



सिद्धिमूर्त प्रबन्धनम्
भा. प्र. सं. इन्दौर
IIM INDORE

भारतीय प्रबंध संस्थान इंदौर

INDIAN INSTITUTE OF MANAGEMENT INDORE

प्रबंध शिखर, राउ पीथमपुर रोड़, इंदौर - 453556 (म. प्र.) भारत
Prabandh Shikhar, Rau-Pithampur Road, Indore - 453556 (M.P.), India
Ph. 0731-2439618, Email: estatecivil@iimidr.ac.in

इ-टेंडर नोटिस न. E-Tender Notice No.

आई. आई. एम. आई./एस्टेट/14/2026/277 फ़ाइल न. 601
IIMI/Estate/14/2026/277 File No. 601

तकनीकी व्यावसायिक प्रक्रिया
TECHNO COMMERCIAL PROPOSAL

Name of Work: "SITC of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore"


Tender Inviting Authority

प्रमाणित किया जाता है कि एनआईटी दस्तावेज़ में क्रमिक रूप से 1 से 109 तक 109 पृष्ठ हैं
Certified that the NIT Document contains 109 pages serially numbered from 1 to 109

Page 1 of 109

NIT- "SITC of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore".

भारतीय प्रबंध संस्थान इंदौर
INDIAN INSTITUTE OF MANAGEMENT INDORE

अनुक्रमणिका INDEX

क्रमांक Sr. No.	विवरण Contents	पृष्ठ क्र Page No.
	ई - निविदा आमंत्रण सूचना Notice Inviting e-Tender	3
A	महत्वपूर्ण घटनाओं / गतिविधियों की अनुसूची Schedule of Important Events / Activities	3
B	सीपीपीपी के माध्यम से ऑनलाइन बोली जमा करने के लिए दिशानिर्देश Guidelines for Online Bid Submission through CPPP	7
C	अन्य जानकारी और नियम और शर्तें Other information and terms & conditions	9
D	पात्रता मानदंड, मूल्यांकन और ठेकेदार का चयन Eligibility Criteria, Evaluation and Selection of Contractor	11
E	अपलोड किए जाने वाले दस्तावेजों की सूची List of Documents to be uploaded	15
F	टेंडरर को सामान्य निर्देश General Instructions to tenderers	16
G	भुगतान की शर्तें Terms of Payment	24
H	सुरक्षा कोड Safety Codes	25
I	अग्नि सुरक्षा Fire Safety	25
J	इंटीग्रिटी पैक्ट Integrity Pact	26
K	अनुबंध Agreement	33
L	तकनीकी विनिर्देश, और अनुमोदित निर्माता Technical Specifications & Approved Makes	36
M	अनुबंध की सामान्य स्थिति General Conditions of Contract	84
N	अनुसूचियों का प्रोफार्मा Proforma of Schedules	84
O	अनुबंध की विशेष शर्तें Special Conditions of Contract	89
P	विभिन्न रूपों / प्रमाण पत्रों के लिए प्रारूप Formats for Different Forms/Certificates	94
Q	वित्तीय बोली Financial Bid	99
R	Indicative Panel SLD	100

दिनांक /Dated: August 08, 2026

ई - निविदा आमंत्रण सूचना **NOTICE INVITING E-TENDER**

सन्दर्भ ई-टेंडर नोटिस न. आई. आई. एम. आई./ एस्टेट/14/2026/277 फ़ाइल न. 601

Ref: E-Tender Notice No. IIMI/Estate/14/2026/277 File No. 601

आईआईएम इंदौर निविदा दस्तावेज में उल्लिखित पात्रता मानदंड के अनुसार पात्र बोलीदाताओं से आईआईएम इंदौर में उल्लिखित कार्य के लिए ई-प्रोक्योरमेंट पोर्टल के माध्यम से ऑनलाइन आइटम दर निविदा आमंत्रित करता है। विवरण नीचे दिया गया है:
IIM Indore invites online item rate tender through e-procurement portal under mentioned work at IIM Indore from the bidders eligible as per the eligibility criteria mentioned in the tender document. The details are given below:

A.	महत्वपूर्ण घटनाओं / गतिविधियों की अनुसूची Schedule of Important Events / Activities
-----------	--

A.1 बोली से संबंधित जानकारी Information Related to Bid

A.1. 1	NIT No. IIMI/Estate/14/2026/277 File No. 601	
A.1. 2	About the Institute	IIM Indore is located on Rau Pithampur Road, 25 km away from main city centre. Our is an ethical Institution and we believe in transparency in every facets of work. There is least interference other than quality assurance and timely delivery. There is no need to interact with anyone other than concerned engineer. No material will be allowed to enter the campus from Security gate without passing the same by concerned engineer following technical specifications of the tender. There will be joint measurement of works when completed and bill will be submitted after the joint measurement is accepted. The payment will be made online without any contact with anybody. Strict quality control will be ensured for the job to be executed as per technical specification and make/brand of materials (in case of any brand or its equivalent specified, sample have to approved in advance).
A.1. 3	कार्य का नाम Name of Work	"SITC of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore"

