329 and show as below: Manufacturer name! stamp.
Nominal diameter
Class reference
A white ring line showing length of insertion at spigot end

Packing and Transport:

The pipes should be preferably transported by road from the factory and stored as per the manufacturer specifications to protect damage.

Hydraulic Testing

Pipes shall be subjected to hydraulic tests for ensuring quality of manufacture as per Sub- clause 8.3.6.1 of this specification.

5.4.5 Specials for Ductile Iron Pipes

5.4.5.1 General

This covers the general requirements for Ductile Iron (DI) fittings suitable for Tyton joints to be used with Ductile Iron pipes with flanged and Tyton jointing system.

5.4.5.2 Types of specials

The following types of DI fittings shall be manufactured and tested in accordance with IS: 9523 or BS: 4772.

- Flanged socket
- flanged spigot
- double socket bends (900, 450, 22 1!2 0, 11 1!4 0)
- double socket branch
- fianged tee all socket tee
- double socket taper
- retrained joints
- All the fittings shall be of class K-12.
- All type of GI(M) fittings shall be manufactured and tested in accordance with IS: 1239

5.4.6 Supply

All the DI fittings shall be supplied with one rubber ring for each socket. The rubber ring shall conform to IS: 12820 and IS: 5382 as described in the preceding chapter. Flanged fittings shall be supplied with one rubber gasket per flange and the required number of nuts and bolts.

5.4.7 Lubricant for ductile iron pipes and specials

5.4.7.1 General

This section covers the requirements for lubricant for the assembly of Ductile Iron pipes and specials suitable for Tyton push-in rubber ring joints

5.4.7.2 Specification

The lubricant has to have the following characteristics:

- must have a paste like consistency and be ready for use
- has to adhere to wet and dry surfaces of DI pipes and rubber rings

- to be applied in hot and cold weather; ambient temperature 0 - 50 ·C, temperature of exposed pipes up to 70 ·C
- must be non toxic
- must be water soluble
- must not affect the properties of the drinking water carried in the pipes
- must not have an objectionable odour
- has to inhibit bacterial growth
- must not be harmful to the skin
- must have a shelf live not less than 2 years
- Acceptance tests
- They shall be conducted in line with the provisions of the IS 9523

5.4.8 Packing

All the DI fittings shall be properly packed with jute cloth. Rubber rings shall be packed in polyethylene bags, Rubber rings in PE bags and nuts, bolts etc shall be supplied in separate jute bags.

The fittings should also be supplied by the manufacturer of the pipes. They should preferably be manufactured by the manufacturer of the pipes. In case they are not, it will be the responsibility of the manufacturer of the pipes to have them manufactured from a suitable manufacturer under it's own supervision and have it tested at his/sub-contractors premises as per the contract. The pipe manufacturer will however be responsible for the compatibility and quality of the products.

5.4.9 Testing of pipe

5.4.9.1 Hydrostatic Testing at Works

The pipes shall be hydostatically tested at works as per provisions of IS 8329, All pipes and specials including jointing material such as rubber rings etc. shall be tested by third party inspection agency as directed by Engineer-In-Charge and shall be witnessed by representative of Engineer-In-Charge.
The contractor shall deposit the inspection fees initially and shall be reimbursed on of the proof of the same from provisional sum.

5.4.10 Specifications

5.4.11 **Handling of pipes and specials.**

5.4.11.1 During manufacturing and during the entire period of the application of concrete or mortar lining protection and the curing thereof, the section shall be carefully supported and handled so as to avoid injury to the fresh lining. If a pipe section must be rolled or otherwise moved, such operation shall be done slowly and with every reasonable precaution against damage. Any portion of the lining, coating that may become damaged shall be cut and replaced.

5.4.11.2 During delivery, all sections shall be handled by such means and in such a manner that no distortion or damage is done to the protection or to the section as a whole.

5.4.12 **Fixing of fixtures**

5.4.12.1Contractor has to fix the required number of fixtures at proper locations as per tile site requirement and the instructions of Engineer-In-Charge. The fixtures shall be fixed to the flanges by bolts, nuts and washers with necessary fire ply/rubber insertions etc. All types of fixtures and necessary equipment required for fixing these fixtures shall be arranged by the Contractor at his own cost.

5.4.12.2 Specifications for Laying and Jointing of Pipe Line System for Water Supply Preparatory work

5.4.12.3The contractor will inspect the route along which the pipe line is proposed to be laid. He should observe! find out the existing underground utilities! construction and propose an alignment along which the pipeline is to be laid. He should make all efforts to keep the pipe as straight as possible with the help of ranging rods. Whereever there is need for deviation; it should be done with the use of necessary specials or by deflection in pipe joints (limited to 75% of permissible deflection as per manufacturer). The alignment as proposed should be marked on ground with a line of white chalk and got approved from Engineer-In-Charge. The Contractor will than prepare an L-Section along this alignment showing the location of proposed pipe line. The L-section should be got approved from the site Engineer-In-Charge. The position of fittings, valves, should be shown on the plan.

5.4.13 **Alignment and the L-Sections**

The alignments, L-section (depth of laying) and location of specials, valves and chambers may be changed at site in co-operation with and after approval of the Engineer-In- Charge.

5.4.14 **Standards! Specifications**

Except as otherwise specified in this technical specification, the Indian Standards and Codes of Practice in their latest version, National Building code, PWD specification of the state of Utlarakhand and Manual of Water Supply of GOI shall be adhered to for the supply, handling, laying, installation, and site testing of all material and works.

5.4.15 **Tools and equipment**

The contractor has to provide all the tools and equipment required for the timely, efficient and professional implementation of the work as specified in the various sections of the contract and as specified by the instructions of manufacturers of the pipes and other material to be handled under this contract. On demand he shall provide to the Engineer- In-Charge a detailed list of tools and equipment available. If in the opinion of the Engineer-In-Charge the progress or the quality of the work cannot be guaranteed by the available quantity and type of tools and equipment the contractor has to provide additional ones to the satisfaction of the Engineer-In-Charge. The contractor will always have a leveling instrument on site.

5.4.16 **Handling and laying of pipes**

5.4.16.1**Transportation of pipes and specials**

The Contractor has to transport the pipes and other materials from manufacturer to the site of laying as indicated by the Engineer-In-Charge. Pipes should be handled with care to avoid damage to the surface and the socket and spigot ends. Deformation or bending. Pipes shall not be dragged along the ground or

the loading bed of a vehicle. Pipes shall be transported on flat bed vehicles/trailers. The bed shall be smooth and free from any sharp objects. The pipes shall rests uniformly on the vehicle bed in their entire length during transportation. Pipes shall be loaded and un-loaded manually or by suitable mechanical means without causing any damage to the stacked pipes.

The transportation and handling of pipes shall be made as per IS 12288. All precautions set out shall be taken to prevent damage to the protective coating. damage of the jointing surfaces or the ends of the pipes.

Whatever method and means of transportation is used, it is essential that the pipes are carefully placed and firmly secured against uncontrolled movement during transportation to the satisfaction of Engineer-In-Charge.

Cranes or chain pulley block or other suitable handling and lifting equipment shall be used for loading and un-loading of heavy pipes. Where using crane hooks at sockets and spigot ends hooks shall be broad and protected by rubber or similar material, in order to avoid damage to pipe ends and lining. Damage to lining must be repaired before pipe laying according to the instructions of the pipe manufacturer. Pipes shall not be thrown directly on the ground.

When using mechanical handling equipment, it is necessary to employ sufficient personnel to carry out the operation efficiently with safety. The pipes should be lifted smoothly without any jerking motion and pipe movement should be controlled by the use of guide ropes in order to prevent damage caused by pipes bumping together or against surrounding objects.
Rolling or dragging pipes along the ground or over other pipes already stacked shall be avoided too.

5.4.16.2 Stringing of pipes along the alignment

The pipes shall be laid out properly along the proposed alignment in a manner that they do not create any significant hindrance to the public and that they are not damaged.
Stringing of the pipes end to end along the working width should be done in such a manner that the least interference is caused in the land crossed. Gaps should be left at intervals to permit the passing of equipment across the working area. Pipes shall be laid out that they remain safe where placed and that no damage can occur to the pipes and the coating until incorporated in the pipeline. If necessary, pipes shall be wedged to prevent accidental movement. Precautions shall be made to prevent excessive soil, mud etc. entering the pipe.
Generally, the pipes shall be laid within two weeks from the date of their dispatch from the manufacturer/store.
The joint gaskets shall be kept in wooden boxes or their original packing and stored in cool conditions and not exposed to direct sunlight Gaskets must not be deformed. They shall be taken out only shortly before they are needed.

5.4.17 Specifications

5.4.17.1**Pipe trench**

All excavation of pipe trenches shall be done in accordance to specification given below is applicable.

5.4.17.2Trench excavation to commensurate with the laying progress.The work of trench excavation should be commensurate with laying and jointing of the pipe line. It should not be dug in advance for a length greater than 500 m ahead of work of laying and jointing of pipeline unless otherwise defined by the Engineer-In-Charge. The Contractor has to ensure the following:

safety protections as mentioned above have to be incorporated in the work process hindrances to the public have to be minimized the trench must not be eroded before the pipes are laid the trench must not be filled with water when the pipes are laid the trench must not be refilled before laying of the pipes excavation maybe done by hand or by machine. The width of the trench shall provide dia of pipe plus 450 mm. if the trench width shall higher side than payment maximum width shall be measured dia of pipe plus 450 mm, if the trench width shall less the above the minimum will be measured. Depth of pipe line in roadway a minimum cover of 1.00 m. is recommended
The bed for the laying of the pipes has to be prepared according to the L-Section immediately before laying of the pipes.

5.4.18 Bedding of the pipes

The trench bottom shall be even and smooth so as to provide a proper support for the pipe over its entire length, and shall be free from stones, lumps, roots and other hard objects that may injure the pipe or coating. Holes shall be dug in the trench bottom to accommodate sockets so as to ensure continuous contact between the trench and the entire pipe barrel between socket holes.
The trench bottom in rock excavation shall be made even and smooth for proper pipe support by laying 100mm thick PCC 1:4:8 (1 cement: 4 coarse sand:8 graded stone aggregate 40mm nominal size) which shall be paid separately as per BOQ.

5.4.19 Laying of pipes

5.4.19.1 General

The pipes will be cleaned in the whole length with special care of the spigot and sockets on the inside! outside to ensure that they are free from dirt and unwarranted projections. The whole of the pipes shall be placed in position singly and shall be laid true to profile and direction of slope indicated on longitudinal sections. The pipes shall be laid without deflection in a straight alignment between bends and between high and low points. Vertical and horizontal deflections between individual pipes need the approval of the Engineer-In-Charge. In no case the deflection shall be more than 75 % of those recommended by the manufacturer.

Before pipes are jointed they shall be thoroughly cleaned of all earth lumps, stones, or any other objects that may have entered the interior of the pipes, particularly the spigot end and the socket including the groove for the rubber ring.

Pipes and the related specials shall be laid by using the recommended tools.
Cutting of pipes shall be reduced to a minimum required to conform with the drawings. Cutting has to be made with suitable tools and according to the recommendations of the manufacturer. The spigot end has to be chamfered again at the same angle as the " original chamfered end. Cutting shall be perpendicular to the centre line of the pipe. In case of ductile iron pipes the cut and chamfered end shall be painted with to coats of epoxy paint if there is no mark for the insertion depth on the spigot and of the (cut) pipe shall be marked again according to the instructions of the manufacture.

Before pipes are jointed they shall be thoroughly cleaned of all earth lumps, stones, or any other objects that may have entered the interior of the pipes, particularly the spigot end and the socket including the groove for the rubber ring. End caps are removed only just before laying and jointing.
All specials like bends, tees etc. and appurtenances like sluice etc. shall be laid in synchronization with the pipes. The Contractor has to ensure that the specials and accessories are ready in time to be installed together with the pipes.

At the end of each working day and whenever work is interrupted for any period of time, the free ends of laid pipes shall be protected against the entry of dirt or other foreign matter by means of approved plugs or end caps.

When pipe laying is not in progress, the open ends of installed pipe shall be closed by approved means to prevent entrance of trench water and dirt into the line.

No pipe shall be laid in wet trench conditions that preclude proper bedding, or when, in the opinion of the Engineer-In-Charge, the trench conditions or the weather are unsuit- able for proper installation.

The pipe line laid should be absolutely straight unless planned otherwise. The accuracy of alignment should be tested before starting refilling with the help of stretching a string between two ends of the straight stretch of pipes to rectify possible small kinks in laying.

5.4.20 Laying and jointing of DI pipes

Pipes should be lowered into the trench with tackle suitable for the weight of pipes. For smaller sizes, up to 250 mm nominal bore. the pipe may be lowered by the use of ropes.

All construction debris should be cleared from the inside of the pipe either before or just after a joint is made. This is done by passing a pull-through in the pipe, or by hand, depending on the size of the pipe. All persons should vacate any section of trench into which the pipe is being lowered.
on gradients of 1:15 or steeper, precautions should be taken to ensure that the spigot of the pipe being laid does not move into or out of the socket of the laid pipe during the jointing operations. As soon as the joint assembly has been completed, the pipe should be held firmly in position while the trench is back filled over the barrel of the pipe. The designed anchorage shall be provided to resist the thrusts developed by internal pressure at bends, tees, etc. The assembly of the pipes shall be made as recommended by the pipe manufacturer and using the suitable tools. The socket and spigot ends of the pipes shall be brushed and cleaned. The chamfered surface and the end of the spigot end has to be coated with a suitable lubricant recommended by the manufacturer of the pipes. Oil, petroleum bound oils, grease or other material which may damage the rubber gasket shall not be used as lubricant. The rubber gasket shall be inserted into the cleaned groove of the socket. It has to be checked for correct positioning. The two pipes shall be aligned properly in the pipe trench and the spigot end shall be pushed axially into the socket either manually or with a suitable tool specially designed for the assembly of pipes and as recommended by the manufacturer. The spigot has to be Deflection of the pipes -if any- shall be made only after they have fully been assembled. The deflection shall not exceed 75 % of the values indicated by the pipe manufacturer.

5.4.21 Jointing

5.4.21.1 Pipes shall be laid to the lines and grades given in the plans, with the ends abutting to form a even joint without shoulders or unevenness of any kind along the invert of the pipes. No joint shall be made under water. The ends of the pipes shall be dry and kept clean before and during laying and jointing operations.

5.4.21.2All joint work shall be done in an approved manner by skilled workmen so that the completed pipeline shall have a continuous, smooth and uniform interior surface. Extruded joint material shall be removed from the interior of the pipe. In cold weather protective measures must be taken to ensure a satisfactory joint.

5.4.21.3Jointing for pipes and fittings I specials shall be done in accordance with the relevant Specifications depending on type of pipes being used.

5.4.21.4The Contractor shall build manholes, inlet manholes, inlets, junction chambers, headwalls, culverts, anchor blocks, thrust blocks and such other miscellaneous structures that may be required at the locations shown by the Engineer-In-Charge and of such forms, dimensions and materials as are shown in the standard details or as may be specified or directed. These structures shall also include the installation of such specials and connections to pipes and other structures as may be required to complete the constructions as shown in the Drawings.

5.4.21.5Anchoring of the pipeline

Thrust blocks shall be provided at each bend, tee, taper, end piece to prevent undue movements of the pipeline under pressure. They shall be constructed as per design of Engineer-In-Charge according to the highest pressure during operation or testing of the pipes, the safe bearing pressure of the surrounding soil and the friction coefficient of the soil.

5.5 Testing of the pipelines

5.5.1 Sectional tests

After laying and jointing the pipeline shall be tested for tightness of barrels and joints, and stability of thrust blocks in sections approved by the Engineer-In-Charge. The length of the sections depends on the topographical conditions. Preferably the pipeline stretches to be tested shall be between two chambers (air valve, scour valve, bifurcation, other chamber).At the beginning, the Contractor shall test stretches not exceeding 1 km. After successful organization and execution of tests the length may be extended to more than 1 km after approval of the Engineer-In-Charge.

The water required for testing shall be arranged by the contractor himself. The Contractor shall fill the pipe and compensate the leakage during testing. The Contractor shall provide and maintain all requisite facilities, instruments, etc. for the field testing of the pipelines. The testing of the pipelines generally consists, the following steps which shall be monitored and recorded in a test protocol if required:

Complete setting of the thrusts blocks.

- partial backfilling and compaction to. hold the pipes in position while leaving the joints exposed far leakage control
- opening of all intermediate valves (if any)

- fixing the end pieces far tests and after temporarily anchoring them against the sail (not against the preceding pipe stretch)
- at the lower end with a precisian pressure gauge and the connection to the pump far establishing the test pressure
- at the higher end with a valve far air outlet
- If the pressure gauge cannot be installed at the lowest paint of the pipeline, an allowance in the test pressure to. be read at the position of the gauge has to be made accordingly
- slowly filling the pipe from the lowest paint(s).
- the water far this purpose shall be reasonably clear and free of solids and suspended matter
- complete removal of air through air valves along the line. Closing all air valves and scour valves.
- Slowly rising the pressure to. the test pressure while inspecting the thrust blacks and the temporary anchoring.
- keeping the pipeline under pressure far the duration of the test by adding make-up water to maintain the pressure at the desired test level. Make up water to. be arranged by Contractor himself at his awn cast.
- start the test by maintaining the test pressure at the desired level by adding mare make-up water; record the water added(Q) and the pressure in intervals of 15 minutes at the beginning and 30 minutes at the end of the test period.
- Water used far testing should not be carelessly disposed off an land which would ultimately find its way to trenches.

- The testing conditions for the pipelines shall be as per the test pressures and condition laid not in IS 8329 for DI pipes.

The pipeline stretch will pass the test if the water added during the test period is not exceeding the admissible limits. No. section of the pipe work shall be accepted by the Engineer-In-Charge until all requirements of the test have been obtained. On completion of a satisfactory test any temporary anchor blacks shall be broken not and stop ends removed. Backfilling of the pipeline shall be completed.
The field test pressure to be imposed shall be

a) 1.5 times the working pressure(1.8MPA).or
b) the maximum pipeline static pressure. whichever is mare

Q = 1.0 litre per km per 10 mm of pipe per 30 m

Test Pressure

All pressure testing at site should be carried out hydrostatically. The pipes shall be accepted to have passed the pressure test satisfactorily. If the quantity of water required to restore the test pressure does not exceed the amount 'Q', calculated by the above formula. Where any test of pipe laid indicates greater Q than that specified as per the above formula, the defective pipe(s) or joints(s) shall be repaired/replaced as per the satisfaction of Engineer-in-Charge until the Q is within specified limits. The Contractor has to make his awn arrangements far water of approved quality, required far testing pipeline. The pipeline stretch will pass the test if the water added during the test period is not exceeding the admissible limits. No section of the pipe work shall be accepted by the Engineer-In-Charge until all requirements of the test have been obtained. On completion of a satisfactory test any temporary anchor blocks shall be broken out and stop ends removed. Backfilling of the pipeline shall be completed.

5.5.2 Failure to pass the test

All pipes or joints which are proved to be in any way defective shall be replaced or remade and re-tested as often as may be necessary until a satisfactory test shall have been obtained. Any work which fails or is proved by test to the unsatisfactory in any way shall be redone by the contractor. If any

5.5.3 Flushing of pipelines

After testing and commissioning the contractor shall flush the pipes with a velocity not less than 1 mls or as approved by the Engineer-In-Charge.