A.1.4	निविदा की प्राक्कलित राशि (गुड्स एंड सर्विस टैक्स रहित) Estimated Cost Put to Tender (Excluding Goods & Service Tax)	Rs. 2,89,29,950/- (Rupees Two Crore Eighty-Nine Lakh Twenty-Nine Thousand Nine Hundred Fifty Only) Excl. GST
A.1.5	ईएमडी Earnest Money Deposit (EMD) (in Rs.)	Rs.5,78,599/- (Rs. Five Lakh Seventy-Eight Thousand Five Hundred Ninety-Nine Only) by e-payment through electronic mode (NEFT/ RTGS) Bank Detail is given below: Name of Beneficiary: Indian Institute of Management Indore Account No.: 53018623445 Name of the Bank: State Bank of India IFSC Code: SBIN0030525 Bidders will have to upload scanned copy of Payment details towards cost of EMD during the submission of tender and the same will be accepted only on verification & confirmation by the Institute. Any delay in credit will not be entertained by the Institute. Note: 1. EMD shall be refunded after the selection process is over. 2. Normally in case of unsuccessful bidders it gets refunded on or before the 30th day after the award of the contract. 3. The EMD deposited along with bid by the successful bidder shall be returned after receiving the requisite performance guarantee. 4. EMD may be forfeited • if any bidder withdraw or modify their Bids during the period of validity, or • if the successful bidder after being awarded the contract, fail to sign the contract, or to submit a performance Guarantee before the deadline defined in the NIT or as per the instruction of IIM Indore, whichever is later. In this case the action of forfeiture shall be undertaken without any notice. Also, the bidder shall not be allowed to participate in the re-tendering process of the services. Along with the aforesaid, they will be suspended for the period of two years from being eligible to submit Bids for contracts with the IIM Indore.
A.1.6	समापन की अवधि Completion period	120 Days

A.1.7	निविदा जमा करने की विधि Mode of submission of tender	केवल ऑन-लाइन मोड On-Line mode only
--------------	---	------------------------------------

A.2 प्रमुख घटनाएँ और तिथियाँ Key Events and Dates

A.2.1	प्रकाशित करने का दिनांक Publishing Date	August 08, 2026
A.2.2	Pre-Bid Meeting	The Pre-Bid meeting shall be held on August 18, 2026, at 03:30 PM. Prospective bidders are requested to submit their queries, if any, in writing through email on or before August 14, 2026. Bidders intending to participate in the Pre-Bid meeting must confirm their participation by August 17, 2026, by sending an email to the Estate Department at estatecivil@iimidr.ac.in. Those who are attending Pre-Bid meeting physically will be allowed on production of authorisation letter only.
A.2.3	दस्तावेज सहित निविदा के ऑनलाइन जमा करने की अंतिम तिथि और समय Last date and time of closing of uploading/online submission of tender	Up to 03:00 PM of August 28, 2026
A.2.4	तकनीकी बोली के ऑनलाइन खोलने की तिथि और समय Date & Time of online opening of technical bid	03:30 PM of August 29, 2026
A.2.5	योग्य बोलीदाताओं की वित्तीय बोली खोलने की तिथि और समय Date and Time of opening of financial bid of qualified bidders	बाद में सूचित किया जाएगा Will be notified later

A.3 बोली से संबंधित अन्य महत्वपूर्ण जानकारी Other Important Information Related to Bid

A.3.1	प्रतिभूति जमा Security Deposit	चालू बिलों और अंतिम बिल से 5% की वसूली की जाएगी जो दोष देयता अवधि के पूरा होने के बाद जारी की जाएगी। 5 % to be recovered from running bills & final bill which shall be released after the completion of Defect liability period of 12 month.
--------------	-----------------------------------	--

A.3.2	परफॉर्मन्स गारंटी Performance Guarantee	5% of tendered value on acceptance of bid. The performance guarantee may be submitted in the form of bank guarantee OR demand draft OR fixed deposit receipt from a scheduled commercial bank which shall be refunded after 60 days of completion of work as per complete scope of this NIT/issue of completion certificate whichever is later.
A.3.3	बोली की वैधता Bid Validity	निविदा खोलने की तिथि से 90 दिन 90 Days from the date of opening of tender
A.3.4	Method of Selection	Quality and Cost Based Selection
A.3.5	Workmen Compensation Insurance Policy	"Workman's Compensation Insurance Policy" for the workmen engaged by successful bidder for the aforesaid work against any eventuality arising from injury due to fall from height/ death due to any mishap / disability faced due to any such unwanted incidents etc. during the execution of work is to be submitted by you, before start of the work.
A.3.6	CAR Policy (Contractor's all risk) of the tendered value	CAR Policy should be submitted by successful bidder for the tendered value before start of work.