5.5.4 Disinfecting **of** pipelines

The pipeline shall be flushed prior to disinfection. After initial flushing, the hypochlorite solution shall be applied to the water main with mechanically or electrically powered chemical feed pump designed for feeding chlorine solutions. The water from approved source of supply shall be made to flow at a constant measured rate into the newly laid pipeline. The water shall receive a dose of chlorine also fed at a constant measured rate. The chlorinated water should receive treatment to dilute the chlorine to an acceptable level before discharge to sewer or water course. Water from approved source and the chlorine from selected source shall be fed at constant rate into the new main at a concentration of at least 20 to 50 mg/litre. A properly adjusted hypochlorite solution injected into the main with a hypo-chlorinator, or liquid chlorine injected into the main through a solution feed chlorinator and booster pump may be used. The chlorine residual should be checked at intervals to ensure that the proper level main is filled. All valves, hydrants, etc, along the main 'should be operated to ensure their proper disinfection. The water should remain in the main for a minimum of 24 hours. Following the 24 hour period, no less than 10 mgll chlorine residual should remain in the transmission main.

After a further 24 hours, samples should be taken for bacteriological examination at a number of points along the pipeline and at all extremities. After final flushing and before the water pipeline is placed in service, a sample or samples shall be collected from the end of the line and tested for bacteriological quality and shall show the absence of coli form organisms. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory results are obtained. This shall be done without any additional cost.

5.6 PIPELINE APPURTENANCES

5.7 Scope

This Specification covers the requirements for pipeline appurtenances like Surge Protecting Device, Valves and Valve Chambers, Electro Chloronitor, Electro-magnetic Flow Meter, Anchor Blocks, Thrust Blocks, etc., required to be provided for various water supply pipelines.

5.8 Valves

5.8.1 Sluice Valves

5.8.1.1 General

This section covers the requirements for non rising stem type sluice valve from 80 mm to 300 mm size. The valves will be used for water supply on line installations in upright positions, up to 450 C working temperature, with double flange and cap or hand wheel, for manual operation.

5.8.1.2 Nominal pressure and dimensions

The working pressure of the valves shall be 10 kg/cm2 (1.0 Mpa) for Class-I and 16 Kg/cm2 (1.6 Mpa) for Class-II. The dimension and mass of the sluice valves shall be in accordance with IS: 14846 for sizes from 80 to 300 mm. The flanges and their dimensions of drilling shall be in accordance with IS:1538 (part-I to XXII).

5.8.1.3 Material of Construction

The material for different components parts of sluice valve shall conform to requirements given below:

Component	Material	Ref. to IS	Grade Designation
Body, bonnet, wedge stuffing box, gland, thrust plate, capetc.	Grey cast iron	210	FG200

Hand wheel Stem Wed;:Jenut			Grey cast iron	210	FG 200
			Stainless steel	6603	AIS1431, AISI 410
			Leaded tin bronze	318	LTB 2
Body seat	ring,	wedge	Leaded tin bronze	318	LTB 2
facing ring					
Bushes			Leaded tin bronze	318	LTB2
Bolt			Carbon steel	1363	Class 4.6
Nut			Carbon steel	1363	Class 4
Bonnet gasket			Compressed fibre board	2712	C
Gland packing			Jute & hempl Graphite	4687	-

5.8.1.4 Coating

All sluice valves shall be coated by dipping in a bath of tar base composition as given in IS: 14846 for sizes from 80 mm to 300 mm. All components susceptible to corrosion attack shall be coated internally and ex1ernally. Protective coating shall always be applied to the individual components before they are assembled, following shot blasting to give good adhesion. Marking Testing and Inspection - The standard marking and packing of the valves shall be done as per IS: 14846. The direction of rotation for OPEN, CLOSE position shall be marked on the hand wheel and on the bonnet of the valve. Testing of sluice valve shall be done for close end in accordance with IS: 14846. All the valves shall be inspected for flaw detection test in accordance with IS: 14846.
Sluice valves shall be tested for:
Seat leakage test

Body hydrostatic test
Valve operation
The design, construction material, manufacture, inspection, performance and testing shall comply with all applicable Indian Standards and Codes. Nothing in the specification will be construed to relieve the supplier of this responsibility.

5.8.1.5 Measurement and Rate

Valves will be measured in numbers. Rate to include cost of valves, fixtures including labor for fitting fixing as per drawing and or direction of the Engineer-In-Charge and satisfactory testing.

5.8.2 Air Valves

5.8.2.1 Scope

Air Valve shall be automatic double ball Kinetic Air valves to be used for evacuation of accumulation of air in water mains under pressure, for the exhaust of air when such mains are being charged with water and for inlet of air when they are emptied of water. Air valves shall confirm to IS 14845. The design shall be such that higher the rate of flow the greater the resultant down thrust keeping the ball 'glued' to its seat until the last drop of air is expelled from the pipe system. The valves shall have an integrated sluice valve. The valves shall flanged ends machined and drilled according to IS 1538 (Part IV and VI) and IS 6418. The possible air velocity (inflow and outflow) must be at least 10 m/s. The working pressure of the air valves shall be 10 kg/cm2 (1 Mpa) unless specified otherwise.

5.8.2.2 Construction feature

The flow of air should be as unobstructed as possible. The low pressure orifice shall be in the same axis as the main discharge incoming air flow and must have a diameter sufficiently large. The cone angle in the low pressure (large orifice) chamber should be carefully calculated and there should be adequate height to allow for free movement of the vulcanite ball in the low chamber. The annulus around the low pressure vulcanite covered ball is to be generously proportioned for discharge of air under various differential pressures. The orifice shall be carefully profiled to allow the requisite flow of air under varying differential pressure. It shall be in moulded synthetic rubber such that even after extended contact the vulcanite covered ball does not stick to it when the line pressure becomes zero. In the high pressure chamber the orifice shall be in profiled in such a manner that the rubber covered ball is not damaged even after extended contact. There should be machined guide in the chamber which ensures that the ball travels vertically and makes contact with the nipple and seals off the orifice without fail.

5.8.2.3 Material of Construction

The material for different components parts of the air valve shall conform to requirements given below:

Component Body	Material of Construction Cast Iron conforming to IS: 210 GR FG 200
High Pressure Cover	Cast Iron confirming to IS 210 GR FG 200
Low Pressure Cover	Cast Iron confirming to IS 210 GR FG 200
Cowl	Cast iron confirming to !S 210 GR FG
High Pressure Orifice Plug	Stain less steel conforming to AISI410

Low pressure ball	Vulcanite covered seasoned timber
High pressure ball	Rubber covered seasoned timber
Lower pressure seat ring	Define (Nitride rubber)
Isolating sluice valve	Conforming to IS: 780 - 1984
Spindle for sluice valve	Stainless steel conforming to AISI410
Bolts and nuts	Mild steel

The body and seat of the valve shall withstand a working pressure of 10 kg/cm2 for at least 15 minutes.

5.8.2.4 Measurement and Rate

Valves will be enumerated in numbers. Rate to include cost of valves, fixtures etc. including cost of labor for fitting fixing as per drawing and or direction of the Engineer-In-Charge and satisfactory testing all complete.

5.8.3 Non Return Valve/ Reflux valve

5.8.3.1 General

Non Return Valve / Reflux valves shall be dual plate check type and shall conform to relevant IS Codes/API 594. They shall have metal to metal sealing. The spring action shall optimize the equal closing rates of each plate especially when the friction coefficients are uneven due to one plate resting upon the other. The plates shall not drag on the seat while opening. The plates shall not vibrate under full or partial flow condition. The pressure drop in the valve at design flow shall be limited to 0.4 mWC.

5.8.3.2 Material of Construction

Body Plate Spring Seal CI IS 210 Gr FG260 SS AISI316 SS AISI316 SS AISI 304

5.8.3.3 Design Parameter

Type Size Nature of operation Closure characteristic Dual plate As per BOO Horizontal Non slamming Design Pressures of valve shall vary Class-I, Class-II, Class 300 and 500 as specified in the BOO)

5.8.3.4 **Tests Acceptance tests as per relvant IS Codes / API 598**

5.8.3.5 Measurement and Rate

Valves will be enumerated in numbers. Rate to include cost of valves, fixtures etc. including cost of labour for fitting fixing as per drawing and or direction of the Engineer-In-Charge and satisfactory testing all complete.

5.9 Electromagnetic Flow Meter

5.9.1 General

Electromagnetic flow meter shall be installed on-line and shall consist of flow sensor (i.e. flow tube), flow transmitter and flow indicator and integrator and any other item required to complete the system. Flow measurement shall not be affected by physical properties of water viz., temperature, pressure etc., within given limits. Contractor shall provide
compensating electronic circuits, if required. The flow computer and transmitter shall be a single unit suitable for field mounting. It shall accept inputs from fiow tube process the signals and shall provide an output proportional to the flow rate. The output shall be suitable for transmitting over a long distance.

Electromagnetic flow meter shall be tested by third party inspection agency as directed by Enginer-In-charge and shall be witnessed by representative of Enginer-In-Charge.

The contractor shall deposited the inspection fees as required by the employer initially and shall be returned back if materials is found satisfactory in inspection.

5.9.2 Design Parameters

Accuracy of flow measurement	± 0.5% of measured value
Flow tube	
Type	In line full bore electromagnetic
Size of flow tube	Same as pipe size
Process connection	Flanged
Weather Protection Category	IP 68 as per IS 13947
Surge protection devices (SPD) flow tube and flow transmitter	Required for protection from lightning surges

Material of Construction: SS 316
Electrodes SS 316
Coil Housing SS 316
Connection Flanges SS 316
Grounding ring Flow tube Lining Hard rubber (SPR or EPDM) Housing Sheet Steel polyurethane coated

Flow Transmitter Unit

(i) Type Microprocessor based with facility to configure the ranges.

4 digit back lit LCD! LCD, for actual flow rate in m3!hr.

i) Type of display 8 digit backlit LCD/ LCD for totalized flow in ML
ii) Units of display Actual flow rate -m3 ! hr Totalized flow - ML
iii) Input From flow tube
iv) Output 4-20 mA DC (isolated) proportional to flow rate
v) Zero and Span Adjustment Required
vi) Weather Protection Category IP 65 as per IS 13947 Battery backup for totalized flow
vii) Type Online Capacity 2.5 mVA Backup Time 8 hours

5.9.3 Salient features

The flow meter shall have the feature of automatic rejection of faulty measurements, Automatic compensation of hydraulic coefficient and shall allow for change of sound velocity.

Displays: The flow meter shall have a back lit display panel with min 2 lines 16 characters each and shall display Flow rate, flow direction, volume and defaults. The meter shall be calibrated and tested by actual flow tests at different rates of flow as per relevant Codes.

5.9.4 Calibration

The Electromagnetic flow meter shall be calibrated for the full flow range specified as per BS EN 29104 (Methods of evaluation of electromagnetic flow meters). The calibration method shall be either gravimetric method as per ISO 4185 (Measurement of fluid flow in closed conduits - weighing method) or volumetric method as per ISO 8316 (Calibration by Volumetric Method). The 'test bed' shall be accredited by National International certifying authority. The Contractor shall produce accreditation certificates for the test facility and calibration certificate for the flow meter. The Contractor shall also demonstrate complete calibration on the test bed in the flow meter laboratory.

5.9.5 Measurement and Rate

Valves will be enumerated in numbers. Rate to include cost of valves, fixtures etc. Including cost of labor for fitting fixing as per drawing and or direction of the Engineer-In-Charge and satisfactory testing all complete.

5.10 Electro Chlorinator

5.10.1 General

Specification describes the requirement for supply, installation, testing & commissioning of batch type (in 8-Hr batch) sodium hydro chlorite generating system with dosing cum metering equipment to deliver free (active) chlorine in the form of sodium hypochlorite solution to the filtered water line at the inlet of fresh water Electro Chlorinator shall be simple to operate and maintain. The power supply panel shall be provided with a timer that is set at 8 hour or as required. System shall have an electronic pump for dosing.

The Electro chlorinator system shall be utilizing food grade salt, fresh water (conforming to quality of drinking water) and AC electric power to produce average 7 gm/liters (0.7%) equivalent chlorine in the form of hypochlorite solution. The unit shall be compact, preassembled and factory tested and shall include the following items suitable for operation on 415 volt +1-10% 3 phase 50 Hz ac Supply.

Electro Chlorinator shall be tested by third party inspection agency as directed by Engineer-In-Charge and shall be witnessed by representative of Engineer-In-Charge.

The contractor shall deposited the inspection fees initially and shall be reimbursed on production of the proof of the same from provisional sum.

5.10.2 Technical Parameters

The Electrolyses module will be floor standing and will consist of one single common tank/two separate tank for brine preparation and hypochlorite production, fitted with a bipolar electrode for converting the brine into hypochlorite solution. It shall be of sufficient capacity 200 gm/hr (minimum) of equivalent chlorine at specific current & voltage defined by the Supplier.
The electrodes shall be made of high corrosion resistant material.

The cell body shall be constructed of non-corrosive and electrically non-conductive CPVC and Fiber reinforced plastic (FRP)/molded polypropylene with integral inlet and outlet flanges. A transparent cell window shall be provided to allow easy inspection of cell internals. Dimensionally stable anodes (DSA) shall be provided to power consumption. Transparent acrylic cell window shall be used for visual inspection of the cell internals and also to check the for effectiveness of the acid clearing operation.

Electrolytic cell shall be protected against low feed flow, high cell voltage/current suitably to prevent damage to the electrodes. Sampling points shall be provided near the inlet and outlet nozzles of the electrolyser with manual isolation valves to analyze the solution during normal as well as cleaning operation.

Individual cells shall be provided with Hydrogen vent nozzle and pipe connections to avoid build up of hydrogen inside the cells.

5.10.3 Process Instrumentation Control and Interlocks

A) All electrical & instrumentation shall be suitable for non hazardous area with IP55 IIP56 class protection.
B) Flow indicator shall be provided at the inlet of the electrolyser unit.
C) In addition to the control arrangement of tile different components described earlier, necessary instruments & automation shall be incorporated in the system with the following trip & shutdown conditions. Auto stop of the unit after completion of batching time. Electronic timer shall be provided. High voltage/currents in the electrolyser, rectifier trips. High level in hypo storage tank, the electrolyser trips

5.10.3.1Instrumentation and Power Cable

A) Suitable power cables preferably of copper, for connecting the unit with the existing Power distribution panel of the Employer shall supplied and installed by the Supplier.
B) The D.C. power cables for interconnection between the generator and D.C power supply unit shall be in the scope of Supply for wiring at site.

5.10.4 Online Residual Chlorine Monitor

A) An online residual chlorine monitor shall be provided to measure the free residual chlorine level in the chlorinated water at the outlet of the fresh water reservoir of the utility building.
B) An analog signal showing the value of the free chlorine shall be displayed in the local control panel.

Active Chlorine Generation Batch Time Total Chlorine Produced Hypochlorite strength Water that can be treated with 1 ppm of chlorine AC current Input 200 to 250 gms /hr 8 hours 2000 grams 7 - 8.0 Gpl 20,00,000 liters (approx.) per batch 230 V, 50 Hz

5.10.5 Material of Construction Anode Cathode Coating

Internal Fasteners External Fasteners Cell life (min) Coating Life (min) Titanium Platinum group of metal oxides like, Ruthenium and Iridium Titanium SS316 4 to 5 years 4 to 5 year

5.10.6 Measurement and Rate

Chlorinator will be enumerated in numbers. Rate to include cost of supply, installation. testing & commissioning of Electro - Chlorinator unit including cartage, cost of all labour & jointing material all complete as per direction of the Engineer-In-Charge and satisfactory testing all complete.

5.10.7 Valve Actuators

5.10.7.1General

All actuators shall be motorised type and local controls shall be protected by a lockable cover.

Each actuator shall be adequately sized to suit the application and be continuously rated to suit the modulating control required. The gearbox shall be oil or grease filled, and capable of installation in any position. All operating spindles, gears and head stocks shall be provided with adequate points for lubrication.

The valve actuator shall be capable of producing not less than 1Y, times the required valve torque considering valve spindle jamming and shall be suitable for a least 5 continuous operation.

The actuator starters shall be integrally housed with the actuator in robustly constructed and totally enclosed weatherproof housing. The motor starter shall be capable of starting the motor under the most severe conditions.

The starter housing shall be fitted with contracts and terminals for power supply, remote control and remote positional indication, and shall also be fitted with internal heaters so as to provide protection against damage due to condensation. Heaters shall be suitable for single phase operation. The heaters shall be switched "ON" when the starters are "OFF" and shall be switched "OFF" when the starters are "ON".

5.10.7.2 Technical Parameters

Each actuator shall be equipped as follows:

(a) AC electric motor with engage/disengage clutch mechanism of the dry type.
(b) Reduction gear unit (with thrust bearing if required)
(c) Torque switch mechanism

(d) Limit switch mechanism

(e) Geared hand wheel for manual operation of valve

(f) Valve position indicator - open/closed

(g) Auto-Manual lever with suitable locking arrangement

(h) Valve position transmitter

(i) Reversing contractor starter complete with overload relays of suitable range and adequately rated control fuses

(j) Actuator with integral starter complete with overload relays of suitable range and adequately rated control fuses

(k) 415 V/11 0 V AC control transformer

(l) A white lamp for supervision of main supply to be provided locally.

(m) A potential free contract shall be provided to annunciate over load trip/main supply failure on remote panel

(n) Provision for local as well as remote operation

5.10.7.3 Special Features

Valve Actuator shall have following special features:

a) Two (2) nos. interposing relays for matching the control voltage of remote commands.

b) The motor shall be specially designed for valve operation, combining low inertia with a high torque and with linear characteristics.

c) All motor actuators shall be provided with visible local valve position indicators mounted on the actuator assembly itself.

d) The torque switch shall be function to stop the motor on closing or opening of the valve, on actuation by the torque when the valve disc is restricted in its attempt to open or close. A minimum of two (2) torque switches, one for closing direction and one for opening direction shall be provided.

5.10.8 Installation of valves

5.10.8.1General

The installation of valves shall be installed between flanges according to the instructions of the manufacturer and the Engineer-In-Charge.

5.10.8.2Valves shall be placed on a support of concrete so that no shear stress is in the flanges. In case of axial thrust due to closure of a valve against pressure the valve shall be anchored in the support in a suitable manner to transfer the thrust into the floor slab of the chamber.

5.10.9 Chambers for valves

5.10.9.1General

Valve chambers shall be constructed according to the typical drawings suitable for the respective valve and special arrangement to be given by Engineer-In-Charge. They shall be constructed in brick masnoary with cement plaster on the walls. The top slab cover shall be cast in situ in reinforced concrete.

The chambers shall be constructed after the laying of the pipes and the assembly of specials and valves. The size of the chambers shall be according to the following criteria as per direction of Engineer-In-Charge.

distance of flanges from walls: 30 cm
distance of sockets from walls: 30 cm
distance between highest point of equipment and roof slab: 30 cm

Pipes passing through walls should be coated by two layer of soft material (hessian felt) to allow for differential settling and longitudinal expansion if directed by Engineer-In- Charge. Only metallic pipes may be cast into the walls for anchoring purposes.

A suitable locking device may be got constructed by Engineer-In-Charge, if required at site.

The work shall include excavation, consolidation, levelling, 10 cm of lean concrete, foundations, finishing, refilling. It shall include all labour and material required for the complete chamber

5.10.10 Excavation

a. Excavation shall be done in accordance with Chapter 4 of this Specification. The rate quoted for manhole shall be inclusive of excavation and backfilling, bailing or pumping out water and shoring.

1. Bed concrete The bed concrete shall be done in accordance with Chapter 5 of this Specification.

2. Pipe entering or leaving manhole

3. Whenever a pipe enters or leaves a manhole, bricks on edge must be out to a proper form and laid around the upper end of the pipe so as to form an arch. All around the pipes, there shall be a joint of cement mortar 1:2 13 mm thick between it and the bricks.

4. Manhole cover

b. All Manhole cover shall be of Ferro cement of specified sizes except where RCC slab cover shall be provided as provisioned in the BOQ.

1. Scour valve chambers

2. Scour valve chambers shall be constructed according to the typical drawings enclosed suitable for the respective scour valve and special arrangement The chambers for scour valves shall be off-line and placed on the scour pipe. There is a closed chamber containing the scour valve, according to the chambers for sluice valves.