B.	Guidelines for Online Bid Submission Through CPPP
-----------	--

- B.1** It is mandatory for all the applicants to have class II or III digital signature certification from licensed certifying agency like NIC, MTNL, e-mudra, TCS, safescrypt, GNFC etc.
- B.2** Detailed NIT can be viewed free of cost on IIM Indore website under the URL <http://www.iimidr.ac.in/tenders/> . Schedule of quantities (Financial bid form) can be downloaded only from <https://eprocure.gov.in/eprocure/app>. Uploading of tender will be possible only after making payment of Tender Processing Fee and EMD.
- B.3** The tender shall be submitted online in the prescribed format before the date and time as mentioned in NIT. No other mode of submission is acceptable.
- B.4** The applicant have to upload the details of e-payment of processing fee & EMD before the last date & time and download the tender documents form the e-tendering portal <https://eprocure.gov.in/eprocure/app>.
- B.5** Tenderer are advised to upload their documents well in time to avoid last minute rush on the server or complication in uploading. IIM Indore will not be responsible for any type of problem in uploading the documents. No hard copies for tender submission shall be entertained.
- B.6** Online bid documents submitted by intending bidders shall be opened only of those bidders, who has deposited e-Tender Processing Fee and Earnest Money Deposit and other documents scanned and uploaded are found in order.
- B.7** Information and Instructions for bidders posted on website shall form part of bid document.
- B.8** The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website <https://eprocure.gov.in/eprocure/app> free of cost.
- B.9** Those contractors / vendors not registered on the website mentioned above, are required to get registered beforehand. If needed the intending bidders may get acquainted with the process online from the www.eprocure.gov.in site itself.
- B.10** On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
- B.11** Contractor can upload documents in the form of JPG format and PDF format.
- B.12** The price bid format is provided in a spread sheet file like BoQ_price bid.xls, the rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The Price Bid/BOQ\ template must not be modified/replaced by the

bidder; else the bid submitted is liable to be rejected for this tender.

- B.13** Contractor must ensure to quote rate of each item. Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO) although the item have to be executed as per scope of contract.
- B.14** The technical bid will be opened online first on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the technical bid shall be communicated to them at a later date.
- B.15** Completed Tenders containing technical bid and price bid will be received ONLINE only on CPP Portal website <https://eprocure.gov.in/eprocure/app> at the fixed time and date indicted in the NIT. The Tenderer will be at liberty to be present either in person or through an authorized representative at the time of opening of the Technical Bid with the Bid Acknowledgement Receipt or they can view the bid opening event online at their remote end.
- B.16** If there are any clarifications, this may be obtained online through the tender site, or thro' the contact details. Bidder should take into account the corrigendum published before submitting the bids online.
- B.17** It is construed that the bidder has read all the terms and conditions before submitting their offer. Bidder should go through the tender schedules carefully and upload the documents as asked; otherwise, the bid will be rejected.
- B.18** The bidder has to digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.
- B.19** The bidders are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour. Tenderers are advised to upload their documents well in time to avoid last minute rush on the server.
- B.20** The time settings fixed in the server side & displayed at the top of the tender site, will be valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system. The bidders should follow this time during bid submission.

C.	Other information and terms & conditions
-----------	---

C.1 The bid submitted shall become invalid:

- If the bidder is found ineligible.
- If any of the bidder put his quoted rates (as in financial bid document) in the envelope of Cover-I: Technical Bid.
- If the documents submitted by the successful bidder does not match with the originals before the award of work.

C.2 However, certified copy of all the scanned and uploaded documents as specified in NIT shall have to be submitted by the lowest bidder only within a week physically in the office of the “Chief Officer Engineering, Indian Institute of Management Indore, Prabandh Shikhar, Rau - Pithampur Road, Indore 453556 (M.P.).

C.3 IF ANY INFORMATION FURNISHED by the applicant is found to be incorrect at a later stage, they shall be liable to be debarred from tendering/ taking up works in IIM INDORE.

C.4 The competent authority on behalf of the Director IIM Indore does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

C.5 Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.

C.6 The competent authority on behalf of the Director, IIM Indore reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.

C.7 *The bid for the works shall remain open for acceptance for a period of Ninety (90) days from the date of opening of technical bid.* If any bidders withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the IIM Indore shall, without prejudice to any other right or remedy, be at liberty to suspend the bidder for two \s.

C.8 This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-

- The Notice Inviting Bid, all the documents including additional conditions, specifications, General Conditions of Contract and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
- Any other Standard C.P.W.D. Form /other forms as applicable/ mentioned.

C.9 TAXES: -

- i) The Contractor should get registered under GST and tax as applicable as per the extant order on the subject work shall be paid by the contractor to concerned department. Which will be reimbursed by the Institute as per the recommendation

of Finance & Accounts department of the Institute & the same will be final & binding to the contractor.

- ii) The quote should exclude the GST and inclusive of all other taxes applicable for the subject work.
- iii) Labour Welfare cess @ 1 % of gross value of work done shall be recovered from each bill paid to the contractor.
- iv) Income Tax and cess as applicable shall be deducted from bill paid to the contractor.
- v) Contractor should be registered under EPF and as per law, shall pay EPF of contract workers to concerned Department from time to time.
- vi) Any other taxes/cess as per Government directives shall be deducted from each bill paid to the contractor from time to time.

C.10 The specifications, Terms & Conditions, other regulations which are not herein mentioned will be guided by IIM First regulation, manual for procurement of works from ministry of finance & department of expenditure of Govt. of India, relevant CPWD guidelines, manual, specifications / BIS / IS/ Other Central / State Govt. norms applicable for IIM Indore & as prescribed by the OEM and the decision in this regard will be guided by the decision of the competent authority of IIM Indore which shall be final and binding to the contractor.