3. All specifications and constructional details for the valve chambers apply for the scour chambers accordingly.

5.10.11 Thrust blocks

1. The thrust blocks shall be of concrete M15 cast on site with proper reinforcement as per design and drawings. The thrust blocks shall be cast directly against the undisturbed soil. If this is not possible, the backfilled soil at the contact surface shall be compacted well to full satisfaction of Engineer-In-Charge so that anchor block is not displaced during operation and testing.

2. Backfilling around chambers and thrust blocks

a. After the completion of chambers and thrust blocks the space between the structure and the excavation shall be backfilled with compacted material. Such backfill shall be placed in layers of 15 cm measured before compaction, wetted, if necessary, to optimum moisture and compacted well as per instruction of Engineer-In-Charge

5.10.11.1 Measurement and Rate

The pipe pedestal (pillar) and thrust block shall be measured incubic merers. The unit rate of pipe pedestal (pillar) and thrust block shall be inclusive of all labour, material, tools & plant, construction and incidental charges to the satisfactory competition of the work

5.10.12 Other civil and related works

Crossing of existing Distribution Pipes and connecting pipes

Existing transmission and distribution pipes and connecting pipes of standpipes have to be protected during the laying of the pipes. In case of impossibility of deviation, the pipes have to be replaced according to the instructions of the Engineer-In-Charge and in co- operation with the local representative of line deptt. of Uttarakhand Jal Nigam. The Contractor has the full responsibility in case of destruction of pipes due to inattention of his staff. All costs for the reinstatement of the original status of the pipes in case of damage have to be borne by him.

5.10.13 Testing and commissioning

5.10.13.1 Commissioning general

After successful sectional tests after pipe laying and other pre-commissioning tests after physical completion, the pipeline shall be commissioned by the Contractor. Dynamic commissioning shall be made in conjunction with or after the commissioning of the respective system.

During testing/commissioning, the Contractor shall supply all material and labour to supervise, adjust, test, repair and do all things necessary to maintain the testing/ commissioning. This shall include labour on a 24 hour-a-day basis during the test period and for such other period of continuous operation as the Engineer-In-Charge may consider necessary to establish the efficient operation of the cluster distribution system.

If any test result shows noticeable variation from the specification requirements for the system the Contractor shall immediately take steps to rectify the deficiency without any extra cost to Engineer-In-Charge.

The Contractor shall test and commission the system for 7 days at a stretch, from the date of commissioning. On expiry of this period the system shall be taken over by the Engineer-In-Charge and a taking-over certificate shall be issued by the Engineer-In- Charge, provided all defects and/or deficiencies noticed are rectified to the satisfaction of the Engineer-In-Charge.

Generally, the timing of most of the commisSioning tests will depend on the availability of the respective pumps, the water and power availability at the pumping station and the completion of the reservoir.

Should the supply of water from the pumping station fail or should any other event beyond the Contractor's control interfere, the commissioning shall be during such a number of operational periods as the Engineer-In-Charge may consider equivalent. Any repairs or replacement required during this period shall be done by the Contractor at his own cost.

The Contractor shall allow for commiSSioning to be conducted at any time during the commissioning period without extra charges under the Contract.

The main indicators for the successful commissioning are: no leaks in pipes, joints, specials and valves all valves are properly installed and operational
execution of the entire work including finishing according to the drawings and the specifications submission of as built drawings

5.10.13.2 Dynamic commissioning

The dynamic commissioning shall commence after the work has been physically completed to the satisfaction of the Engineer-In-Charge. It shall simulate the design and operation conditions which are as follows:
All branches into existinq lines (if already in position) to be shut off.
Pump in operation, pump discharging into the transmission main. This is for the commissioning of the transmission pipe only.
Water being put into the system through overhead tank or direct pumping as the case maybe.
Closing of the valves against full static or dynamic pressure.
Operation of all valves including scour valves (open-close-open).
Operation of all air valves.
Operation of all locking arrangements of valve chambers.

5.11 Surge Protection Devices

5.11.1 Zero Velocity Valve

5.11.1.1Salient Features:

- Self-actuating.
- Not requiring external energy for actuation.
- Suitable for installed at remote.
- Suitable for use for all kinds of mains.
- Easy installation with flange
- Corrosion resistant.

5.11.1.2 Material of Construction:

MS IS 2062, Sliding surfaces lined with Stainless Steel and Brass! Gun.

5.11.1.3 Measurement and Rate

Valves will be enumerated in numbers. Rate to include cost of valves, fixtures etc. including cost of labour for fitting fixing as per drawing and or direction of the Engineer-In- Charge and satisfactory testing all complete.

Galvanized Mild Steel (GI) Pipes

The pipes shall be galvanized mild steel welded pipes and seamless screwed and sockets tubes conforming to the requirements of IS.1239, for medium grade. These shall be of the diameter (nominal bore) approved. The sockets shall be designated by the respective nominal bores of the pipes for which they are intended. The pipes and sockets shall be finished neatly, well galvanized on both inner and outer surfaces, and shall be free from cracks, surface flaws, laminations and other defects. All screws, threads shall be clean and well cut. The ends shall be cut cleanly and square with the axis of the tube.

All screwed tubes and sockets shall have pipe threads conforming to the requirements of IS.554. Screwed tubes shall have taper threads while the sockets shall have parallel threads.

The fittings shall be of malleable cast iron or mild steel tubes complying with all the appropriate requirements as approved for pipes. The fittings shall be designated by the respective nominal bores of the pipes for which they are intended. The fittings shall have screw threads at the ends conforming to the requirements of IS.554. Female threads on fittings shall be parallel and male threads (except on running nipples and collars of unions) shall be tapered.

The pipes and fittings shall be inspected at site before use to ascertain that they conform to the specification. The defective pipes shall be rejected. Where the pipes have to be cut or re-threaded, the ends shall be carefully filled out so that no obstruction to bore is offered. The ends of the pipes shall then be threaded conforming to the requirements of IS.554 with pipe dies and taps carefully in such a manner as will not result in slackness of joints when the two piece are screwed together. The taps and dies shall be used only for straightening bent and damaged screw threads and shall not be used for turning of the threads so as the make them slack, water tight joint. The screw thread of pipes and fitting shall be protected from damage until they are fitted.

The pipes shall be cleaned and cleared of all foreign matter before being laid. In jointing the pipes, the inside of the socket and the screwed end of the pipes shall be oiled and rubbed over with white lead and

few turns of spun yarn wrapped around the screwed end of the pipe. The end shall then be screwed in the socket, tee, etc, with the pipe wrench. Care should be taken that all pipes and fittings are properly jointed so as to make the joints completely water tight and pies are kept at all times free from dust and dirt during fixing. Burrs from the joint shall be removed after screwing. After laying, the open ends of the pipes shall be temporarily plugged to prevent access of soil or any other foreign matter.

Any threads exposed after jointing shall be painted or in the case of underground piping thickly coated with approved anticorrosive paint to prevent corrosion.

For internal work the galvanized iron pipes and fittings shall run on the surface of the walls or ceiling (not in chase) unless otherwise specified. The fixing shall be done by means of standard pattern holder bat clamps. Keeping the pipe about 1.5 cm clear of the wall, Pipes and fittings shall be fixed truly vertical/horizontal. When it is found necessary to conceal the pipes, chasing may be adopted or pipes fixed in the ducts of recesses etc, provided there is sufficient space to work on the pipes with the usual tools. The pipes shall not ordinarily be buried in walls or solids floors. Where unavoidable, pipes may be buried for short distances provided adequate protection is given against damage, but the joints in pipes shall not be buried MS pipe sleeve shall be fixed at a place where a pipe is passing through a wall of floor for reception of the pipe and to allow freedom for expansion/contraction and other movements maintenance. In case the pipe is embedded in walls or floors it should be painted with anti-corrosive bitumastic paint of approved quality. The pipe should not come in contract with lime mortar or lime concrete as the pipe is affected by lime. Under the floors the pipes shall be laid in layer of sand filling or as approved by the Project-in-Charge.

GI pipes with socket and spigot ends shall be provided with lead caulked joints wherever specified and the joints shall conform to the requirements of IS:3114.

The work of excavation and backfilling shall be done true to line and gradient in accordance with general Employer's requirements for earthworks in trenches for pipes laid underground.

PVC pipes shall be laid on a layer of 10.0 cm sand and sand filled upto 15 cm above the pipes. A sand cushion of 15 cm on either side of the pipe shall also be provided. The remaining portion of the trench shall then be filled with excavated earth. The surplus earth shall be got rid of as directed. When excavation is done in rock the bottom shall be cut deep enough to permit the pipes to be laid on a cushion of sand 75 mm minimum.

The pipes and fittings after they are laid and jointed shall be subjected to hydrostatic pressure test as approved by the Project-in-Charge and shall satisfactorily pass the test. Pipeline system shall be tested in sections as the work proceeds, keeping the joints exposed for inspection. Pipes shall be slowly and carefully charged with water allowing all air to escape. All draw-off taps shall then be closed and water pressure gradually raised to test pressure. Care shall be taken to ensure that pressure gauge is accurate and preferably should have been recalibrated before the test. Pump used having been stopped the section of the pipeline shall maintain the test pressure for at least half an hour. Any joints or pipes found leaking should be removed and replaced by the Contractor.

The GI pipeline shall be cut to the required length at the position where the meter and stopcock are required to be fixed. The ends of the pipes shall be threaded. The meter and stopcock shall be fixed in position by means of connecting pipe, G.I nuts, sockets, etc. The stopcock shall be fixed near the inlet of the water meter. The paper disc inserted in the ripples of the meter shall be removed and meter

installed exactly horizontally or vertically and with the arrow cast on the body of the meter pointing in the direction of flow. Care shall be taken that the factory seal of the meter is not disturbed. Whenever the meter is to be fixed to a newly fitted pipeline, the pipeline will have to be completely washed before fixing the meter. For the purpose, a connecting piece of pipe equal to the length of the meter is to be fixed on the new pipeline. The water shall be allowed to flow completely to wash the pipeline and then the meter installed as described above by replacing the connecting piece.

Bored Well / Tube Well

Bored wells are tubular wells drilled into permeable layers to facilitate abstraction of ground water through suitable strainers into the well extending over the required range or ranges of the water bearing strata. There are various ways of drilling such wells through different soils and for providing suitable strainers with gravel shrouding, where necessary.

These wells are used for obtaining water from shallow as well as deep aquifers. Open end tubes are sunk by removing the material from the interior by different methods.

After the required depth is reached the pipe with the cutter is taken out of the bore and the well pipe with the strainer is then lowered into the hole. The annular space between the bore and the well screen is then shrouded with pea gravel. Casing of wells in soft soils must be cased throughout. When bored in rock it is necessary to case the well at least through the soft upper strata to prevent caving. Casing is also desirable for the purpose of excluding surface water and it should extend well into the solid stratum below. Where artesian condition exists and water will eventually stand higher in the well than the adjacent ground water, the casing must extend into and make a tight joint with the impervious stratum to prevent escape of water into the ground above.

Large casing is generally made of welded or riveted steel pipe. For smaller sizes of pipes which are to be driven, the standard wrought iron pipes are generally used; for heavy driving, extra strong pipe is necessary. The life of the pipe is affected by corrosion due to the carbonic acid encountered in some cases. The use of rust resisting alloys is advisable in such cases. Non-reinforced plastic, usually PVC casing up to 100 mm dia and reinforced plastic casing and fibre glass for longer dia up to 400 mm, are coming into vogue. In providing the strainer arrangement whereby water is admitted and sand or gravel excluded, it is desirable to make the openings of the strainer as large as practicable to reduce friction while at the same time preventing entrance of any considerable amount of sand. Where the acquifer consists of particles that vary widely in size, however, the capacity of the well is improved by using strainer openings through which the finer particles are drawn into the well while the coarser ones are left behind with increased void space. The size of openings may be selected after a study of the mechanical analysis of the acquifer material to permit the passage of all fine particles representing a certain percentage, by weight, of the water bearing material.

PUMP HOUSE

The pump house shall be of adequate size and shall be located at suitable place by the side of clear water sump. It will also include dry pump pit. The pump pit shall be of adequate size to accommodate 4 number Pumping sets of suitable capacity each. The floor of pump pit shall not be deeper by more than 3.6 meter from ground level. 1.2 meter wide R.C.C. stair shall be provided on each side of the pump house for going down to the pump pit floor and also provided with 25 mm G.I. pipe railing in three rows fixed in R.C.C. Post on both side of the stair.

The walls of the pump chamber below plinth level shall be of R.C.C. The floor of entire pump chamber and walls shall be suitably designed to take the sub-soil water pressure & earth pressure. Walls below

ground level shall be plastered with 12 mm thick cement plaster (1:3) with 3% water proofing compound. The out surface of wall below ground level shall have two layers of tar felt. The pump base shall be separately cast and 40 mm thick gap between the floor and the pump base shall be filled with tar felt or other suitable materials to check vibrations being transmitted to other part of the structure at the same time to prevent leakage of sub-soil water.
Manually operable 3 M.T. capacity Gantry crane with chain pulley block shall be provided in the pump house. The pump house shall be provided with mono rail girders and proper size rails for 3 M.T. Capacity crane. The alignment of the mono rail will be suitably designed to have proper lifting arrangement of mechanical / electrical equipment for repair / maintenance purpose.

The floor and walls up to the plinth level of the pump chamber shall have vitrous tiles of approved color and shade, properly finished and polished. Central platform and stairs going to pump pit shall also have vitrous tiles.

The brick wall shall be plastered with 12 mm thick (1:6) cement plaster inside and out side.

The inner surface of wall of the pump chambers shall be painted with plastic emulsion paint and outer surface with snowcem.

There shall be 1.20-meter wide walkway over R.C.C. columns from pump house to filter house at the same level at which walkway in filter house is provided for around the filter bed.

The pump chamber and filter house etc. all shall be kept well lighted and ventilated with natural light and excess of air through long glass panels and window as per approved drawing. The front will have glass cover where needed and have fine architectural look.

In nutshell, the water treatment plant should be so designed as to give neat modern look and pleasing architectural appearance, economical and efficient working

ELECTRIFICATION WORK

There shall be proper lighting arrangement inside and outside of all the buildings such as chemical house, filter house and pump house. Proper lighting arrangement shall also be made for clarifying units. Necessary provision for the CFL lamps, electric fans, main switches and wires etc. shall be made. The tenderer shall have to also furnish the building wise / unit wise details of electric works to be provided.

Water Supply Works

Applicable Codes

The following standards and codes are made a part of this document. All standards, codes of practice referred to herein shall be the latest editions including all official amendments and revisions.

IS : 210	:	Specification for grey iron castings
IS : 269	:	Specification for ordinary and low heat Portland cement
IS : 383	:	Specification for coarse and fine aggregates from natural sources for concrete
IS : 432	:	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement
IS : 456	:	Code of Practice for plain and reinforced concrete

IS : 458	:	Concrete Pipes (with and without reinforcement)
IS : 516	:	Methods of tests for strength of concrete
IS : 554	:	Dimensions for pipe threads where pressure tight joints are required on the threads
IS : 651	:	Salt glazed stoneware pipes and fittings
IS : 774	:	Flushing Cisterns for water closets and urinals (valve less siphonic type)
IS : 775	:	Cast iron brackets and supports for wash basins and sinks
IS : 781	:	Sand-cast brass screw-down bib taps and stop taps for water services
IS : 783	:	Code of practice for laying of concrete pipes
IS : 1068	:	Electroplated coatings of nickel and chromium of iron and steel
IS : 1077	:	Specification for common burnt clay building bricks
IS : 1172	:	Code of practice for basic requirements for water supply, drainage and sanitation
IS : 1786	:	Specification for high strength deformed steel bars and wires for concrete reinforcement
IS : 1239	:	Mild steel tubes (Part I) and mild steel tubulars and other wrought steel pipe fittings (Part II)
IS : 1536	:	SUBMERSIBLEly cast (spun) iron pressure pipes for water, gas and sewage
IS : 1626	:	Asbestos cement building pipes, gutters and fittings (spigot and socket types)
IS : 1703	:	Copper Alloy float valves (horizontal plunger type) for water supply purposes
IS : 1726	:	Cast iron manhole covers and frames
IS : 1729	:	Sand cast iron spigot and socket soil, waste and ventilating pipes, fittings and accessories
IS : 1742	:	Code of practice for buildings drainage
IS : 2065	:	Code of practice for water supply in Buildings
IS : 2116	:	Specification for sand for masonry mortars
IS : 2212	:	Code of practice for brickwork
IS : 2250	:	Code of practice for preparation and use of masonry mortars
IS : 2326	:	Automatic flushing cisterns for urinals
IS : 2470	:	Code of practice for design and construction of septic tanks (Parts I & II)
IS : 2556	:	Vitreous sanitary appliances (Part I to Part XV)
IS : 2963	:	Specification for copper alloy waste fittings for wash basins and sinks
IS : 3306	:	Specification for chemically resistant glazed stoneware pipes and fittings
IS : 3025	:	Method for sampling and test (Physical and chemical) for water and waste water (Parts 1 to 44)
IS : 3311	:	Waste plug and its accessories for sinks and wash basins
IS : 5455	:	Specification for cast iron steps for manholes
IS : 4127	:	Code of Practice for laying of glazed stoneware pipes
IS : 3495	:	Methods of tests of burnt clay building bricks
IS : 4111	:	Code of practice for ancillary structures in sewerage system manholes
IS : 5382	:	Specification for rubber sealing rings for gas mains, water mains and sewers
IS : 5329	:	Code of practice for sanitary pipe work above ground for buildings
IS : 5434	:	Non-ferrous alloy bottle traps for marine use

TECHNICAL SPECIFICATION FOR ELECTRICAL - MECHANICAL PLANTS, EQUIPMENTS AND ACCESSORIES

ELECTRICAL - MECHANICAL PLANTS, EQUIPMENTS AND ACCESSORIES

1 INTENT AND REQUIREMENT

Intent

The intent of the tender is to select, manufacture, testing at Manufacturers' works, supply and delivery in duly packed condition F.O.R project site, installation, commissioning of SUBMERSIBLE type pumping sets with accessories to be installed in pump house along with other equipments, field testing, operation and maintenance etc. as per the technical specification and other terms and conditions.

SCOPE OF ELECTRICAL & MECHANICAL WORKS

The Scope of Work covers selection, manufacture, testing at manufacturer's works, supply and delivery to store at project site properly packed for transportation on F.O.R site basis, receiving at store and site including loading and unloading at all terminal points, safe storage, installation, pre-commissioning activities, trial run, commissioning, field testing, operation and maintenance for a period of 01 month of the plant with all associated equipments and ancillaries.

It is responsibility of Bidder to have thorough understanding of reference document, site condition and specifications. The intending tenderer shall be deemed to have visited the site, studied the condition, collected relevant and required data before submitting the bid to make the bid complete and correct in all respect. Non – familiarity with the site condition will not be considered a reason either for extra claim or for not carrying out the work in strict conformity with the specifications / acts / code of practices / rules and regulations of local Electrical inspector.

Tenderer shall be responsible and assist client in obtaining all statutory clearance as required from Statutory Authority.

The contractor shall assume full responsibility to make the project complete perfectly keeping the intent and requirement of the project in mind.

The tenderer shall furnish with the technical offer, the detail system head calculation. The tenderer in their technical offer shall clearly mention the 'Make' of the equipments they shall offer for the job. Detail technical information, brochure, literature and specifications shall also be submitted with the offer. Since the tender is a complete package of Electromechanical works and the tenderer may not be essentially the reputed pump manufacturer or manufacturer of well repute for other major components like Motors, H.T. / L.T. Boards, Control and Instrumentation panel, capacitor Bank etc. The tenderer along with the technical offer, shall have to furnish a back to back guarantee from the respective manufacturers of major components as per annexure / line of confirmation to this effect.