C.11 Tender documents may be downloaded from IIM Indore's website/ CPPP e-Publishing portal free of cost.

C.12 Tenders and supporting documents should be uploaded through eProcurement portal i.e. CPPP only. Hard copy of the tender documents will not be accepted.

C.13 In the event of acceptance of a tender or as per the decision of the competent authority of IIM Indore, the documents submitted by the bidder/ successful bidder shall be verified with the originals before the award of work.

C.14 On acceptance of the tender, the tenderer has to furnish a bar chart showing work completion schedule and submit it along with the performance security guarantee.

C.15 The tenderer should not have been blacklisted or debarred by any Central/ State/ Autonomous/ Public Agency during last three financial years. In case blacklisted/ debarred bidder fills/ submits the bid/ being successful in bidding process awarded the job or during the execution of job the fact of being blacklisted/ debarred surfaced then the

- Bid (during the bidding process) will be considered as invalid &
- During the execution, if surfaced, then the contract will be liable to be terminated

a. Minimum Eligibility Criteria: Prospective bidder should have the following for making oneself eligible for participation in the bidding process (Joint Ventures are not allowed):

1. **Work Experience:** Experience of having successfully completed similar works in any central government department, Central Institutions, PSUs, autonomous bodies, state government bodies, state PSUs, State Universities, Private companies/organisations (having turnover more than 50 crores) during the last five years ending previous day of last day of submission of tenders.

One similar completed work of aggregate cost not less than the amount equal to 80% i.e. Rs. 2,31,43,960/- of the estimated cost put to tender.

OR

Two similar completed works each costing not less than the amount equal to 60% i.e. Rs. 1,73,57,970/- of the estimated cost put to tender.

OR

Three similar completed works each costing not less than the amount equal to 40% i.e. Rs. 1,15,71,980/- of estimated cost put to tender.

Similar work means "SITC of Water Treatment Plant / Drinking Water Treatment Plant/Recycling Plant incorporating filtration/UF/RO or equivalent advanced treatment technology including allied piping, pumps, and instrumentation, automation/SCADA or PLC systems.

Bidder shall be required to submit the MOU on stamp paper of Rs. 100/- with Original Equipment Manufacturer of Dynasand filter and Nano bubble Technology provider i.e. Veolia / Nordic - Enquip / Siemens for technical support as well as design vetting for optimum performance of filtration system & Nano bubble technology during 5 Years of guarantee period to be clearly mentioned in the MOU document.

Note:

- The completion certificate issued from clients should indicate the date of commencement, period of completion- stipulated & actual, awarded cost & cost at completion, quality of work done, reason for delay (if any) etc.

If the work experience submitted by the bidder pertains to private Companies, organizations, or firms (i.e., entities other than government departments/organizations), then proof of TDS/tax deducted and a copy of the BOQ of the respective contract shall also be submitted.

2. **Turnover:** Average annual financial turnover on construction works should be at least Rs. 1,44,64,975/- (Rupees One crore Forty-Four lakh sixty-Four thousand Nine hundred and seventy-Five) during the last three consecutive financial years. (Scanned copy of original certificate from CA having UDIN Number to be uploaded).
3. **Profit/loss :** The bidder should not have incurred any loss (before tax) in more than two years during last five consecutive P&L accounts, duly audited & Certified by Chartered Accountant.
4. **Solvency Certificate:** Solvency of the amount equal to Rs. 1,15,71,980/- (Rupees One

crore Fifteen lakh Seventy-One thousand nine hundred Eighty Only) issued from scheduled commercial bank. (Date of issue should be during the period of this tender submission or else the validity period should be mentioned on the Solvency Certificate & this should cover up the tender submission period) (Solvency certificate should contain the following details:

1. Name of the person signing the Solvency
2. Designation of the person
3. Branch Code
4. Email ID and Contact No.
5. Date of Issue of Solvency
6. Date of Validity of Solvency Certificate)

Note: Bank OD/CC Limit Certificate, will not be considered and the certificate should clearly mention 'Solvency certificate.' Further, the Certificate of Solvency of the Director/Partners should not be submitted; it is required in the name of the Company/LLP/Partnership firm.

5. Certificates: (scanned copy of original certificates to be uploaded)

- 5.1 PAN (Permanent Account Number)
- 5.2 GST (Goods & Service Tax) Registration Certificate (in Active status)
- 5.3 E-payment details towards EMD

6. Past performance in IIM Indore: Bidder, whose contract in IIM Indore has been determined/terminated due to contractor's inability to execute the work, will be disqualified technically even though they may meet the other technical/eligibility criteria.

b. OVERALL EVALUATION PROCESS & SELECTION OF CONTRACTOR:

Bidding Process will be a two-bid system which comprises of technical bid and financial bid. Further the technical bid will be subdivided into two stages namely technical bid stage-1 and technical bid stage-2. The ratio of weightages for cost (financial) and technical score will be 70:30 (Seventy: Thirty) respectively.