However the guarantee from the manufacturers' will not relieve the contractor from their responsibility of executing the job successfully as per intent, terms and conditions of the tender. The drive and the driven unit shall be considered as one composite item and the performance of the whole composite item should be guaranteed for.

SALIENT FEATURES FOR INSTALLATION OF PUMPING MAIN

The SUBMERSIBLE pump sets shall be over floor surface discharge (Except submersible pump) type and shall be installed on the pump house deck. The pumps and motors shall have a common foundation at the deck. The pump house shall provide the drive motor along with individual pump delivery branches, valves, specials & common manifold, local emergency stop switches of the pump motors and valve actuators etc. All the , Starters, Capacitor Bank, earthing system etc. shall be housed within the pump house itself at the rear end of the pump house over an elevated platform. There shall also be a provision for extension of the L.T. electrical system with future L.T. equipments, cable and earthing as per future requirement. The layout drawing of the said building with tentative indications of the equipments to be installed therein is enclosed. The dimensions of each equipment like L.T. board, local push stop switch etc. shall have to be furnished by the tenderer and the same are to be incorporated in the respective positions in the drawing. While fixing the positions of the respective electrical equipments the statutory clearance as per the I.E. (Indian Electricity) act and Rules are to be maintained and shall be shown clearly in the drawing.

The tenderer shall furnish the details of the foundation of the pump motor sets from the pump manufacturer. Similarly the equipment load data as may be required for civil construction shall also be arranged by the contractor from the pump manufacturer. The offered pumps motors and other equipments shall match the stated requirements (foundation plan, total available floor area, minimum height of crane with minimum hook clearance over floor etc.) as shown in the layout drawing and a line of confirmation for the same shall be furnished with the technical offer.

The L.T. Power, control and signal cables from the respective switch / breaker / electrical outlets shall be partially within metallic tray / hangers in the pump house enclosure. All cable laying, supply, fixing of cable trays / hangers as required shall lie in the scope of this job.

The tenderer shall also furnish the details of foundation of the electrical Panel Board, pipes, valves and special etc. The tenderer are advised to give a confirmation on clear term that the layouts are acceptable to them fulfilling all technical requirements of their offered equipments. The equipment layout details, data etc. are to be clearly incorporated in the layout drawings by the tenderer and are to be submitted along with the offer.

INFORMATION TO THE TENDERERS TO WORK OUT THE SYSTEM

I. (a) Liquid : Raw / Clear Water
(b) Temperature : Approximate 7°C to 30°C

(c) Specific gravity : To be considered 1.025

(d) P_H value : 7 to 7.5

TECHNICAL SPECIFICATION OF THE SUBMERSIBLE PUMPS AND PUMPING MACHINERY

Codes and Standards

The design, material, construction, manufacture, inspection, testing and performance requirement of SUBMERSIBLE pumps shall comply with all applicable codes and standards:

Submersible PUMPS:-

Submersible pumps for cold and clear water having the following specification should be clearly mentioned as under: (As per latest IS Codes)

1. Pump make & model
2. Discharge in lpm
3. Total Head in mts.
4. No. of Stages.
5. Speed in RPM.
6. Size of suction in mm.
7. Size of Delivery in mm
8. NPSHR in mts.
9. Approx. shut-off head in mts.
10. Motor recommended (H.P.)
11. Characteristics Curve for the pump performance

In absence of such information, curves, drawings of the tenderers may be considered as technically invalid and rejected.

A. General parameter:-

The pump shall be Submersible capable of developing required total head at rated capacity for continuous operation. The pump shall have all standard required fitting etc. complete coupled by means of a flexible coupling to a horizontal foot mounting type suitable H.P. Squirrel cage induction motor fitted with the standard fitting etc.

The Pump offered should be such that the duty condition of the individual pump will be to the left of the Best Efficiency Point (B.E.P.)

Pump shall run smooth without vibrations and undue noise, hammering. The velocity of vibration and the noise level shall be as per IS-12075 and IS-12065 with latest amendment if any.

The total head capacity curve shall be continuously rising towards the shut-off point with the highest head at shut-off head.

The pump that works at the best efficient point for specified duty condition would only be selected. However the pump should have a very good efficiency.

The temperature limit of the bearings fitted in the pump shall be specified.

B. Design features:-

The design, manufacture and performance of the pumps shall comply with all currently applicable statutes, regulations and safety codes in the locality where the equipment will be installed. The equipment shall also confirm to the latest applicable Indian or equivalent international standard.

C. Features of Construction:-

The Impeller shall be enclosed type, securely keyed to the shaft. Means shall be provided to prevent losing operation including rotation in reverse direction.
The first critical speed for the pump rotor shall be at least 30% above the operating speed.
Replaceable shaft sleeves shall be provided to protect the shaft where it passes through stuffing boxes.
Pump shall be furnished complete with flexible coupling.
Pump Impeller shall be dynamically and statically balanced.

D. Pump Performance:-

Pump shall run smooth without vibrations and undue noise. The velocity of vibration and the noise level shall be as per IS-12075 and IS-12065 with latest amendment if any.
The total head capacity curve shall be continuously rising towards the shut-off point and the highest head shall be at shut-off.
Motor rating should be confirmed at +10% & -20% of rated head.

All expenses borne by the tenderer for preparation of the tender offer shall be to his own account. No claim for payment of the same shall be entertained by the owner / purchaser.

E. Material of Construction:

For Raw Water Pump:

Body/Casing	– C.I. to IS: 210 GR FG 260 / 2%NiCI
End Cover	- C.I
Impeller-	- SS-AISI 410 / CF8M
Shaft	- SS-AISI 410
Sleeve	- SS-AISI 410

For Clear Water Pump:

Body/Casing	– C.I. to IS: 210 GR FG 260 /SG-Iron
End Cover	- C.S
Impeller	- Bronze to IS: 318 LG-2
Wearing rings (casing & impeller)	- Bronze to IS: 318 LG-2
Shaft	- SS-AISI 410
Sleeve	- SS-AISI 410

F. Guarantee and performance:

Pump efficiency shall be guaranteed to deliver required discharge for a range of head between (+) 10% and (-) 20% from the specified head. Shut off head of the pump should also be mentioned and maintained.

Note- ***The minimum continuous safe flow point and run out point should clearly be mentioned on pump performance curve. The head at + 10% of the duty point of the pump should be less than the head at minimum continuous safe flow point (MCSF). Also the head at run out point should be less than that of (-) 20% of the duty point. The bid not complying with the above is liable to be rejected.***

G. Information to be provided by the Manufacturer:

The performance data as per clause 16.4, performance curves certified and signed by the manufacture and tender for performance pump otherwise offer may be rejected.
Bidder shall submit with the technical offer, the details of calculation so as to arrive at the total head of the plumpest. The pump characteristic curves, the solo and or parallel operation curves of the pumps superimposed with the system head curves etc. as mentioned in the technical specifications of the pumps shall have to be furnished with the offer.

Schedule E should be attached with the bid as under-

01	02
Discharge	
Head	
WHP	
Pump Efficiency	
BHP at pump shaft	
Motor Efficiency	
HP Input to Motor	
KWI to motor	
BOT(KWI\WHP)	

The curves, drawings etc. shall be in English Version and shall contain the Logo of the respective Pump manufacturer duly signed by the authorized signatory of the same. The curves shall comprise the following:

BASE PLATE-

Supply of M.S. heavy duty base plate with SS Packer plate for pump and motor shall be common along with M.S. heavy duty coupling (as IS: 2062-1992) and coupling guard. Suitable holes shall be provided foundations for fixing of bolts and grouting. Foundation bolts shall be complete with nuts and washers and it should be supplied by the manufacturer of pump.

Specification of electrical equipments

TECHNICAL SPECIFICATION FOR THE DRIVE MOTORS

Codes & Standards

The motors shall be conforming to the following IS specification:

IS: 325, 2223, 1231, 4691, 2540 & IEC: 34 & 72 – AC induction motor.

Electrical System

Voltage : 415V, $\pm 10\%$

Frequency : 50 HZ $\pm 5\%$

Combined variation : ±10% AC Supply
System Neutral : Directly earthed
Design & Operational requirement

All motors rating shall be confirmed at the + 10% of rated head (–) 20% of rated head. Adequacy of motor power shall also be checked with the pump input power required during solo pump operation in the event of tripping of the other pump(s) operating in parallel. The motors shall be suitable for rotation in both directions.

Detail Particulars

The technical particulars of the motors shall be closely matched with the characteristics of the pumps. The motors shall be started with star delta starters. Other details specification of the motors shall be as follows:

Duty : Continuous

Rating : To be decided as per requirement of the driven equipment stipulated in the technical specification.

No. of Poles : 2 & 4

Frame size : As per IS / other relevant ISO / IEC standards

Mounting : Horizontal, Foot mounting (for vertical motors)

Method of starting : Star / Delta

Insulation of stator : Class – 'F' with 70° temp rise over 50° ambient winding

Starting Torque : 200% of FLT
Pull out Torque : 250% of FLT

Starting current : Shall be limited to 300% of FLC for FASD starting with 100% voltage at motor terminals (subject to IS tolerance)

Starting time : Shall be within 10 sec

Terminal box : Suitable for PVC – Al, 3C power cables of required size.

Construction : TEFC squirrel cage.

Encloser : IP – 55 as per IS : 4691.

The motors shall deliver the rated output & accelerate the full speed with 85% of the rated voltage at the motor terminals.

Apart from the Technical offer, the tenderer shall furnish the enclosed data sheet duly filled in with the Technical offer.

The pump shall be directly coupled to AC three phase 415 volts 50 cycles squirrel cage, T.E.F.C. induction motor on common fabricated M.S. base plate. The motor shall be capable of operation on 415+/-10% voltage (full load slip not to exceed 4%). The motor shall be totally enclose fan cooled and of continuous rating type. The motor shall confirm to IS 325-1978. The motor shall have class-F, insulation according to SI 12741-1974. The H.P. of electric motor shall have sate margin of 10% at the maximum requirement of BHP absorbed at duty point and (+) 10 %(-) 20%of head at duty point. Rise in temperature while motor is in continuous use at rated output should not exceed as per class- F, insulation (clause 12.1 of IS 325-1978).

Dimensions and output:

1. The dimension and output of motor shall comply with IS 1231-1974.
2. Winding and insulation, The stator winding consists of synthetic enamel covered copper wire with slot insulation complying with the requirements of IS1271-1974.

3 Balance, All rotors are dynamically balanced to comply with the requirements of IS 4729-1968.

4 Performances.

The contractor shall provide the following details in a tabular from in respect of each set along with the tender:

1. Make of pump
2. Model & size of pump
3. Duties offered LPM/M
4. Manufacture
5. Efficiency of pump at D.P
6. Overall efficiency of pump set at D.P
7. Shut of head (M)
8. Head at minimum continuous safe flow (MCSF)
9. Head at maximum continuous safe flow
10. NPSHR (M)
11. Discharge at (-)20%Head (LPM).
12. Efficiency at (-)20% Head.
13. Discharge at (+) 10% Head (LPM)
14. Efficiency at (+) 10% Head
15. Input at D.P (KW)
16. Input at (-) 20% Head K W.
17. Input at (+) 10% Head KW.
18. Rated Motor output (KW).
19. Make of Motor.
20. Synchronous speed for Motor (RPM)
21. Suitability at +/- 10% Voltage.
22. Suitability at +/- 5% frequency.
23. Performance Curves.
24. Accessories.

Note- (1) The electric motor should have safe margin of + 10% at the duty point. It is also required that rating of the offered motor should be capable of driving the pump at +10% and -20% head of duty point safely.

(2) In case, motor is found insufficient, the contractor should have to provide the suitable motor as per the requirements. In such case department will not pay any extra cost to the contractor.

TRANSFORMER-

The transformer shall be oil filled, oil cooled with no load winding ratio 11000/415 V, as input supply.

Sl. No.	Particular	Unit	Specification
1	Service		Out Door
2	Make		Schneider/ABB/Kirloskar/Crompton Greaves/I.T.E
3	**Standards:**		
	Design of Transformers		As per latest IS code
	Transformer Bushings		As per latest IS code
	Transformer Oil		As per latest IS code
4	Rated frequency	Hz	50
5	Number of Phases		3
6	Nominal Voltage (Primary)	Kv	11 +/- 10% (rated value)
7	Secondary Voltage	kV	0.415 + 5% - 10% (rated value)
8	Insulation		Class A
9	Vector group		Dyn-11
10	Type of cooling		ONAN
11	Tapping	%	As per IS
12	Temperature Rise a. Oil b. Winding by resistance	 °C °C	 50 55
13	Tap changer type		Off load
14	`Terminals a. HV side b. LV side		 Bushing Cable box
15	Fittings		Lifting Hooks, Roller (bidirectional), Oil filling &draining valve, Name Plate, earthing lugs, Oil Level indicator, Silica gel breather
16	Fins		Detachable/Non Detachable type
17	Testing		Routine Acceptance Test as per IS-2026 to be witnessed by representative of Uttarakhand Peyjal Nigam
18	Alarm of Oil Temperature high		To be provided by contractor

I. Construction of Transformer Tank

a. Tank shall be fabricated from commercial grade low carbon steel sheet of adequate thickness, electricity welded and properly cleaned inside and outside. All seams shall be welded to withstand the short circuit impact without damage or distortion. The welding joints shall be stress relieved. The tank shall be rigid so as to resist any damage/ deformation due to mechanical shock during transportation or in full vacuum during filling of oil.

b. The tank shall have corrugated design for cooling of oil with detachable type fins.

c. At least two numbers ‘earth bolts’ shall be provided for connection to the earth.

Cores

a. Transformer shall be of core or shell type. The core shall be built up with high quality, non aging, silicon steel laminations of very high magnetic properties.

b. Core legs and yokes shall be of uniform and identical cross section through-out. Adequate ducts shall be provided through the cores for liberal oil circulation. Suitable lifting devices such as the rods of core clamping plate shall be provided.

Windings

a. Transformer winding shall be manufactured from high quality electrolytic copper conductor. The insulating materials shall be of proven design, withstand impulse and power frequency voltage as per IEC 76.

b. All the leads from the windings to the terminal box and bushing shall be rigidly supported to prevent injury from vibration during transportation or short circuit stresses.

Off load tap changer

a. Off-load tap change shall be effected by an external 3 phase gang operated tap changing switch.

b. The operating shaft of the Tap changer shall be bought out of the tank/enclosure and provided with a hand wheel at a convenient height.

c. A visual indicator to indicate the position of tapping in use shall be provided.

Terminal Arrangement

HT Cable Connection

- H.V terminals of the transformer shall be brought out through top lid to HT bushings for an HT lead with sealing kits and insulated boots.

LT Bus Connection

- LV three phase terminals suitable for bus bars connection to be done on the LT side; shall be brought out suitably to receive bus bars of appropriate section and size. Enough spacing shall be provided for proper termination of the bus bars sections.
- LT Neutral shall be brought out separately through a bushing mounted on the enclosure. This neutral shall be connected to 2 Nos. of earth station for neutral earth through GI strips of adequate size (min. 4X40 mm).

Earthing

- Neutral of the transformer shall be connected to two separate and distinct earth stations through double run of GI tapes of suitable size. The body of the transformer shall be provided with effective earth through double run of GI Strips of suitable size as per NEC, the drawings and specifications.
- **Pre-Commissioning Tests**

The following pre-commissioning tests shall be carried out on the transformer:

- General inspection of bolts, nuts, gaskets and checking of all accessories.
- R values on HV and LV windings shall be tested with 1000 V DC Meggar.
- Voltage ratio on each step of Tap Changer to be checked.

Testing

The successful bidder will have to get the transformer and accessories inspected as per latest edition of IS: 2026 by a Engineer authorized by the department, in his workshop/ factory before dispatch. Bidder shall submit all the test certificates as per IS/BIS at the time of inspection. All the test facilities etc. during inspection shall be provided by the bidder.

Transportation and Insurance

The delivery of the equipment safely on site shall be the responsibility of the bidder and the transportation charges shall also be born by the bidder.

Installation & Commissioning

The successful installation and commissioning of the transformer, including cost of all consumables on site shall be the sole responsibility of the bidder.

Electrical Inspection

After completion of work, the contractor has to submit completion report along with test certificates. The inspection by the Central/ State Electrical inspector shall be the responsibility of the contractor. The contractor/ firm shall be responsible for carrying out any modification/ rectification as may be required by the Electrical inspector. However electrical inspection fees shall be deposited by the department.

Completion Drawings

The firm shall provide two complete set of drawing / document immediately after
Completion of the work as detailed below:

a) Installation drawing giving complete details of the entire equipments including foundation.
b) Line diagram of the power supply/ distribution through substation.
c) Equipments, cable & bus bar trucking entry points.
d) Electrical drawing giving switch gear capacity, protective fuses, control wiring.

Fencing of Transformer plinth-

Fencing of Transformer plinth should be done with M.S net of size 3"X1" welded on M.S angle (40mmX40mmX5mm) and supported with M.S strip (1.5" width) bolted on M.S Pipe (2"X2") of 10 feet length including grouting, painting and fixing of danger plate complete with supply of all material, labour, T&P etc. as required

Starter:

1- Fully Automatic Transformer Starter (A.T.S.) –

Push button operated, floor mounted, indoor type complete with necessary instruments, suitable to operate on 415 + 10% volt, 3 phase, 50 C/S A.C supply provided with 60%, 70% and 80% tapping suitable for above motor, provided triple pole air break type contactor with star- delta, over load and under voltage protection, door switch, limit switch with complete internal connection by copper wire. The incoming and outgoing terminal of starter should be of copper strip having suitable size including sufficient space for cable connection (Incoming and Outgoing). The starter confirm to as per latest IS codes suitable to operate above motors.

Note – In case of oil cooled starter the bidder will have to supply appropriate class of oil for first filling of starter.

Switches/MCCB' s/MCB's/ACB.s

The **air circuit breaker** shall be 3 pole, 415 Volt, 50 Hz AC horizontal manual draw out type, front operated with thermal magnetic release type for adjustable over current, short circuit protection with all required protection. All ACB should be provided with extended customized bus bar of suitable size as per cross section and no of cables to be connected in out going or incoming.

The **moulded case circuit breaker** shall be 3 pole, 415 Volt, 50 Hz AC with **thermal magnetic/microprocessor** based protection released and 16/25/36/50/70 KA breaking capacity with adjustable protection for over load and short circuit confirming to IEC 60947/IS 13947 part 2/1993 latest version. The MCCB should have Ics = 100% of Icu for short circuit breaking capacity of minimum 16/25/36/50/70 KA (RMS) respectively at 415 Volt 50 Hz A.C. The MCCB shall have spreader links and barriers as standard features of manufacturers.

Panel mounting switches/MCCB's/MCB's/ACB's suitable for 415 volts 50 Cycles 3 phase AC supply with operating mechanism handle to IS : 13947 (Part -I & II) 1993/IEC 947

Note: All the material of rating as per the technical specifications & approved make)

a. Fix contact
b. Terminal & Banking Plate for terminal
c. moving contact assemble.
d. Archute & bridge.
e. H.R.C. fuses.

MCCB's/MCB's
a. Fix contact
b. Terminal & Backing Plate for terminal
c. Moving contact assembly
d. Archute & bridge.
e. Thermal /Electronics Trip system adjustable of S/C. O/C.
f. The operating handle shall have suitable indication of
ON - OFF –Trip.
LT, ACB's
LT ACB conforming to ISI 13947 (Part I & II) 1993, 3 pole/4 pole interlocked, horizontal draw out type manually operating each – complete with following:
a) Under Voltage release.
b) Shunt trip.
c) 4 Nos (NC+NO auxiliary Contact)
d) Hand trip
e) ON & OFF indicators.
f) Neutral Link.
g) Draw out system (In MDO ABC only).