The Method of selection will be Quality and Cost Based Selection (QCBS). As is said earlier the Technical bid will be evaluated in two stages, stage-1 will be based on minimum eligibility criteria required in respect of bidder's work experience & credentials whereas technical bid stage - 2 would be based on bidder's organizational structure, staffing, production capacity, quality assurance mechanism in place & local establishment and the same will be evaluated through the presentation submitted by bidder. After that the financial bid will be opened for the qualified bidders of the respective stage only. The weightage would be as follows.

i. Technical Bid

- Stage-1 (Bidder's work experience/ credentials) viz. minimum eligibility based on the criteria given at page no. 10 of NIT Document. For this no marks will be allocated towards final evaluation but this will be considered as mandatory for making oneself eligible to participate in the subsequent bidding process.
- Stage-2 (Comprising of bidder's organizational structure, staffing, quality assurance mechanism in place & local establishment) : Weightage 30% (based on presentation)

ii. Financial Bid (i.e. cost) =70%

The bidder scoring the highest marks after final evaluation i.e. combined/ composite will be considered for selection of a contractor after due negotiation of cost, if required.

Note:

i. The broad methodology brief is as follows:

“Proposal with the lowest cost may be given a financial score of 100 (Hundred) and other proposals given financial scores that are inversely proportional to their prices w.r.t. the lowest offer.

Similarly, proposal with the highest technical marks (as allotted by the evaluation committee) shall be given a score of 100 (Hundred) and other proposals be given technical score that are proportional to their marks w.r.t. the highest technical marks. The total score, both technical and financial, shall be obtained by weighing the quality and cost scores and adding them up. On the basis of the combined weighted score for quality and cost, the contractor shall be ranked in terms of the total score obtained. The proposal obtaining the highest total combined score in evaluation of quality and cost will be ranked as H-1 followed by the proposals securing lesser marks as H-2, H-3 and so on. The proposal securing the highest combined marks and ranked H-1 will be invited for negotiations, if required and shall be recommended for award of contract.”

ii. In the event two or more bids have the same score in final ranking, the bid with highest technical score will be H-1.

c. Details of marking & evaluation methodology:

c.1 TECHNICAL BID (STAGE-1)

The bidder will be shortlisted based on minimum eligibility criteria given at page 10 of 43 of NIT Document. For this no marks will be allocated towards final evaluation but this will be considered as mandatory for participation in the subsequent bidding process.

c.2 Technical bid (STAGE-2)

All those bidders who gets qualified in the Evaluation of Technical Bid (stage-1) will be eligible to participate in stage-2. The evaluation in this stage shall be based on presentation submitted by the bidder. The presentation shall be comprising of bidder’s organizational structure, staffing, quality assurance mechanism in place & local establishment for which weightage to be given as 30% towards final evaluation.

The marking shall depend on submitted presentation, presentation before the Committee constituted for the purpose and verification.

Parameter wise marking system is as under for presentation:

- Presentation shall be submitted in PDF attachment during submission of tender. No physical copy of presentation required.

Sl. No.	Criteria		Maximum Marks
1	Presentation	Organisational structure:- The Contractor will submit proof of engineers at their payroll without which no marks will be given under this section.	

		(a) Engineers (Total : 02 marks) i. 1-5 nos. -----01 Marks ii. More than 5 nos.-----02 Marks	02
2		(a) The bidder must have successfully completed Similar works (as defined above), over the last five years (ending previous day of last date of submission of tender) with the following criterion (Max.- 04 Marks): (i) Value of single completed work less than the estimated cost - zero Marks (ii) Value of single completed work equal to estimated cost - 01 Marks (iii) Value of single completed work is more than estimated cost but less than twice of estimated cost - 03 Marks (iv) Value of single completed work is more than or equal to twice of estimated cost - 04 Marks Note: - For values in between (i) & (ii) and those between (ii) & (iii) marks will be given on pro-rata basis. (b) Project Brief Presentation:- 20 Marks (The bidder will submit a Project brief Presentation.	24
3		Company's financials and plants & Machinery as per below: A. Company's Financial Strength: (i) Average annual financial turnover during the last three consecutive financial years {Max. 03 Marks} : a) 02 Marks for the value equal to the estimated cost b) 03 Marks for double or more of the estimated cost Note: - For value in between (a) & (b) marks will be given on pro-rata basis. For value less than estimated cost zero marks will be given (ii) Solvency Certificate {Max. 01 Marks}: a) 01 Marks for value twice or more than estimated cost Note: - For value equal or less than estimated cost zero marks will be given.	04
Total Marks			30

c.3 Financial bid: The weightage of marks scored in the financial bid shall contribute 70% towards the final evaluation.

E.	List of Documents to be uploaded
----	----------------------------------

While submitting bid, the following documents are to be uploaded:

For Cover-1:

- i) E-payment details towards EMD
- ii) NIT Document duly sign & sealed on each page to be scan and uploaded.
- iii) Certificates of Work Experience: Experience of having successfully completed works during the last 5 years ending previous day of last date of submission.
- iv) Copy of CA certificate having UDIN number for annual financial turnover to be uploaded
- v) Audited copy of profit & loss account
- vi) Copy of solvency certificate
- vii) PAN (Permanent Account Number)
- viii) GST (Goods and Services Tax) Registration Certificate
- ix) EPF registration certificate, if applicable
- x) ESI registration certificate, if applicable
- xi) Technical staff: List of technical staff they possess and proposed to deploy for the work to be uploaded
- xii) Certification of Incorporation/ Registration of firm
- xiii) IT Return for AY 2025-26
- xiv) Presentation prepared by bidder
- xv) Power of Attorney for the person who will sign the agreement (if applicable)
- xvi) Undertaking/ letter of Transmittal as per the format given at Annexure-1
- xvii) Undertaking for "Local Content certification" to be submitted in your company's letter head as per standard format prescribed in Annexure-3.
- xviii) Bank Account details
- xix) Declaration regarding pending cases (if any) of litigation, arbitration, debarment etc.
- xx) Letter of Authorization: An authorization letter must be submitted on your company's letterhead, authorizing the person who will sign the documents and RA/Final Bills on behalf of the firm.

For Cover-2:

- i) Schedule of Price Bid in the form of .xls

F.	General Instructions to Tenderers
----	-----------------------------------

(A) Scope of Work

- a. The work comprises of **Supply, Installation, Testing & Commissioning (SITC)** of Water Treatment Units of **350 KLD & 150 KLD Capacity** based on **Dynasand + Nanobubble + Ultrafiltration (UF) + Reverse Osmosis (RO)** technology, complete with pumps, piping, valves, electrical works, PLC/SCADA, instrumentation and all allied accessories as detailed in the BOQ, specifications and as directed by the Engineer-in-Charge.
- b. The bidder is required to provide a comprehensive water treatment solution with the objective of producing water quality conforming to **WHO/BIS Drinking Water Standards**, ensuring uniform treated water quality at every outlet across the campus.
- c. The contractor shall carry out all civil, mechanical, electrical and instrumentation works, including testing, commissioning, trial run, performance testing and successful handing over of the complete system.
- d. All incidental works required for successful completion of the project, including cutting, drilling, grouting, equipment foundations, pipe supports, sleeves, making good and other allied civil works, shall form part of the contractor's scope without any extra cost.
- e. The contractor shall submit catalogues/samples of all materials and equipment giving technical data for approval of the Engineer-in-Charge before procurement and shall use only approved makes as approved by Engineer-In-charge. A conceptual layout plan will be provided by IIM Indore.
- f. The contractor shall prepare and submit their design and detailed shop drawings/Working Drawings, including equipment layout, piping layout, electrical and instrumentation drawings, foundation details and interconnection drawings etc. in line with requirements of water quantity expressed in this tender, for approval of the Engineer-in-Charge within 15 days from the issue of LOI before commencement of procurement and installation.
- g. Contractor shall furnish and install a complete working Water Treatment Plant installation as per approved shop drawings and as described in this specifications and as per the latest BIS codes. If any item (S) of work (S) which are explicitly/implicitly not specified in BOQ but are necessary either as per specifications/BIS Codes or as per mandatory / local authority requirements; these shall be identified by the contractor with cost implication at the time of submission of tender (as an annexure) failing which no claims to this respect shall be permitted during execution of the contract.
- h. The contractor shall submit all technical data sheets, test certificates, warranty certificates, O&M manuals, as-built drawings and NABL water quality test reports before handing over the work.
- i. Cleaning of all equipment and piping including flushing of all pipe work to remove any foreign matter shall be carried out in sections as the work progresses.

- j. Contractor shall temporarily cover & protect all equipments & open pipe ends etc. It is the responsibility of the Contractor to protect all the installed fittings and all equipments until the time of testing, commissioning & handing over to the owners.
- k. Painting of all concealed and exposed pipes, equipment as specified including weather proof treatment on exposed/ buried pipe work shall be part of this contract, even if it is implicitly/explicitly not specified in B.O.Q.
- l. k. The site shall be cleaned after completion, and all debris, surplus materials and waste generated during execution shall be removed from the premises by the contractor.
- m. Before commencement of the work, the contractor shall inspect the site, verify all existing utilities, levels, dimensions and site conditions. No claim arising out of lack of site inspection or incorrect assessment of site conditions shall be entertained.
- n. The location of the Water Treatment Plant pipe lines, indicated in the drawing is only indicative. The actual route of pipe lines may differ from the plans according to the details of the building construction and the conditions of executions of the installations.

The contractor shall supply and install at his expense all secondary materials and special fittings found necessary to overcome the interference and to supply the modifications on the route of Water Treatment Plant pipe lines that are found necessary during the work, to the complete satisfaction of the Engineer-In-Charge.

- o. Contractor shall submit as inbuilt drawings, operation and maintenance manual for all equipments/operations etc. Framed operating & maintenance instructions shall be provided in plant room.
- p. Contractor shall submit the list of various manufacturers/ suppliers/dealers including their detailed addresses & telephone numbers from whom the various materials/ equipment shall be purchased.
- q. Quoted rates shall be firm during the execution of the contract.