Voltmeter:-

Volt meter shall be provided on incoming of each panel with 3 way and off selector switch instead for each pump as per IS 1248.
(Note: All the material of rating as per the technical specifications & approved make).

Ammeter:-

Each pumping set shall be provided with amp-meter with single CTS for suitable range of motor amp. and provided one No. Amp meter on incoming of each panel with 3 way and off selector as per IS 1248.
(Note: All the material of rating as per the technical specifications & approved make).

Indication :-

The three indications with control fuses in the incomer of LT panel RYB (Note: All the material of rating as per the technical specifications & approved make).

Voltage Drops :-

In motor circuit the conductor shall be so chosen that the voltage at the terminal of motor when running under full load condition is not less than 90% of the voltage at the main bus bar.

Automatic Power Correction Device.

Aluminium can bio degradable soft resin filled 440 Volt power capacitor confirm to IS 13340-1/IEC 60831-1 & 2, ISI mark compact design with self heeling metalized poly propylene film and over pressure device for disconnection.

The Capacitors of suitable capacity with unit of (specified in schedule no.
1) KVAR each 400/440 volts Ac with copper bus bars, HRC fuse, MPP Cap. Arranged in such a way operation of APFC Relay that the capacitors of appropriate capacity comes in operation automatically ON/off by APFC Relay when motor runs and power factor goes down to improve the power factor with specifications.

(Note: All the material of rating as per the technical specifications & approved make).

Voltage	400/440 Volt AC
Frequency	50 Hz
NO. of fuse	3
Insulation level	3000 volt AC
Equipped with internal fuse	Provided in the form copper wire Externally provided with discharge resister
Operating Conditions	AS per is 3834-1986 revised.

Electrical Wiring including HT &LT Cable :-

1 : Supply of copper conductor flat submersible cable of suitable size 1.1 KV Grade as per IS- 694:1990.
2 : Supply of XLPE/PVC Insulated (3 / 3½) Core Aluminum conductor armoured, PVC Sheathed power cable 1.1 KV Grade as per IS 7098(part-1)/ IS 1554(part-1).
3 : Supply of XLPE/PVC Insulated 3-core Copper conductor armoured, PVC Sheathed power cable 1.1 KV Grade as per IS 7098(part-1).
4 : Danger Notice Plate as per IS- 2551
5 : Earthing installation provide at each pumping station. protective conductors shall be provided for all electrical installation and associated mechanical plant. as per requirement of IS-3043 or equivalent. the earthing system shall be designed for the earth fault current occurring at the point of supply.
Other acceptable standards like HIS / ISO etc. which may be equivalent and or superior to those specified above.

Pressure gauge (IS 3624):

The delivery of all the Pumps and Pump common header shall be provided with Dial type pressure gauge of suitable range complete with copper tubes and control cocks. The gauges shall be of direct mounting SS diaphragm sealed type. The dial size of each pressure gauge shall not be less than 100 / 150 mm. The M.O.C. shall be suitable for storm / raw water pumping installation. Each pressure gauge shall be complete with snubber of suitable class of enclosure. Accuracy shall be + / - 1 % of full scale range or better. Scale range shall be selected so that normal system pressure is approximately 50 % of the full scale.

Specification:

Type	:	Top mounted (directly) diaphragm sealed type.
Reference standard	:	IS 3624
Range	:	As per annexed site requirement
Dial size	:	100 / 150 mm.
Accuracy	:	+ / - 1 %
M.O.C.: Dial Flanges Internals	 : : :	 Cast Aluminum SS 316 SS 304
Enclosure	:	Weather proof IP 65.
Accessories With M.O.C	:	Snubber, 2 way cock of SS 304

EARTHING

Earthing of Transformer

- Neutral of the transformer shall be connected to two separate and distinct earth stations through double run of G.I tapes of suitable size. The body of the transformer shall be provided with effective earth through double run of G.I Strips of suitable size as per NEC, the drawings and specifications.
- NOTE- Pumping Station where 2 Nos. Transformer are proposed, 8 Nos. earthing station (2 Nos. for neutral of transformer, 2 Nos. for transformer body and 2 Nos. for pumping plant) and where 1 No. transformer proposed 6 Nos. earthing station (2 Nos. earthing for neutral of each transformer, 2 Nos. for transformer body and 2 Nos. for pumping plant) will be constructed by the contractor.
- **Earthing of all other installation-**

Double loop earthing of all electrical equipment including supply of G.I earth strips, G.I earth plates, GI boxes, funnel, pipe etc as required as per latest IE rules will be carried out by the contractor, including digging of pits, filling of Charcoal and Salt in pits complete in all respects. (As per I.E rules)

The total installation shall be effectively earthed and shall conform to IS: 3043. Each earth station shall consist of twin G.I. pipe each not less than 3 M long, Class – B medium of suitable dia (as decided by engineer incharge) placed at the bank of the reservoir at suitable location. The top portion of the earth electrode shall be properly brick pitched.

All earthing system shall be designed to ensure effective operation of protective gears in case of earth faults. The total earth resistance at any point of the earthing system for the station shall not be more than one ohm.

For station earthing, number of electrodes to be provided for the earthing system shall be decided after actual measurement of soil resistivity at the location. After installation, actual earth resistance shall be measured and if required, additional electrode to be provided for achieving the desired values. No. earth ring shall have less than 2 earth electrodes.

H.O.T. (Hand Operated Travelling) GANTRY CRANE

A- Raw water/Intake- Chain pulley block along with traveling arrangement of required capacity and lift with hand chain shall be provided in the pump house for M & R of the pumping machinery, particularly for handling of pump & motors located in the pump house. The span, lift & other parameters of the crane shall be closely matching with the requirement and layout of the pump house.

B- Clear water/MPS/IPS- One H.O.T. gantry crane with chain pulley block shall be provided in the pump house for M & R of the pumping machinery, particularly for handling of pump & motors located in the pump house. The span, lift & other parameters of the crane shall be closely matching with the

requirement and layout of the pump house. The gantry shall be of single / double girder construction and traveling track of the crane shall including 2 sides girders as per design suitable for the load as described in site requirements. MS bars to support the gantry and span as per pump house size with hand chain suitable to operate from floor of pump house complete in all respects. The crane shall consist of long travel trolley and the gantry girder shall be suitable for movement of cross travel along with hoisting block.

Hand chain: - The length of hand chain for the travel trolley and cross travel of H.O.T crane shall be such that the lowest point of suspended loop shall stand at least 500mm above the operating floor level. Hand chain wheel shall be flanged and guides shall be provided to prevent coming out or jamming out of chain.

Bearings: - All bearings to be fitted with H.O.T crane and Chain Pulley Block shall be pre lubricated and sealed type or provided with filling and seals for pressure lubrication.

The crane and gantry structure shall be degreased, cleaned and all rust, scales, sharp edges removed and treated with one coat of primer and finished with two coats of final paints as per specification.

The following documents are to be furnished by the contractor after award of the work: -

G.A. Drawing of crane with all details from the manufacturer.

VALVES & SPECIALS FOR PUMP INDIVIDUAL DELIVERY & COMMON HEADER / MANIFOLD PIPING

Cast Iron Gate Valve:- Shall Confirm latest IS and relevant codes.

Sluice Valve – The gate face ring shall be securely pegged over their full circumference. Operation gear of all valves shall be such that they can be opened and closed by one man against an unbalanced head 15% in excess of the maximum specified rating. all hand wheel shall be arranged to turn in clock wise direction for opening and anti clockwise for closing. these directions shall indicated on the hand wheels. Perfect interchangeability of components, parallelism between side flanges and equal taper between wedge faces shall assured. Valves shall be perfectly machining and pressing of body and wedge rings, Excellent finish on spindle threads resulting in low friction and smooth operation of valves and Long service life and leak-tightness.

Material of construction

Body / Wedge / Dome – C.S. as per IS: 1030 / ASTM A216 Gr WCB.

Body / wedge / ring - Leaded Tin Bronze as per IS: 318

Spindle – SS as per IS: 6603 Gr.12Cr12

Stem nut / back seat bush - Leaded Tin Bronze as per IS: 318

Parameter :-

Type – Rising Spindle

Nature of Operation – Horizontal / Vertical

Applicable Code – IS 14846

Flange Drilling Standard – As per IS : 1538

Reflux Valve – Shall poses high speed closing characteristics and be designed for minimum slam condition while closing. external counterweight are not acceptable. Perfect interchangeability of components, parallelism between side flanges shall assured.

Material of construction

Body / Disc / Cover – C.S. as per IS:1030/ ASTM A216 Gr WCB.

Hinge - C.S. as per IS:1030

Hinge pin – SS AISI 316

Body Ring - SS AISI 304,316,410
Parameter :-
Type – Single plate.
Nature of Operation – Automatic
Applicable Code – IS 5312
Flange Drilling Standard – As per IS : 1538
Note :-

A- For various ranges of head flange thickness should be consider as under.

1- upto 200 mtr. Head - 20mm
2- From 200 mtr, Upto 400 mtr. Head – 25mm
3- From 400 mtr upto 600 mtr. Head- 28 mm
4- From 600 mtr upto 900 mtr. Head- 32 mm

B- In case of pipe and pipe fittings thickness of pipe should be considered as follows.

1- For 200mm dia pipe - 8 mm
2- For 150mm dia pipe - 7 mm
3- For 100mm dia. Pipe - 5.4 mm

TOOLS & TACKLES

The tenderer shall include in his offer for special tools, tackles and accessories for normal operation and maintenance of the equipment. The list of tools and tackles considered shall be indicated in the offer as per enclosed list.

A	Grease gun of required capacity
B	DE Spanner set. (10-12 to 36-40 all sizes)
C	DE Ring spanner set. (10-12 to 36-40 all sizes)
D	Screw driver.
E	Insulated Pliers
F	Adjustable wrench 150/200 mm dia.
G	Tool Box
H	Heavy duty Bearing Puller suitable for bearings of pump & motor.
I	Crimping tool (Hydraulic or Manually operated 35 sq mm to 1000 sq mm capacity)

GUARANTEE

All the equipments shall be guaranteed against defective design, material, manufacture and or workmanship for a period of 18 months from date of dispatch or 12 months from the date of commissioning whichever is earlier. The contractor shall be responsible for complete operation and routine as well as break down maintenance of the installation including supply of all spares and consumables (except HRC fuse & lamps) during the guarantee period of one year and the cost shall be included in the offer. No extra amount will be paid on this account.

INSPECTION AND TESTING

All materials, casting used for manufacturing of the pumps with allied equipment shall be of best tested quality and the contractor shall submit the test certificates for the MOC at the time of supply.
Ultrasonic tests on shafts are to be conducted and the test certificates for the same shall be furnished.
Dye – penetration test to the impellers are to conducted and the test certificates shall be furnished with the supply.
Dynamic balancing of the impeller, coupling etc. are to be conducted and the test certificates to be furnished.
Hydrostatic test at neither a pressure nor less than 150% of the shut off pressure is to be conducted for duration of not less than 30 minutes and certificates of such tests is to be furnished.
Radiography for impellers and casing shall be conducted and the certificates to be furnished.

Pump performance tests of pump sets for head, efficiency and power consumed in presence of the department's representative. The performance tests shall be conducted with the job motor and preferably with full column setting. The tenderer shall indicate with the confirmation from the pump manufacturer the maximum column setting, they can accommodate in their factory test bed. The minimum submergence required test shall be conducted to at least one pump set. Vibration analysis to all pumps and motors, are to be made in all load conditions both during shop testing as well as at site during commissioning. The duration of shop testing shall be not less than 8 hrs. Continuous operation for each pump motor and temperature monitoring of both pump and motor shall be conducted. After performance test, at least one pump set shall be stripped off and internal components shall be checked as per choice of the departmental representative.

The contractor shall give char 15 days notice to the purchaser / owner prior to witness testing at the manufacturer's shop.

PACKING FOR TRANSPORTATION

All parts shall be properly boxed, crated or otherwise protected for transportation and handling. Exposed machine finished surfaces shall be thoroughly greased before packing.

The Bidder shall fill up the check list and submit with the offer.

INSTALLATION AND COMMISSIONING –

Under This item Installation of all above supplied pumping plants with accessories inside and outside the pump house and carry out the power wiring and earthing work is required.
All the equipments shall be installed at site following the test engineering practices and the direction of the authorized representative of the employer observing all recommendation and guide lines of the respective equipment manufacturers and obeying all statutory rules, safety regulations, IE rules and acts etc. Appropriate tool and tackles as would be required for proper installation / erection work shall be used.
The installation work shall include supply erection, grouting of all foundation bolts, nuts, washers, channels, machine plate, wages, supports etc. as would be necessary for the foundation, leveling, alignment etc.
Commissioning –
After completion of the erection works, the equipment have to pass through the statutory and pre-commissioning test shall arrange, then the equipment shall be put in to trial run operation processing from no load to full load condition. During trial run operation, checking all mechanical rigidity,

alignments, clearance etc. shall be made by contractor with proper readjustment if necessary. The plants and equipments shall also undergo for continuous operation at normal full load including operation at different working duty points. Checking and testing of the indication and control system of the instrumentation in the control panel shall also be conducted.

During the trial run operation the equipments shall also have to pass through all field tests and field performance tests. Entire trial run process or testing activities shall be conducted as per direction of the authorized representatives of the employer.

TESTING –

Under this item testing of pumps against guaranteed figure of schedule E is required as following.

At manufacturer works:

Testing of Pumps and transformers at manufacturer works in presence of authorized representatives of employer before packing and dispatching shall arranged by tenderer as his cost offered in tender.

At Site:

Testing of all equipments as per specification and standards at site shall be conducted as per direction of the authorized representatives of the employer.

PAINTING –

Under This item painting of entire pumping plants with accessories with two coat of super enamel paint as per standard and instruction of engineer in charge is required. (as per **IS-101** with latest amendments.)

VCB-

HT panel with one no 630 amp VCB module for incomer and 02 nos load break switch module for outgoing to transformer complete.

5.12 Detailed Specification for AMR Water Meter– 15 MM to 40 MM (Multi-jet)

5.12.1 Specifications

All AMR Water Meters shall be manufactured as per ISO 4064 standards & have International Organization of Legal Metrology (OIML)/MID pattern approvals & shall bear EEC marking on dial of water meter for each size.

1. The water meters of domestic sizes shall be equipped with RF based AMR technology, inbuilt / directly fitted on the water meter & wireless, multi-jet, inferential type, dry dial, MID approved water meters.
2. Water meters of each size should have been duly tested and passed as per the relevant standards and specifications from Fluid Control Research Institute (FCRI) Kerala for performance test supported with test certificate.

5.12.2 Applicable Standards:

Water meters straight means-15 mm size domestic water meters, inferential type, multijet ,magnetically coupled, having dry dial Class-'B' standard with OIML/MID certification mark shall be with protection class of IP-68.

The meters shall be supplied complete with GI fitting ,brass nuts and brass nipples. Strainer & sealing shall be provided as per relevant IS provision.

5.12.3 Markings on The Body Of The Meter:

(a) Markings on the Body of the Meter:

All water meters shall have following markings on dial/ cap.

i. Class "B"

ii. Multijet/ Model Name
iii. Magnetic Type
iv. As per ISO: 4064-1993.
v. MID/OIML Code No.
vi. Make/Brand
vii. Sl.No. / Year of Manufacture.
viii. TMC

(b) Embossing /engraved on meter body:

i. Size

5.12.4 Direction of flow of water on both sides of the body of meter

5.12.5 Material of construction:

- The manufacturer shall provide specific details of materials used for various parts of the meter which must meet the specifications for the material of construction of the individual parts of the meters as per IS 779:1994 (latest amendments) or ISO 4064: 1993.
- The body of the meter shall be of either Brass or Bronze. The firm shall specifically mention in the offer, the metal used in manufacturing. Material that come in contact with the water supply shall withstand 2 ppm (parts per million) of chlorine residual in the water supply and shall be resistant to corrosion.
- The water meter and accessories shall be manufactured from materials of adequate strength and durability. The materials, which come in contact with the potable water, shall not create a toxic hazard, shall not support microbial growth, and shall not give rise to unpleasant taste or discoloration in the water supply.
- The spindle and bearings inside the hydraulic chamber shall be made of polished stainless steel with hard metal tip/ sapphire.
- The internal pressure cup shall be made of low –ferrous brass not exceeding 0.02% Fe contents/Engineering plastic. Furthermore the internal pressure cup should overlap the meter body. Engineering plastic. The lower case of the meter shall be painted with thermal painting externally. The painting materials should be safe for human uses and not affect human health. (Health certificates should be included in the bidding order of award).
- Meter will be provided with monolithic seal with copper/SS wire or Rust proof sealing wire
- Variation in weight of the meter will be permissible to +5% of the weight indicated by thr bidder in his technical bid.
- Each meter should be supplied in separate individual box with its accessories and test Certificates and guarantee card for free repair /replacement for duration of 5 years.The no. Of individual boxes of meters shall not exceed 30 nos in each cartoon.
- Minimum three meters shall be sent for testing at FCRI frpm each batch of supplied meters before installation at site.

5.12.6 Requirements for Totalizer and Totalizer Shield:-

The Totalizer shall be designed in such a way if the Totalizer protective glass is broken for a reason or another the Totalizer cannot be removed from its place. The Totalizer protective cover shall be made of sturdy glass and shall have a thickness of not less than 5mm and shall pass specified tests. Sturdy glass is defined as the ability of the counter protection glass of withstand without damage, a free fall of a metal ball weighing subject to clear visibility till end of contract period guaranteed by bidder may be allowed.

5.12.7 Totalizer :-

- It shall be of straight reading type
- The totalizer shall register in cubic meter units
- The initial totalizer reading should be less than 1KL
- The totalizer shall consist of a row of minimum five on-line consecutive digits to read at least 99,999 m^3 KL. Another two digits shall register flows in submultiples of Kilo litres and should be of a different colour.
- Another three digits or pointers shall register flows in liters and be of a Different colour.
- The totalizer should be of closed type.
- The totalizer must be suitable for test on an electronic test bench.
- Totaliser shall be made of copper CAN having 5mm thickness mineral glass or any other suitable material required to maintain IP 68 protection class
- Meter will be provided with monolithic seal with copper wire

5.12.8 Strainers :-

- A full range of strainers will be available in sizes compatible with the meters and will have the same general specification as the water meter.

5.12.9 Marking :-

Each water meter shall be marked with the following information

- Direction of flow of water on both sides of the meter.
- Serial number.
- Manufacturers name.
- Year of manufacture.
- EEC/OILM/MID Mark.
- Nominal Flow Rate

5.12.10 Meter Characteristics:-

- The meters performance specifications shall be to ISO 4064 Class B performance.
- The meter offered will be able to meet the performance specifications laid out in the following table.

5.12.11 Technical Specification of Dirt Box with S. S. Strainer

- The Dirt box shall be made of materials, which are not susceptible to electrolysis, corrosion and non toxic . The cover shall be fixed with the help of hinged bolts, nuts with rubber gaskets/packing for easy removal of the strainer basket and quick cleaning of dirt . The dirt box shall be of sufficient size and design to trap the silt and foreign materials so that the frequency of cleaning the strainer and dirt box is minimum/ optimal.
- The strainer basket shall be of rigid special web design made of stainless steel with perforated punched opening which provided largest possible area of filter element with minimum head loss .
- The strainer with dirt box shall be of doubled flanged flat machined faced type and details of the flanged shall be similar to that of water meter type WOLTMAN. The internal diameter of the strainer shall be same that of the corresponding meter.

5.12.12 Strainer Materials

- Body: C.I. IS:210 FG 200
- Strainer Frame : SS Perforated Sheet, SS 304
- Mesh (30) : SS Perforated Sheet, SS 304
- Gasket : Rubber
- Cover : C.I. IS:210 FG 200

- Stud / Bolts / Nut : IS:1363CL4.6 & CL4.0
- Eye Bolt : IS:1363CL4.6 & CL4.0
- Plug : 13% CR. SS (AISI 410)
- Flange Dimensions as per IS:1538 table 6/BS-4504 PN16

5.12.13 Hand Held Unit / Device (HHU)

1. The hand held device or reading device shall have the sufficient memory (minimum 4000 reading data) for storage of maximum data / reading along with sufficient power back up.
2. The HHU shall have the onsite search facility, to locate the exact physical location of water meter in particular area and to obtain the corresponding details of it. The PC should be connected via USB to HHU. The readout device and HHU should have USB port to connect with computer device for exchanging the data.
3. The HHU should be adjustable back light, sun light readable, colour display and touch screen.
4. The HHU shall have minimum 64 MB flash memory and 128 MB RAM.
5. The battery of HHU device shall give power back up for at least 5 hours continuously.
6. The unit must be able to withstand three foot drop on concrete.
7. The handheld must be ergonomically designed to be comfortable for handheld meter reading.
8. There must be audible beep when indicating key has been pressed, there must also be an auto repeat function on keys and a rapid response between keying and seeing results on the screen.
9. The handheld must come with an integrated intelligent fast charge capability that allows lull charge within 5 hours.
10. The hand-held must have integration with Global Positioning System (GPS) for route monitoring and configuration.
11. The read-out device should be connected to the Hand held device and needs to be USB powered.
12. The quantity of HHU in BOQ has been considered @ 1 HHU on every 25000 AMR water meters which may vary at the time installation based on capacity of HHU and location/cluster size of meters .Bidders has to quote item rate for HHU.
13. Since HHU integration for route monitoring and configuration is required, bidder should adopt off field method. However field experience should also be utilized to optimize the grouping of meters. HHU should also have the facility to create route, modify route on site and to arrange in desired sequence as per site conditions.
14. HHU should be a single unit with required storage capacity and capable to receive required data from already defined numbers of installed meters through radio frequency and to download the same to the base computer.
15. HHU shall have atleast 3 different level of security or as directed by Engineer-incharge.
16. In case of AMR reading, if reading is not captured due to some reason, HHU should have capability to record data manually along with route data to be downloaded with notification of cause of manual reading. The issue should be resolved within 15 days and no manual reading will be allowed. Next billing cycle meter will be treated as unread and will be attracted action under relevant clause for that particular meter
17. MMU should be integral part of HHU and it should be single unit.
18. HHU should not have option of editing the meter reading

5.12.14 Lab Testing:

The lab testing of wáter meters shall include following tests as per ISO: 4064:2005 standards. The same will be conducted at any approved laborator within the country as decided by the employer

i. Accuracy testing of water meters at Qn.
ii. Accuracy testing of water meter at Qn after clamping the magnet on the water meter.
iii. IP 68 testing of water meter& AMR system.
iv. Remote reading of water meter in dry i.e. open air condition.

v. Remote reading of water meter in submerged condition i.e. under water, with under variable water depth conditions.
vi. Remote reading with different tamper alarms for back flows, magnet and physical damage, etc.
vii. Response time of AMR reading on HHU.
viii. Visual inspection of AMR water meter and its AMR system along with its software.
ix. Real Index test i.e. all the time electronic index of the water meter shall match with mechanical index.
x. Demonstration of uploading of readings from hand held unit to PC and vice versa.
xi. Life cycle and endurance test.
xii. These tests should be performed in the in-house laboratory of the meter manufacturer. The Employ will depute Third Party Inspection Agency to the meter manufacturing facility of the manufacturer to inspect the matter as per QAP approved by Engineer In charge. Inspection charges and all other charges shall be borne by the contractor.

5.12.15 Field Testing:

All requirements of field testing/demonstation are also necessary for main work and same listed in main work are also to be demonstrated in field as pilot Project. The field testing shall include the following.

i. Remote reading of individual water meter from a maximum distance of 200metres with clear line of sight under submergence condition with lid of chamber in closed position. This test is to be conducted during field demo as well as installation in main work.
ii. Remote reading of individual water meter from a maximum distance of 100metres with obstruction of any structures under submergence condition with lid of chamber in closed position, with walk by mode.
iii. Remote reading of grouped /routed water meter from a maximum distance of 150 meters with clear line of sight under submergence condition with lid of chamber in closed position, with walk by mode during field demo as well as after installation in main work
iv. Remote reading of grouped / routed water meter from a maximum distance of 100metres with obstruction of any structures under submergence condition with lid of chamber in closed position with walk by mode during field demo as well as after installation in main work.
v. On site search facility in the AMR device / HHU and software.
vi. Remote reading for special cases like back flow, magnetic tamper, physical tamper, etc. and their respective tamper alarms in HHU and software.
vii. To check the backflow tampering indication on HHU screen & software along with display of its quantity and period of backflow.
viii. Auto search facility of AMR water meter at site in HHU.
ix. Data acquisition speed of AMR reading on HHU at site for individual read and for group / route read.

5.12.16 Supply & Installation of Software Required for AMR meter:

1. The software used for water meters shall give output, at least in CSV (Comma Separated Vlue).
2. The Route Management software must be capable of running on a standard PC compatible with minimum Pentium processor; in addition the software must run under Windows95, Windows XP Professional, Windows Vista, Windows 7,windows 8 and / or latest version of windows operating system.
3. The software shall allow the PC operator to review and edit any account in Route Manager database. Also, the PC operator shall be able to generate route and activity reports.
4. The software shall alert the meter reader for unread accounts in that route.
5. The software shall enable the user to specify the data to be exported from the database for transferring to billing system.
6. The software shall take routes from an existing database for loading into a reading device.

7. The software shall select the routes to be read, and assignment of routes to a reading device and dynamic updating of routes and sub-routes to be enabled.
8. The software shall upload routes from the reading device.
9. The software shall post the reading from the reading device onto appropriate accounts within the database.
10. Software shall be able to set meter status on the fly like, meter not okey, reading not reliable, meter maintenance required etc
11. Software should have a radio configuration tool which can be enable/disable meter, set/read meter status.

Billing Software:

Item include supply, providing, installing and successfully running of billing software as per the requirement of Engineer in charge.

The billing software should have flowing features as given below:-

- Fast COTS based implementation to provide rapid ROI.
- Reduces cost of total ownership.
- Reduce loss & improve revenues with proper real time data captured.
- Efficient Management dashboard with real time information & consolidated accounts.
- Improve overall operational synergy & efficient Business Intelligence Management.
- Efficient & integrated back office support.
- Solution should be scalable, flexible, end-to-end solution for the business processes in TNC that have the highest value in term of costomers, assets, service, regulations, and financials. It supports the gradual expansion and adaptation of transaction volume as well as new processes.
- Optimized meter-to-cash processes and days sales outstanding through end-to-end management of service, billing, and financials processes.
- Increased customer satisfaction and call centre efficiency using an integrated costomer service collaboration solution that automates standard service and provide fast access and a single view into all data and work history related to your customers.
- Improved efficiencies in supply operations by providing a utility wide supply operations solution.
- integrated with core back-office functions and information on customers, meters, hydrants, financials, and the workforce
- Integrated financial information using standardized processes; providing visibility on capital, operational, and third-party expenditures; monitoring project costs and regulatory risks; and integrating business performance
- Information with management processes helps better managed investment, opportunities and risks through the establishment of strategic enterprise management techniques
- Optimized procurement processes and material inventory by enabling collaboration and contracting of operational management services with suppliers, contractors, and partners, as well as streamlining corporate-wide buying processes.
- Streamlined and simplified workforce-related processes through integrated employee transaction management, workforce deployment based on skills and availability, and innovative employee life-cycle management that aligns employee talents with corporate goals.

Section VII - General Conditions of Contract

The Conditions of Contract, read in conjunction with Part II Particular Conditions of Contract and other documents listed therein, should be a complete document expressing fairly the rights and obligations of both parties.

The form of Conditions of Contract that follows has been developed for smaller measurements contracts for construction on the basis of the practice of the Government of India, and considerable experience in different States in India in the drafting and management of contracts, bearing in mind a trend in the construction industry towards simpler, more straightforward language.

General Conditions of Contract

i. General

In this Agreement, unless it be repugnant to the context herein or the subject otherwise requires, these words and expressions defined below shall have the meanings assigned to them:

1. Definitions	(a) The **Accepted Contract Amount** shall mean and include the amount accepted in the Letter of Acceptance/Award for the execution and completion of the works and remedying any defects in accordance with the terms of the Agreement. (b) **"Applicable Laws"** shall mean and include all laws which are applicable to the Project and/or to the Contractor extending to the State of Uttarakhand, having been enacted or brought into force by Government of India or Government of Uttarakhand including, notifications, orders, instruments, regulations and rules made thereunder and judgments, decrees, injunctions, writs and orders of any Court or Tribunal or Authority or Forum, as for the time being in force during the subsistence of this RFP. (c) **Bill of Quantities** shall mean and include the priced and completed Bill of Quantities forming part of the Bid. (d) **Compensation Events** shall mean and include those defined in the Clause 42 of the GCC. (e) The **Competent Authority** shall mean and include the DSCL or its Chief Executive Officer or the Additional Chief Executive Officer or anybody or committee or entity constituted or any person or entity or body or committee delegated with specified limited power for specific limited purpose by the Chief Executive Officer of the employer. (f) The **Completion Date** shall mean and include the date of completion of the works as certified and declared by the DSCL or 6 months for construction work period from the date of signing of contract, whichever is later, in addition to and 5 years for operation and maintenance after the expiry of such construction work period. (g) The **Contract** shall mean this Contract Agreement, between the Employer and the Contractor to execute, complete and maintain the works and the documents listed in sub-clause 2.3 of the GCC. (h) The **Contractor** shall mean the party whose bid to carry out the works has been accepted by the Employer and the men, agents, servants, directors,

managers, consultants, sub-consultants, officers, staffs of the party whose bid has been accepted by the employer.

(i) The **Contractor's Bid** shall mean and include the completed bidding documents submitted by the Contractor to the Employer.

(j) The **Contract Price** shall mean and include the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

(k) **Days** are calendar days; **months** are calendar months.

(l) **Defect** shall mean and include any part of the works not completed or not performed or not done in accordance with the contract.

(m) The **Defects Liability Certificate** shall mean and include the certificate issued by Employer, after the Defect Liability Period has ended and upon correction of defects by the Contractor after the expiry of the Completion date.

(n) The **Defects Liability Period** shall mean and include the date on which the Defects Liability Certificate.

(o) **Drawings** shall mean and include the drawings of the works but not limited to the Contract, and any additional and modified drawings issued by or on behalf of the Employer in accordance with the Contract or instruction of the Competent Authority in writing or the Engineer-In-Charge and shall be deemed to include the figures, calculations, other information, facts, images, representations, graphical or otherwise provided or approved for the execution of the Contract.

(p) **"DSCL"** shall mean and Dehradun Smart City Limited.

(q) The **Employer** shall mean Dehradun Smart City Limited or DSCL and any of its officer, men, agents, servants, directors, managers, consultant and sub consultant as has been referred throughout this document.

(r) **Engineer** shall mean the person appointed by the Employer and responsible for supervising the execution of the Works and administering the Contract and all acts incidental as well as consequential for the proper execution of the work for which he is appointed by the employer in accordance with the terms and conditions of such appointment and who shall be treated as the Engineer-In-Charge (E in C)for the purposes of this project.

	(s) **Equipment** shall mean Contractor's machinery and vehicles brought temporarily to the Site work. (t) **"Force Majeure"** or **"Force Majeure Event"** shall mean acts, events, conditions and/or occurrences as specified in the GCC 61. (u) "**In writing**" or "written" shall mean hand-written, type-written, printed or electronically made, resulting in a permanent record; (v) The **Initial Contract Price** shall mean the Contract Price listed In the Employer's Letter of Acceptance/Award. (w) The **Intended Completion Date** shall mean the date on which it is agreed by the parties that the Contractor shall complete the works as per **PCC** including date approved by the Engineer-in charge by issuing an extension of time or an acceleration order in writing. (x) **Materials** shall mean all supplies, including consumables, used by the Contractor for incorporation in the work. (y) The **Particular Condition of Contract** shall mean the documents and other information, which comprise the Contract, specifying. (z) **Plant** shall mean any integral part of the work that shall have equipment's, mechanical, electrical, chemical, function, tools, machineries and shall include site area, land area where such things are lying and operating. (aa) **PMC shall mean** the project management consultant appointed by Employer for the job as the agreement between the employer and the PMC.The objective of PMC is specified in GCC63. (bb) **"RFP" shall mean** Request for Proposal document issued by DSCL, including all **"Tender Documents"** and "**Bidding Documents"**. (cc) The **Site** shall mean the area defined as such in the PCC. (dd) **Site Investigation Reports** shall mean those that were included in the bidding document and are factual and Interpretative reports about the surface and subsurface conditions at the Site. (ee) **Specification** shall mean the specification of the works included in the Contract and any modification or addition made or approved by the Engineer-in charge the Competent Authority, as the case may be.

(ff) The **Start Date** shall mean date given in the PCC which shall be latest date by when the Contractor shall commence execution of the works.

(gg) **Subcontractor** shall mean a person or corporate body who has a Contract with the Contractor to carry out a part of the work In the Contract, which Includes work on the Site.

(hh) **"Tax"** shall mean all tax, duty, and levy, charge whatsoever charged, imposed or levied under Applicable Laws. Payable/ leviable in respect of the said Project.

(ii) **Temporary Works** shall mean works designed, constructed, installed, and removed by the Contractor that are needed for construction or Installation of the works.

(jj) **"Tender/ Bid/"** shall means the Contractor's quoted Technical and/or Financial Proposal and detailed Proposal for the Project, including the Contractor's Proposal, submitted to the Employer and as accepted by the ultimately Employer.

(kk) **"Termination Date"** shall mean the date on which this Contract Agreement terminates by efflux of time or by issuance of a Termination Notice.

(ll) **"Termination Notice"** shall mean the communication received issued in accordance with this Contract Agreement by a Party to the other Party for terminating this Contract Agreement.

(mm) **"Termination Payment"** shall mean the amount payable by the Employer to the Contractor upon the termination of this Contract Agreement.

(nn) "**Third Party**" shall mean any Person, real or judicial, or entity other than the Parties to this Contract Agreement.

(oo) **"Transfer Date"** shall mean the day immediately following the last day of the Contract Period, including any extensions thereto or earlier termination thereof in accordance with the terms of the Concession Agreement.

(pp) **"Variation"** shall mean a modification, improvement or change in the works, services, and facilities etc to be carried out by the Contractor, such that the cost of implementing the modification, improvement or change can be recovered through a 30-day adjustment of the Contract Period.

	(qq) **"Works"** shall mean the Construction of Smart Road including Construction of Multi utility duct, Laying of Water Supply lines, Sewer lines, Drains, & other related works including Operation and maintenance for 5 years and all the appurtenances thereof, including any other permanent, temporary or urgent works required to be done for proper execution of this Agreement. (rr) " **Parties**: DSCL/Employer and Contractor hereinafter individually shall be referred to as a 'Party' and collectively as 'Parties' "
2. Interpretation	2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Engineer shall provide Instructions clarifying queries about these GCC. 2.2 If sectional completion is **specified In the PCC**, references In the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works). 2.3 The documents forming the Contract shall be Interpreted In the following order of priority: (a) Contract Agreement, (b) Letter of Award, (c) Contractor's Bid & Original Price Bid BOQ, (d) General Conditions of Contract, (e) Particular Conditions of Contract, (f) Specifications, (g) Drawings (if applicable), (h) Any other document **listed In the PCC** as forming part of the Contract.
3. Language and Law	3.1 The language of the Contract and the law governing the Contract are **stated In the PCC**.
4. Engineer's Decisions	4.1 Except where otherwise specifically stated, the Engineer shall decide contractual matters between the Employer and the Contractor In the role representing the Employer.
5. Delegation	5.1 Unless otherwise **specified In the PCC,** the Engineer may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communica-tions	6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered
7.Subcontracting	7.1 The contractor may subcontract part of the construction work with the approval of the Employer in writing, upto 25% of the contract price but will not assign the Contract. Subcontracting shall not alter the contractor's obligations. 7.2 Beyond what has been stated in clauses 7.1, if the contractor proposes sub-contracting any part of the work during execution of the works, because of some unforeseen circumstances to enable him to complete the work as per terms of the contract, the Employer will consider the following before according approval: i.The Contractor shall not sub-contract the whole of the works. ii.The Contractor shall not sub-contract any part of the work without prior Consent of the Employer. Any such consent shall not relieve the contractor from any liability or obligation under the contract and he shall be responsible for the acts, defaults and neglects of any his sub-contractor, his agents or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents and workmen. 7.3 The Engineer should satisfy himself before recommending to the Employer whether a.The circumstances warrant such sub-contracting: and b. The sub-contractor so proposed for the work possess the experience, qualification and equipment necessary for the job proposed to be entrusted to him in proportion the Quantum of works to be sub- contracted.
8. Other Contractors	8.1 The contractor shall co-operate and share the site with other contractors. Public authority's utilities and the employer between the dates given in the schedule of other contractors, as referred to in the PCC. The contractor shall also provide facilities and services for them as described in the schedule. The employer may modify the schedule of other contractor, and shall notify the contractor of any such modification.

9. Personnel	9.1 The Contractor shall employ for the construction work and routine maintenance the technical personnel named in the Section 3 or other technical persons approved by the Engineer. The Engineer will approve any proposed replacement of technical personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel stated in the Section 3 . 9.2 If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the Works in the Contract. 9.3 The Contractor shall not employ any retired Gazetted officer who has worked in the Engineering Department of the State Government and has either not completed two years after the date of retirement or has not obtained State Government's permission to employment with the Contractor
10. Employer's and Contractor's Risks	10.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.
11. Employer's Risks	11.1 The Employer is responsible for the excepted risks which are (a) in so far as they directly affect the execution of the Works in the Employer's country, the risks of war, 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), natural calamities 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.
12. Contractor's Risks	12.1 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, referred to in clause 11.1, are the responsibility of the Contractor.
13. Insurance	13.1 The Contractor shall provide, In the joint names of the Employer and the Contractor, Insurance cover from the Start Date to the end of the complete contractual obligations including the O&M Period. In the amounts and deductibles **stated In the PCC** for the following events which are due to the Contractor's risks: (a) loss of or damage to the Works, Plant, and Materials [which are Incorporated In works]; (b) loss of or damage to Construction Equipment; (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) In connection with the Contract; and (d) Personal Injury or death.