(B) Associated Works :

a. Associated Civil Works

Following Civil works associated with Water Treatment Plant installation shall be carried out by the contractor and their cost is inbuilt in their bid and nothing extra shall be payable:-

- Open drain channel.
- UG/OH water tanks.
- Drainage sumps.
- RCC foundation for pumps and other equipments.
- Dismantling of existing plant / machinery/other civil items(if required as per design)
- Any other civil/electrical work required in order to complete the work.

b. Associated Electrical Works :

The scope of work shall include the **complete Design, fabrication, assembling, wiring, supply, installation, testing and commissioning (SITC)** of both the 350 KLD and 150 KLD capacity Water Treatment Plant (WTP) Motor Control Centre (MCC) Panel, suitable for 415 V, 3 Phase, 4 Wire, 50 Hz AC supply, fabricated from 2.0 mm thick (14 SWG) CRCA sheet steel with adequate reinforcement using suitable angle irons, channel sections and/or flats wherever required. The panel shall be provided with removable cable gland plates at both top and bottom, two earthing terminals, electronic energy meter, voltmeter, ammeter, lifting hooks (where applicable), and all necessary accessories. The panel shall be chemically treated with anti-corrosive treatment, finished with two coats of red oxide primer followed by approved shade powder coating. All hardware shall be galvanized with zinc passivation. The contractor shall obtain approval of panel drawings prior to fabrication. The work shall include complete internal wiring, assembly, testing, commissioning and all accessories required for satisfactory operation, complete in all respects, as per technical specifications, approved drawings and directions of the Engineer-in-Charge.

Note:The detailed Bill of Materials (BOM), ratings, quantities of switchgear/components, and technical specifications of the WTP Motor Control Centre (MCC) shall be as specified under Technical Specifications & Approved Makes of NIT (Page No.39-45)

(C) Inspection of materials/work at site

The Engineer-in-charge and /or his representative shall inspect the materials at site after delivery before the same is used in the work. The Engineer-In-charge shall have free and full access at any time during execution of the contract to the contractor's works or site. In case of execution of work for the aforesaid purpose, and IIM's engineer may require the contractor to make arrangements for inspection of work or any part thereof or any material at his premises or at any other place specified by the IIM Indore's Engineer.

(D) The IIM Indore's Engineer shall have the power-

- To reject the whole/part of the items/ materials/ equipment's tendered for inspection, if after inspection of such portion thereof, as he may in his discretion think fit, he is satisfied that the same is unsatisfactory; and
- To mark the rejected items / materials or parts with a rejection mark so that it may easily be identified if re-submitted.

(E) Maintenance & Guarantee/ Warranty:

- The rate quoted should be inclusive of charges of all the works & respective associated accessories including SITC of the materials/ equipment's at earmarked / specified locations including maintenance during Defect Liability Period of 12 (Twelve) Months.
- During the Defect Liability Period, IIM Indore reserve the right to cross check the performance of any item / material with the minimum performance levels specified in the specifications.
- Any damage of the existing structure, building etc. made by the successful bidder during execution of this work shall be made good as it was at his own cost & risk and to the satisfaction of Engineer-in-Charge.

(F) On site operation and Maintenance:

- The contractor shall undertake the operation and maintenance (O&M) of water Treatment plant for a period of 2 (Two) months after the successful completion of the work including consumable items for period of 2 (Two) months as per the BOQ.
- During the Operation & Maintenance (O&M) period, the contractor shall deploy the following manpower at the site:

Sr. No.	Designation	No. of manpower	Qualification details	Experience in O&M of WTP (In years)
1	Supervisor	02	ITI/Diploma in the relevant discipline	4 Years
2	Helper	02		2 Years

- Details of indicative consumables are mentioned in the below attached sheet

RO / UF CHEMICAL REQUIREMENT 350 M3/Day

Dosing formula basis: standard water-treatment dosing-pump sizing method (as used in Nalco / Ion Exchange India RO & UF chemical dosing practice)

PLANT / STREAM INPUTS (edit the yellow cells)

Plant / Stream Name	350													
Design Flow Rate (m ³ /hr)	29.17													
Operating Hours (Hr/Day)	12													
Days per Month	30													

S.No	Chemical Name	Purpose / Application	Dosage (PPM / mg-L)	Stock Conc. (% w/w)	Specific Gravity of Stock	Use Plant Hours ? (Y/N)	Operating Hours (Hr/Day)	Chemical Consumption (Kg/Hr)	Total /Day (Kgs)	Monthly Requirement (Kgs)	Dosing Pump Rate (LPH)	Rate	Total
1	CAUSTIC (NaOH)	pH correction - UF/RO feed	5	10%	1.11	Y	12	0.15	1.75	52.5	1.31		
2	HYDROCHLORIC ACID (HCl)	pH depression / LSI (scale) control	15	32%	1.16	Y	12	0.44	5.25	157.5	1.18		
3	SODIUM HYPOCHLORITE (NaOCl)	Disinfection / biofouling control	3	12%	1.15	Y	12	0.09	1.05	31.5	0.63		
4	ANTISCALANT	RO membrane scale inhibition	3	100%	1.2	Y	12	0.09	1.05	31.5	0.07		
5	SBS (Sodium Bisulphite)	Dechlorination - RO pretreatment	5	10%	1.1	Y	12	0.15	1.75	52.5	1.33		
6	CITRIC ACID	Membrane CIP (periodic, not daily)	120	100%	1	N	2	3.50	7	210	3.50		
												INR	0

Rows above are a starter template with typical industry dosage RANGES for common ETP/UF/RO chemicals — replace names, dosage (ppm), stock concentration, and SG with your OEM datasheet / jar-test values. Add or delete rows as needed; formulas in columns H–L auto-fill if you copy a row down.