	13.2 Policies and certificates for Insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such Insurance shall provide for compensation to be payable In Indian Rupees required to rectify the loss or damage Incurred. 13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may affect the Insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due. 13.4 Alterations to the terms of an Insurance shall not be made without the approval of the Engineer. 13.5 Both parties shall comply with any conditions of the Insurance policies.
14. Site Data	14.1 The Contractor shall be deemed to have examined any Site Data **referred to In the PCC**, supplemented by any Information available to the Contractor.
15. Queries about the PCC	15.1 The Engineer will clarify queries on the PCC
16. Contractor to Construct the Works	16.1 The Contractor shall construct and Install the Works In accordance with the Specifications and Scope of Work and as per Instructions of Engineer. 16.2 The contractor shall construct the works with intermediate technology, i.e., by manual means with medium input of machinery required to ensure the quality of works as per specifications. The contactor shall deploy the equipment and machinery as given in Section 3.
17. The Works to Be Completed by the intended Completion Date	17.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works In accordance with the Program submitted by the Contractor, as updated with the approval of the Engineer, and complete them by the Intended Completion Date.
18. Approval by the Engineer	18.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer, for his approval. 18.2 The Contractor shall be responsible for design of Temporary Works. 18.3 The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary Works. 18.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

	18.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Engineer before this use.
19. Safety	19.1 The Contractor shall be responsible for the safety of all activities on the Site specified in the Annexure -1 Clause C5.
20. Discoveries	20.1 Anything of historical or other Interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Engineer of such discoveries and carry out the Engineer's Instructions for dealing with them.
21. Possession of the Site	21.1 The Employer shall handover complete or part possession of the site to the Contractor 7 days in advance of construction program. At the start of the work, the employer shall handover the possession of at-least 50% of the site.
22 Access to the Site	22.1 The Contractor shall allow the Engineer and any person authorized by the Engineer access to the Site and to any place where work In connection with the Contract is being carried out or is intended to be carried out.
23 Instructions, Inspections and Audits	23.1 The Contractor shall carry out all Instructions of the Engineer which comply with the applicable laws where the Site is located. 23.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and sub-consultants to keep, accurate and systematic accounts and records In respect of the Works In such form and details as will clearly identify relevant time changes and costs.
24 Appointment of the Arbitrator	The Arbitrator shall be appointed as per the mutual agreement of both the parties.
25 Procedure for Disputes	If any dispute arises out of this Contract with regard to the interpretation, meaning and breach of the terms of the contract or in the work of operation, the matter shall be tried to be resolved amicably by the parties and in case of failure, the same shall be referred to the Sole Arbitrator to be appointed mutually by the parties, whose decision shall be final and binding on the parties. All arbitration proceedings shall be as per Arbitration and Conciliation Act 1996 with its amendments from time to time. The Seat of Arbitration shall be at Dehradun and the Courts at Dehradun alone shall have jurisdiction to entertain any matter arising out of this agreement/contract."

25.1.1 Program	**B. Time Control** 26.1 Within the time stated in the **PCC**, the Contractor shall submit to the Employer for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works and will submit the detailed drawings of the all of work and same shall be reviewed and approved by Engineer of DSCL or through other agency approved by DSCL. 26.2 The Contractor shall submit the list of equipment and machinery being brought to site, the list of key personnel being deployed, the list of machinery/equipment being placed in field laboratory and the location of field laboratory along with the Program. The Engineer-In charge shall cause these details to be verified at each appropriate stage of the program. 26.3 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities. 26.4 The Contractor shall submit to the Employer for approval an updated Program at intervals no longer than the period stated in the **PCC.** If the Contractor does not submit an updated Program within this period, the Employer may withhold the amount stated in the **PCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Engineer. 26.5 The Employer's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Employer again at any time. A revised Program shall show the effect of Variations and Compensation Events.
25.1.2 Extension of the Intended Completion Date	27.1 The Employer shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost. 27.2 The Employer shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Employer for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

28 Delays Ordered by the Engineer	28.1 Engineer may instruct the Contractor to delay the start or progress of any activity within the Works.
29 Management Meetings	29.1 The Engineer may require the Contractor to attend a management meeting. The business of a management meeting shall be to review the plans for the Works. 29.2 The Engineer shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Engineer either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.
30 Early Warning	30.1 The Contractor shall warn the Engineer at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, Increase the Contract Price, or delay the execution of the Works. The Engineer may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible. 30.2 The Contractor shall cooperate with the Engineer In making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone Involved In the work and In carrying out any resulting Instruction of the Engineer.
	Quality Control
31.Identifying Defects	31.1 The Engineer shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer may instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer considers may have a Defect.
32. Tests	32.1 The Contractor shall provide 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. 32.2 If the Engineer Instructs the Contractor to carry out a test not specified In the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.
33. Identifying Defects and Correction of Defects	33.1 The Engineer shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer may instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer considers may have a Defect. 33.2 The contractor shall permit the Employer's Technical auditor to check the contractor's work and notify the Engineer and Contractor of any defects that are

	found. Such a check shall not affect the Contractor's or the Engineer's responsibility as defined In the Contract Agreement. 33.3 The Engineer shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is **defined In the PCC.** The Defects Liability Period shall be extended for as long as Defects remain to be corrected. 33.4 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Engineer's notice.
1. Uncorrected Defects	34.1 If the Contractor has not corrected a Defect within the time specified In the Engineer's notice, the Engineer shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.
	Cost Control
2. Contract Price	35.1 In the case of an admeasurements contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item. 35.2 In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for Materials on Site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.
36 Changes In the Contract Price	36.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Engineer shall adjust the rate to allow for the change. The Engineer shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 20 percent, except with the prior approval of the Employer.
37 Variations	37.1 The Engineer shall, having regard to the scope of the Works and the sanctioned estimated cost, have power to order, in writing, Variations within the scope of the Works he considers necessary or advisable during the progress of the Works. Such Variations shall form part of the Contract and the Contractor shall carry them out and include them in updated Programs produced by the Contractor. Oral orders of the Engineer for Variations, unless followed by written confirmation, shall not be taken into account.
38 **Payments for Variations**	38.1 If rates for variation items are specified in Bill of Quantity, the contactor shall carry out such work at the same rate. This shall apply for variation only up to the limit prescribed in the PCC. 38.2 If the rates for Variation are not specified in the Bill of Quantities, the Engineer shall derive the rate from similar items in the Bill of Quantities.

39 Cash Flow Forecasts	39.1 When the Program, is updated, the Contractor shall provide the Engineer with an updated cash flow forecast.
40 Payment Certificates	40.1 The Contractor shall submit to the Engineer monthly statements of the estimated value of the work executed less the cumulative amount certified previously. 40.2 The Engineer shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor. 40.3 The value of work executed shall be determined by the Engineer. The value of work executed shall comprise: 40.4 In the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule. 40.5 The value of work executed shall include the valuation of Variations and Compensation Events. 40.6 The Engineer may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information
41 Payments	41.1 Payments shall be adjusted for deductions for advance payments security deposit, other recoveries in terms of the Contract and taxes at source, as applicable under the law. The Engineer shall pay the Contractor the amounts he had certified within 30 days of the date of each certificate 41.2 The Employer may appoint another authority, as specified in the PCC (or any other competent person appointed by the Employer and notified to the contractor) to make payment certified by the Engineer. 41.3 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices In the Contract. 41.4 Payment for Operation and Maintenance period shall be paid in quarterly installment for every year of the rate quoted by bidder in price bid. 41.5 Provisional sum of 2 % of the awarded value of work shall be provided for the work of shifting of poles, cables, Telephone lines or other works approved by DSCL .The payment shall be paid to contractor on production of original bills and as per actual work done.
42 Compensation Events	42.1 The following shall be Compensation Events unless they are caused by the Contractor 42.1.1 The Engineer orders a delay or delays exceeding a total of 30days. 42.1.2 The effects on the Contractor of any of the Employer's Risks.

	42.2 If a Compensation Event would prevent the Works being completed before the Intended Completion Date, the Intended Completion date shall be extended. The Employer shall decide whether and by how much the Intended Completion Date shall be extended.
43 Tax	43.1 The Engineer shall adjust the Contract Price if taxes, duties, and other levies are changed between the deadline for the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected In the Contract Price.
44 Currencies	44.1 All payments shall be made In Indian Rupees.
45 Price Adjustment	45.1 Not applicable
46 Security Deposit/ Retention and Release of Performance Security and Security Deposit/ Retention.	46.1 The Employer shall retain security deposit of 5% of the amount from each payment due to the Contractor until completion of the whole of the construction Work. No. security deposit/ retention shall be retained from the payments for Routine maintenance of works. 46.2 On the completion of the whole of the construction Work and completion of operation and maintenance of two year half the total amount retained as Security Deposit is repaid to the contractor and half when the operation and maintenance of five year has passed and the Engineer has certified that all defects notified by the Engineer to the contractor before the end of his period have been corrected. 46.3 The performance security equal to the ten percent of the contract price of contract is repaid to the contractor when the period of six years (Construction and operation and maintenance period) is over and the Engineer has certified that the contractor has satisfactorily carried out the Works. 46.4 If the contractor so desires then the Security Deposit can be converted into any interest bearing security of schedule commercial bank in the name of the Employer or National Saving Certificates duly pledged in favor of the Employer for Defect Liability Period including Operation and Maintenance.
47 Liquidated Damages	47.1 The Contractor shall pay liquidated damages to the Employer at the rate per week or part thereof stated in the PCC for the period that the Completion Date is later than the Intended Completion Date. Liquidated damages at the same rate shall be withheld if the Contractor fails to achieve the milestones prescribed in the PCC. However, in case the Contractor achieves the next milestone the amount of the liquidated damages already withheld shall be restored to the Contractor by adjustment in the next payment certificate. The total amount of liquidated damages shall not exceed the amount defined in the PCC. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's other liabilities. 47.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate.

48 Advance Payment	The Employer will make the interest bearing advance payment to the Contractor within 60 days of contract signing as follows: 48.1 Mobilization advance payment up to a maximum of 10% of initial contract price shall be paid to the contractor after submission of an unconditional and irrevocable bank guarantee in a form given by the employer and from any scheduled commercial banks or nationalized banks acceptable to the Employer for an amount equal to the advance payment (to be drawn before the end of 20% of the contract period). 48.2 Materials advance shall be paid only for non-perishable items as 75% of the total value of materials brought at site. At any one time materials of not more than 20% value of total BOQ items will be brought at site .After the consumption of the materials brought at site , next lot of materials will be brought. 48.3 The Contractor is to use the advance payment only to pay for Nonperishable Materials and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or there documents to the Engineer. The recovery of mobilization advance shall start from bill after the work done exceeds 10% of the initial contract price or **three** months from the date of payment of advance which ever period concludes earlier and shall be made at the rate of 15% of the work done in each IPC (Interim payment certificate) The recovery of advance shall be completed when 90% of the work has been completed or prior to the expiry of original time for completion whichever is earlier. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.
49 Securities	49.1 The Performance Security equal to ten percent of the contract price and additional security for unbalanced bids shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in the form given in the PCC and by a scheduled commercial bank. The Performance Security shall be valid until a date 45 days from the date of expiry of Defect Liability Period including Operation and Maintenance and the additional security for unbalanced bids shall be valid until a date 45 days from the date of issue of the certificate of completion.
50 Cost of Repairs	50.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at his cost if the loss or damage arises from the Contractor's acts or omissions..
	Finishing the contract
51 Completion of Construction and Operation and Maintenance	51.1 The contractor shall request the Engineer to issue a certificate of completion of the construction of the works, and the Engineer will do so upon deciding that the construction works is completed and after successful completion of operation and maintenance period of five year certificate of operation and maintenance will be issued.

52 Taking Over	52.1 Effective from the Transfer Date or the termination date, whichever is later, the Contractor shall, transfer and assign to the Employer or its nominated agency, as the case may be, free and clear from any charges, liens and encumbrances created by the Contractor of all the Contractor's right, title and interest in and to the Works/ movable and immovable assets. The Contractor shall also deliver to the Employer or its nominated agency on transfer date or the termination date, whichever is later such project reports, manuals, plans, design drawings, reports, accounts operation and maintenance manual and other information as may reasonably be required by the Employer or its nominated agency to continue the operation of the Project either directly or by its nominated agency. The personnel of the Contractor may continue to be the employees of the Contractor subject to their written consent and the transfer of all the movable & immovable assets shall not in any manner affect their status as employees of the Contractor and they shall have no claim to any type of employment or compensation from the Employer or its nominated agency, which arises prior to such transfer. 52.2 On completion of the transfer by the Contractor to the Employer, the Employer shall issue an "Operation and Maintenance Agreement Completion Certificate" to the Contractor. The Operation and Maintenance Agreement Completion Certificate will have the effect of constituting evidence of transfer of all rights, titles and interests in the Project by the Contractor, and their vesting in the Employer.
53 Final Account	53.1 The contractor shall supply the Engineer with a detailed account of the total amount that the Contractor considers payable for construction works under the contract within 21 days of issue of certificate of completion of construction of works. The Engineer shall issue a defect liability including Operation and Maintenance certificate and certify any payment that is due to the correct and complete. If the account is not correct or complete, the Engineer shall issue within 42 days a schedule that states the scope of the corrections or additions that are necessary. If the account is still unsatisfactory after it has been resubmitted, the Engineer shall decide on the amount payable to the contractor and issue a payment certificate within 28 days of receiving the Contractor's revised account. The payment of final bill for construction of works will be made within 14 days thereafter. 53.2 In case the account is not received within 21 days of issue of Certificate of Completion as provided in clause 50. I above, the Engineer shall proceed to finalize the account and issue a payment certificate within 28 days. The payment of final bill for construction of works will be made within 14 days thereafter.
54 Operating and Maintenance Manuals	54.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the PCC. 54.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the PCC, or they do not receive the Engineer's approval, the Engineer shall withhold the amount stated in the PCC from payments due to the Contractor.
55 Termination	55.1 The Employer may terminate the Contract if the Contractor causes a fundamental breach of the Contract.

	55.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following: I. The Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Engineer; II. The Contractor is declared as bankrupt or goes into liquidation other than for approved reconstruction or amalgamation; III. The Engineer gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer; IV. The Contractor does not maintain a Security, which is required; V. The Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in clause 44.1; VI. Any other fundamental breaches as specified in the PCC. VII. If the Contractor fails to deploy machinery and equipment or personnel as specified in the PCC at the appropriate time. 55.3 Notwithstanding the above, the Employer may terminate the Contract for convenience 55.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.
56 Payment upon Termination	56.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done and Materials ordered less liquidated damages, if any less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as indicated in the PCC. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be recovered from the security deposit, and performance security. If any amount is still left un- recovered it will be a debt payable to the Employer. 56.2 If the Contract is terminated at the Employer's convenience, the Engineer shall issue a certificate for the value of the work done, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the Contract, and less taxes due to be deducted at source as per applicable law.
57 Property.	57.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer for use for completing balance construction work if the Contract is terminated because of the Contractor's default, till the Works is completed after which it will be transferred to the Contractor and credit, if any, given for its use.

58 Releases from Performance	58.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of the Employer or the Contractor, the Engineer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.
59 Labor Laws and Regulations	59.1 The Contractor shall comply with all relevant labor laws and regulations applicable to the Contractor's personnel. 59.2 The Contractor shall provide equal wages and benefits to men and women for work of equal value or type. 59.3 The Contractor shall not employ any child to perform work, including 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. "Child" means a child below the statutory minimum age of 18 Years. 59.4 The Contractor shall not employ "forced and compulsory labor" in any form. "Forced or compulsory labor consists of all works or service, not voluntary performed that is extracted from an individual under threat or force or penalty. 59.5 The Contractor shall also comply the Labour law as given in Annexure 1
60 Environmental Laws and Regulations	60.1 The Contractor shall comply with all applicable national, provincial, and local environmental laws and regulations. The contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation. During continuance of the contract, the contractor shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority. 60.2 The Contractor shall comply the Environment Management Plan as given in Annexure 2.
61 Force Majeure	61.1 The contractor shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. 61.2 For purposes of this Clause, "Force Majeure" means an event or situation beyond the control of the Contractor that is not foreseeable, is unavoidable, and

	its origin is not due to negligence or lack of care on the part of the Contractor. Such events may include, but not be limited to, acts of the Employer in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes. 61.3 If a Force Majeure situation arises, the Contractor shall promptly notify the Employer in writing of such condition and the cause thereof. Unless otherwise directed by the Employer in writing, the Contractor shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
62 Role and Responsibility for Social Issue	62.1 The Contractor shall comply the Social issue given in Annexure 3.
63 Objective of PMC	63.1 The objective of this PMC is to assist the DSCL in implementation of the Project till the successful completion and handing over of all works to the DSCL and comprehensively supervise the works and activities carried out by the Bidder(s) as "Engineer's Representative" under the respective contract(s) in a manner that would ensure: 63.2 Total compliance of technical specifications and various other requirements contained in the respective contracts by the Bidder(s); 63.3 High standards of quality assurance system in the Consultancy as well as the works and activities of the Bidder(s); 63.4 Comprehensive and documented reporting to the DSCL of Consultant's own activities, progress of the Project(s) and compliances/ non-compliances by the Bidder(s); 63.5 Proper verification of measurements and bills submitted by the Bidder(s) so that payments made by the DSCL against these bills truly reflect the actual work done at site complying with the requirements of the respective contract(s);

SECTION VII
PARTICULAR CONDITIONS OF CONTRACT

Particular Conditions of Contract

A. General	
GCC 1.1 (r)	The Employer is Dehradun Smart City Limited, Dehradun, *Uttarakhand.*
GCC 1.1 (g) **GCC 1.1 (s)**	Completion period for Water Supply Augmentation & Supply, Installation, Commissioning, and Operation & Maintenance for Smart Water Meter & Related Infrastructure Work for Water Supply System of Dehradun city including Operation and maintenance for 5 years under "Smart City Mission" through e-procurement is 12 (Twelve) months from the date of contract signing. Engineer-in charge is the _____, appointed by Employer.
GCC 1.1 (bb)	The Project Management Consultant is technical consultant appointed by the Employer shall proof-check all GFC drawings/design submitted by the successful bidder and approve the drawings for execution of works.
GCC 1.1 (cc)	The Site is located at, Dehradun, ABD area, Uttarakhand.
GCC 1.1 (hh)	The intended Start Date shall be _____
GCC 1.1 (tt)	The Works consist: Request for Proposal for Water Supply Augmentation & Supply, Installation, Commissioning, and Operation & Maintenance for Smart Water Meter & Related Infrastructure Work for Water Supply System of Dehradun city including Operation and maintenance for 5 years under "Smart City Mission" through e-procurement.
GCC 3.1	The language of the contract is *English.* The law that applies to the Contract is the laws of Republic of India.
GCC 5.1	The Engineer *may* delegate any of his duties and responsibilities.
GCC 14.1	Site Data are as per Section V Part-1 Scope of work and Part-2 Technical Specifications.
GCC 21.1	The Site Possession Date(s) shall be: The site will be physically handed over by the Employer to the Contractor before date of start as per contract agreement and both the employer as well as the Contractor will issue a joint signed letter mentioning the handing over and taken over of the site.
B. Time Control	
GCC 26.1	The Contractor shall submit for approval a Program for the Works within 15 days from the date of the Letter of Acceptance and the Program shall be a part of the contract.
GCC 26.4	The period between Program updates is 10 days. The amount to be withheld for late submission of an updated Program is INR 1, 00,000/-.
C. Quality Control	

GCC 33.3	The Defects Liability Period is: one year
D. Cost Control	
GCC 41.2	Employer may appoint another authority, will be Project Management Consultant
GCC 46.1	The proportion of payments retained (Retention Money) shall be 5% from each monthly bill subject to the maximum of 5% of final contract price.
GCC 47.1	The liquidated damages for the whole of the Works are *[0.5% of the final Contract Price]* per week. The maximum amount of liquidated damages for the whole of the Works is *10%* of the final Contract Price. or milestone 1 0.50% of the Contract Price per week For milestone 2 0.50 % of the contract price per week For milestone 3 0.50% of the contract price per week Milestone Physical target* of Period from the date of start of work works to be completed Milestone 1 20% 1/3rd of Intended completion period ** Milestone 2 50% 2/3rd of Intended completion period** Milestone 3 100% Full Intended completion period** *Physical progress shall be assessed as per the latest MPR duly verified by Engineer. ** Intended completion period shall be twelve months from the Start Date.
GCC 48.1	An advance of 10 % of contract value shall be given to the contractor on submission of an unconditional and irrevocable bank guarantee in a form given by the employer and from any scheduled commercial banks or nationalized banks acceptable to the Employer for an amount equal to the advance payment. The advance payment shall be adjusted from the monthly invoices uniformly.
GCC 49.1	Within 21 (twenty one) days after receipt of the Letter of Acceptance/Award, the successful Bidder shall deliver to the Employer a Performance Security of ten (10%) of the Contract Price including of GST, valid up to 60 days beyond the date of completion of all the contractual obligations including any O&M period. The performance security shall be either in the form of an unconditional Bank Guarantee or fixed deposit Receipts (FDR), in favor of Chief Executive Officer, Dehradun Smart City Limited Payable at Dehradun, Uttarakhand, from a Nationalized or Scheduled Commercial Bank.

	Failure of the successful Bidder to comply with the requirements of this Clause shall constitute sufficient grounds for cancellation of the award and forfeiture of the Earnest Money. He will also be debarred from participating in future bids under Dehradun Smart City Limited.
	Finishing the contract
GCC 54.1	The date by which "as built" drawings (and maintenance manuals) are required - within 56 days of issue of completion certificate
GCC 54.2	The amount to be withheld for failing to produce "as built" drawings by the date required in GCC 54.1 is 10 lakh (INR)
GCC 55.2(V)	The maximum number of days is: 140 Days
GCC 58.1	The percentage to apply to the value of the work not completed, representing the Employer's additional cost for completing the Works, is 20%.

ANNEXURE-1

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

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

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

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

i. Pension or family pension on retirement or death, as the case may be.
ii. Deposit linked insurance on the death in harness of the worker. Payment of P.F. accumulation or retirement/death etc.

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

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

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

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

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

i) **Payment of Bonus Act 1965: -** Deleted

j) **Industrial Disputes Act 1947:-** The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

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

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

m) **Child Labour (Prohibition & Regulation) Act 1986:-** The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.

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

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

p) **Factories Act 1948 :-** The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons

or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

ANNEXURE-2

SALIENT FEATURES OF SOME OF THE MAJOR LAWS THAT ARE APPLICABLE FOR PROTECTION OF ENVIRONMENT.

1. The Environment (Protection) Act, 1986 and as amended: This provides for the Protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beIngs, other livIng creatures, plants and property. 'Environment' Includes water, air and land and the Inter-relationship which exists among and between water, air and land, and human beIngs, other livIng creatures, plants, micro-organism and property.

2. The Forest Conservation Act, 1980, as amended, and Forest (Conservation) Rules, 1981 as amended: These provides for protection of forests by restricting conversion of forested areas Into non- forested areas and prevention of deforestation, and stipulates the procedures for cuttIng any trees that might be required by the applicable rules. Permissions under the Act also stipulates the norms and compliance requirements of the employer and any contractor on behalf of the employer.

3. State Tree Preservation Acts as may be In force: These provide for protection of trees of important species. Contractors will be required to obtain prior permission for full or partial cutting, uprooting, or pruning of any such trees.

4. The Wildlife (Protection) Act, 1972, and as amended: This provides for protection of wildlife through notifying National Parks and Sanctuaries and buffer areas around these zones; and to protect Individuals of nationally important species listed In the Annex of the Act.

5. The Biological Diversity Act, 2002: This provides for conservation of biological diversity, sustainable use of components of biological diversity, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or Incidental thereto.

6. The Public Liability Insurance Act, 1991 as amended and The Public Liability Insurance Rules, 1991 as amended: These provide for public liability Insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for mattes connected herewith or Incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

7. The Ancient Monuments and Archaeological Sites and Remains Act, 1958 and the Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010, the Ancient Monuments and Archaeological Sites and Remains

Rules, 1959 amended 2011, the National Monuments Authority Rules, 2011 and the similar State Acts: These provide for conservation of cultural and historical remains found In India. Accordingly, area within the radii of 100m and 300m from the "protected property" are designated as "protected area" and "controlled area" respectively. No development activity (Including building, mining, excavating, blasting) is permitted In the "protected area" and development activities likely to damage the protected property is not permitted In the "controlled area" without prior permission of the Archaeological Survey of India (ASI) or the State Departments of Art 160 and Culture or Archaeology as applicable.

8. The Environmental Impact Assessment Notification, 2006 and as amended: This provides for prior environmental clearance for new, modernization and expansion projects listed In Schedule 1 of the Notification. Contractors will be required to ensure that no work starts until applicable clearances under the Notification is not available. Contractors will be responsible for implementation of any environmental and Social management plan stipulated as per the permission under this Notification; and will be required to prepare and submit to the employer and compliance report stipulated in the permission under the Notification.

9. The Water (Prevention and Control of Pollution) Act, 1974 as amended, and the Water (Prevention and Control of Pollution) Rules, 1975 as amended: These provide for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance Into water(whether directly or Indirectly) as may, or is likely to, create a nuisance or render such water harmful or Injurious to public health or safety, or to domestic, commercial, Industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms. Contractors will need to obtain consent for establishment and consent for operation of any item of work or Installation of equipment that generates waste water, and observe the required standards of establishment and operation of these items of work or Installations; as well as Install and operate all required waste water treatment facilities.

10. The Water (Prevention and Control of Pollution) Cess Act, 1977 and The Water (Prevention and Control of Pollution) Cess Rules, 1978: These provide for the levy and collection of access on water consumed by persons carrying on certain Industries and by local authorities, with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution under the Water (Prevention and Control of Pollution) Act, 1974.

11. The Air (Prevention and Control of Pollution) Act, 1981 as amended, and the Air (Prevention and Control of Pollution) Rules, 1982: These provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence In the

atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (Including noise) present In the atmosphere In such concentration as may be or tend to be Injurious to human beings or other living creatures or plants or property or environment. Contractors will need to obtain consent for establishment and consent for operation of any item of work or Installation of equipment that generates air pollution such as batching plants, hot mix plants, power generators, backup power generation, material handling processes, and observe the required standards of establishment and operation of these items of work or Installations.

12. Noise Pollution (Control and Regulation) Rules, 2000, and as amended: This provides for standards for noise for day and night for various land uses and specifies special standards in and around sensitive receptors of noise such as schools and hospitals. Contractors will need to ensure compliance to the applicable standards, and Install and operate all required noise control devices as may be required for all plants and work processes.

13. Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996: This provides for Requirement of preparation of on-site and off-site Disaster Management Plans for accident-prone areas.

14. The Explosives Act 1884 and the Explosives Rules, 2008: These provide for safe manufacture, possession, sale, use, transportation and import of explosive materials such as diesel, Oil and lubricants etc.; and also for regulating the use of any explosives used in blasting and/or demolition. All applicable provisions will need compliance by the contractors.

15. The Petroleum Rules, 2002: This provides for safe use and storage of petroleum products, and will need to be complied by the contractors.

16. The Gas Cylinder Rules 2004 and amendments: This provides for regulations related to storage of gas, and possession of gas cylinder more than the exempted quantity. Contractors should comply with all the requirements of this Rule.

17. Manufacture, Storage and Import of Hazardous Chemical Rules of 1989 and as amended: These provide for use and storage of hazardous material such as highly Inflammable liquids like HSD/LPG. Contractors will need to ensure compliance to the Rules; and In the event where the storage quantity exceeds the regulated threshold limit, the contractors will be responsible for regular safety audits and other reporting requirements as prescribed In the Rules.

18. Hazardous & Other Wastes (Management and Tran's boundary Movement) Rules, 2016: These provide for protection of general public from improper handling storage and disposal of hazardous waste. The rules prescribe the management requirement of hazardous wastes from its generation to final disposal. Contractors will need to obtain permission from the State Pollution Control Boards and other designated authorities for

storage and handling of any hazardous material; and will to ensure full compliance to these rules and any conditions imposed in the permit.

19. The Bio Medical Waste Management Rules, 2016: This provides for control, storage, transportation and disposal of bio-medical wastes. As and where the contractor has any first aid facility and dispensaries, established in either temporary or permanent manner, compliance to these Rules are mandatory.

20. Construction and Demolition Waste Management Rules, 2016: This provides for management of construction and demolition waste (such as building materials possible to be reused, rubble and debris or the like); and applies to all those waste resulting from construction, re-modeling, repair or demolition of any civil structure. Contractor will need to prepare a waste disposal plan and obtain required approval from local authorities, if waste generation is more than 20 tons in any day or 300 tons in any month during the contract period; and ensure full compliance to these rules and any conditions imposed in the regulatory approval.

21. The E-Waste (Management) Rules, 2016: This provides for management of E-wastes (but not covering lead acid batteries and radio-active wastes) aiming to enable the recovery and/or reuse of useful material from e-waste, thereby reducing the hazardous wastes destined for disposal and to ensure the environmentally sound management of all types of waste of electrical and electronic equipment. This Rule applies to every manufacturer, producer, consumer, bulk consumer, collection centers, 162 dealers, e-retailer, refurbished, dismantler and recycler Involved In manufacture, sale, transfer, purchase, collection, storage and processing of e-waste or electrical and electronic equipment listed In Schedule I, Including their components, consumables, parts and spares which make the product operational.

22. Plastic waste Management Rules, 2016: This provides for control and management of the plastic waste generated from any activity. Contractors will ensure compliance to this Rule.

23. The Batteries (Management and Handling) Rules 2001: This provides for ensuring safe disposal and recycling of discarded lead acid batteries likely to be used in any equipment during construction and operation stage. Rules require proper control and record keeping on the sale or import of lead acid batteries and recollection of the used batteries by registered recyclers to ensure environmentally sound recycling of used batteries. Contractors will ensure compliance to this Rule.

24. The Ozone Depleting Substances (Regulation and Control) Rules, 2000 and as amended: This provides for regulation of production and consumption of ozone depleting substances In the country, and specifically prohibits export to or import from countries not specified In the Rules, and prohibits unless specifically permitted, any use of ozone depleting substance.

25. The Coastal Regulation Zone Notifications, 1991 and as amended: This provides for regulation of development activities within the 500m of high tide line In coastal zone and 100m of stretches of rivers and estuaries Influenced by tides. Contractors will be required to ensure that no work starts until applicable clearances under the Notification is not available. Contractors will be responsible for implementation of any plan stipulated as per the permission under this Notification; and will be required to prepare and submit to the employer and compliance report stipulated in the permission under the Notification.

26. The Motor Vehicle Act 1988 as amended (and State Motor Vehicle Acts as may be In force) and the Motor Vehicle Rules, 1989, and as amended (and State Motor Vehicle Rules as may be In force): To minimize the road accidents, penalizing the guilty, provision of compensation to victim and family and check vehicular air and noise pollution. Contractors will be required to ensure full compliance to these rules.

27. Easement Act, 1882: This provides for the rights of landowners on groundwater. Contractors will need to ensure that other landowners' rights under the Act is not affected by any groundwater abstraction by the contractors.

28. State Groundwater Acts and Rules as may be in force and the Guidelines for Groundwater Abstraction for drinking and domestic purposes In Notified Areas and Industry/Infrastructure project proposals In Non-Notified areas, 2012: These provide for regulating extraction of ground water for construction/Industrial and drinking and domestic purposes. Contractors will need to obtain permission from Central/State Groundwater Boards prior to groundwater abstraction through digging any bore well or through any other means; and will to ensure full compliance to these rules and any conditions imposed in the permit.

29. The Mines Act, 1952 as amended; the Minor Mineral and concession Rules as amended; and the State Mineral (Rights and Taxation) Acts as may be in force: These provide for **163** for safe and sound mining activity. The contractors will procure aggregates and other building materials from quarries and borrow areas approved under such Acts. In the event the contractors open any new quarry and/or borrow areas, appropriate prior permission from the State Departments of Minerals and Geology will need to be obtained. Contractors will also need to ensure full compliance to these rules and any conditions imposed in the permit.

30. The Insecticides Act, 1968 and Insecticides Rules, 1971 and as amended: These provide for regulates the manufacture, sale, transport, distribution, export, import and use of pesticides to prevent risk to human beings or animals, and for matters connected therewith. No one should import or manufacture; sell, stock or exhibit foe sale; distribute, transport, use: (i) any misbranded Insecticides, (ii) any Insecticide the sale, distribution or use of which is for the time being prohibited under the Act; and (iii) any

Insecticide except In accordance with the condition on which it was registered under the Act.

31. National Building Codes of India, 2005 and as amended: This provides guidelines for regulating the building construction activities In India. The code mainly contains administrative regulations, development control rules and general building requirements; stipulations regarding materials, structural design and construction; and building and plumbing services. Contractors will be required to comply with all Bureau of Indian Standards Codes dealing with: (i) use and disposal of asbestos containing materials In construction; (ii) paints containing lead; (iii) permanent and temporary ventilations In workplace; (iv) safety, and hygiene at the workplace; (v) prevention of fire; (vi) prevention of accidents from faulty electrical gadgets, equipment and accessories; and all other such codes Incidental to the Contract.

ANNEXURE-3

The scope is to address and resolve social issues and consultations with stakeholders and communities, including socially and economically disadvantaged communities before during and after construction phase. The approach in particular include the following:

- Identifying key social issues associated with the proposed project and specify the project's social development outcomes;
- Assessing potential social and economic impacts both during the construction phase and in the operation phase.
- Reviewing policies, regulations and other provisions that relate to resettlement and rehabilitation, Equality, Socio-economic Development of people and other social issues;
- Social screening of various project components and likely impacts in terms of land, built-up Structures (loss of structures, houses, livelihood, etc.), and resultant involuntary resettlement and provide inputs (in terms of magnitude of impacts and mitigation measures).
- Based on the assessment of potential social and economic impacts establish criteria that will assist in the formulation of strategies; to the extent possible maximize project benefits to the local population and minimize adverse impacts of the project interventions in project area;
- Inform, consult and carry out dialogues with the project stakeholders on matters relating to project design, objectives, and implementation and provide specific recommendations to avoid/minimize social risks;
- Screen the social development issues in the project area and its vicinity and accordingly design the social services that may have to be provided by the project in order to improve the quality of life;
- Organization of Labour Awareness campaigns for Health, Hygiene and Safety.
- Organization of Community Awareness Campaigns on various social issues in project area.
- Community Consultations to obtain feedback and suggestions for better outcomes.
- Develop monitoring and evaluation mechanism to assess the social development outcomes.
- Ease of Access must be provided to the affected people (Road Users, Commercial and Residential).

- Proper Traffic Diversion Plan will be discussed, prepared and approved by the Transport Department as well as must be informed and circulated before initiation of work.
- Consultation with Shop Owners, House Owners and Community will be done and proper information will be circulated before initiation of work.
- Major construction activities will be implemented during night hours.
- All safety Provisions will be followed during construction.
- Cautionary Boards, Signages shall be installed at each construction site during construction.
- Road wise Awareness Campaigns & Sensitization programs for Road Users and Construction Labour can also be planned.
- ***If any partial damage of Commercial and residential structure will occur during construction, contractor will be responsible to compensate the loss and/or restore the same".***

SECTION VIII - CONTRACT FORMS

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made the . . . . . Day of . . . . . ., ..., between . . . . . [name of the Employer]. . . . . (Hereinafter "the Employer"), of the one part, and . . . . . [name of the Contractor]. . . . .(hereinafter "the Contractor"), of the other part:

WHEREAS the Employer 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,

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.

(i) This Contract Agreement
(ii) The Letter of Award
(iii) The Contractor's Bid Including completed schedules and priced bill of quantities,
(iv) The addenda Nos. _____ (if any)
(v) The Particular Conditions
(vi) The General Conditions of Contract, Including appendix;
(vii) The Specification
(viii) The drawings(
(ix) Construction Program, Methodology, Quality Assurance Program and Environmental and Social Management Plan
(x) Any other document listed In the PCC as forming part of the Contract.

3. In consideration of the payments to be made by the Employer to the Contractor as specified 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 specified above.

Signed by:	Signed by:
for and on behalf of the Employer	for and on behalf the Contractor
In the presence of:	In the presence of:
Witness, Name, Signature, Address, Date	Witness, Name, Signature, Address, Date

Performance Bank Guarantee

[Guarantor letterhead or SWIFT identifier code]

Performance Guarantee No……. ***[Insert guarantee reference number]***
Date……. ***[Insert date of issue of the guarantee]***

To:
Chief Executive Officer
Dehradun Smart City Limited
777, Saatvik Tower Kaulagarh Road,
Rajendra Nagar, Dehradun, Uttarakhand

In consideration of CEO, Dehradun Smart City limited (hereinafter as the "Employer", which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) awarding to _____ ***(Name of the contractor)*** having its registered office at _____ (hereinafter referred as the "Contractor", which expression shall, unless repugnant to the context or meaning thereof, include its successors, administrators and assigns), vide letter no. _____ ***(LOA No.)*** dated _____ valued at INR _____ ***(Amount in figures and words)*** (herein after referred to as the "Contract value") the work for _____ ***(Name of the work)***. The Contractor _____ having agreed to furnish a Bank Guarantee amounting _____ ***(Amount in figures and words)*** to the Employer for Performance Security of the said Agreement.

We, the _____ ***(Name of the Bank)***, at a company constituted under the companies Act 1956 and deemed to be a banking company under the Banking Regulation Act 1949 having one of its branch office at _____ ***(Branch Office Address)*** and having its Registered Office at _____ ***(Registered Office Address)*** (herein after referred to as 'The Bank') at the request of the employer do hereby pay to the employer an amount not exceeding _____ ***(Performance Bank Guarantee Value in figures and words)*** against any loss or damage caused to or suffered or would be caused to or suffered by the Employer by reason of any breach by the said Contractor of any of the terms or conditions contained in the said Agreement.

We, _____ ***(Bank Name)*** hereby affirm that we are the Guarantor and responsible to Employer, on behalf of the Contractor, up to a total of _____ ***(Performance Bank Guarantee Value in figures and words)***, such sum being payable in the types of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand to "the bank" or any other branch of _____ ***(Name of Bank)*** without cavil or argument, any sum or sums within the limits of _____ ***(Performance Bank Guarantee Value in figures and words)*** as aforesaid without needing to prove or to show grounds or reasons for demand for the sum specified therein however, such demand shall be made within the claim expiry date i.e. _____.

We, _____ ***(Name of Bank)*** undertake to pay to the employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor in any suit or proceeding pending before any court or tribunal relating thereto, our liability under this present being absolute irrevocable and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

We, further agree that no change or addition to or other modification of the terms of the Contract or related Services to be supplied there under or of any of the Contract documents which may be made between employer and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

We, the _____ ***(Name of Bank)*** further agree with the Employer that the employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said consultant from time to time or to postpone for any time or from time to time any of the powers exercisable by the employer against the said Contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor or for any forbearance, act or omission on the part of the employer or any indulgence by the employer to the said Contractor or any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so relieving us.

This guarantee will not be discharged due to the change in the constitution of the bank or the Contractor.

We, _____ ***(Name of Bank)*** lastly undertake not to revoke this guarantee during its currency except with the previous consent of employer in writing.

This guarantee shall be valid until _____ MONTHS (i.e.) 60 days following the Completion date of the Contract i.e. till _____including any warranty/Operation and Maintenance obligations, and any demand for payment under it must be received by us at this office on or before that date.

NOTWITHSTANDING ANYTHING CONTAINED HEREIN ABOVE:

(a) The Bank's liability under this guarantee shall not exceed the Guaranteed Amount i.e., _____ ***(Performance Bank Guarantee Value in figures and words)***

(b) This guarantee shall be valid up to the Expiry Date i.e._____ and

(c) The Bank is liable to pay the Guaranteed Amount or any part thereof under this Bank Guarantee only and only if a demand is made in writing on the Bank at any branch on or before the Claim Expiry Date i.e. _____, else all rights of the beneficiary under this Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there under.

Signature and seal of the guarantor _____

Name of Bank -

Address -

Date -

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

SECTION IX
Bill of Quantities (BOQ)

Bill of Quantities (BOQ)

"The Price Bid BOQ is documented separately and can be downloaded from e-procurement portal http://uktenders.gov.in along with the RFP document. The price bid BOQ in EXCEL FORMAT which is available on http://uktenders.gov.in website should be completely filled and should be uploaded as a part of the bid without which the bid shall be treated as NON-RESPONSIVE." The bidder has to quote the prices ***EXCLUSIVE OF GST***.