Formulas | Consumption (Kg/Hr) = Dosage (ppm) x Flow (m³/hr) x 0.001 | Total/Day (Kg) = Consumption x Operating Hours | Monthly (Kg) = Total/Day x Days/Month | Dosing Pump Rate (LPH) = Consumption (Kg/Hr) / (Stock Conc.% x Specific Gravity)

This is the standard mass-balance dosing-pump sizing method used across the water-treatment industry (Nalco, Ion Exchange India, Thermax, VA Tech Wabag etc. use the same underlying formula in their O&M dosing datasheets). Specific Gravity is included so concentrated acids/liquids (HCl SG~1.16, NaOCl SG~1.15 etc.) are sized correctly by volume, not just by weight-percent. Always confirm final dosage against the chemical supplier's datasheet, membrane OEM recommendation, or a jar test — actual rawfeed water quality (hardness, alkalinity, silica, organics) changes the required ppm.

Column G 'Use Plant Hours?' — set to Y to link a chemical's operating hours to the plant-wide Operating Hours input above (e.g. continuous dosing chemicals), or N and enter its own Hr/Day in column H for chemicals that run on a separate schedule (e.g. CIP, which is periodic — see Citric Acid row).

RO / UF CHEMICAL REQUIREMENT 150 M3/Day

Dosing formula basis: standard water-treatment dosing-pump sizing method (as used in Nalco / Ion Exchange India RO & UF chemical dosing practice)

PLANT / STREAM INPUTS (edit the yellow cells)

Plant / Stream Name	150												
Design Flow Rate (m ³ /hr)	16.6												
Operating Hours (Hr/Day)	12												
Days per Month	30												

S.No	Chemical Name	Purpose / Application	Dosage (PPM / mg-L)	Stock Conc. (% w/w)	Specific Gravity of Stock	Use Plant Hours? (Y/N)	Operating Hours (Hr/Day)	Chemical Consumption (Kg/Hr)	Total /Day (Kgs)	Monthly Requirement (Kgs)	Dosing Pump Rate (LPH)	Rate	Total
1	CAUSTIC (NaOH)	pH correction - UF/RO feed	5	10%	1.11	Y	12	0.08	1.00	29.88	0.75		
2	HYDROCHLORIC ACID (HCl)	pH depression / LSI (scale) control	15	32%	1.16	Y	12	0.25	2.99	89.64	0.67		
3	SODIUM HYPOCHLORITE (NaOCl)	Disinfection / biofouling control	3	12%	1.15	Y	12	0.05	0.60	17.928	0.36		
4	ANTISCALANT	RO membrane scale inhibition	3	100%	1.2	Y	12	0.05	0.60	17.928	0.04		
5	SBS (Sodium Bisulphite)	Dechlorination - RO pretreatment	5	10%	1.1	Y	12	0.08	1.00	29.88	0.75		
6	CITRIC ACID	Membrane CIP (periodic, not daily)	120	100%	1	N	2	1.99	3.98	119.52	1.99		
												INR	0

Rows above are a starter template with typical industry dosage RANGES for common ETP/UF/RO chemicals — replace names, dosage (ppm), stock concentration, and SG with your OEM datasheet / jar-test values. Add or delete rows as needed; formulas in columns H–L auto-fill if you copy a row down.

Formulas | Consumption (Kg/Hr) = Dosage (ppm) x Flow (m³/hr) x 0.001 | Total/Day (Kg) = Consumption x Operating Hours | Monthly (Kg) = Total/Day x Days/Month | Dosing Pump Rate (LPH) = Consumption (Kg/Hr) / (Stock Conc.% x Specific Gravity)

This is the standard mass-balance dosing-pump sizing method used across the water-treatment industry (Nalco, Ion Exchange India, Thermax, VA Tech Wabag etc. use the same underlying formula in their O&M dosing datasheets). Specific Gravity is included so concentrated acids/liquids (HCl SG~1.16, NaOCl SG~1.15 etc.) are sized correctly by volume, not just by weight-percent. Always confirm final dosage against the chemical supplier's datasheet, membrane OEM recommendation, or a jar test — actual rawfeed water quality (hardness, alkalinity, silica, organics) changes the required ppm.

Column G 'Use Plant Hours?' — set to Y to link a chemical's operating hours to the plant-wide Operating Hours input above (e.g. continuous dosing chemicals), or N and enter its own Hr/Day in column H for chemicals that run on a separate schedule (e.g. CIP, which is periodic — see Citric Acid row).

(G) Monitoring Systems & Training

- Designing, Developing & Implementation of real-time monitoring using IoT- based systems to track key water quality parameters (pH, Turbidity, TDS, Residual Chlorine, Dissolved Oxygen (DO), Flow, Pressure, Hardness and other parameters as specified by the Engineer-in-Charge.
- Provision of remote monitoring systems for efficient management.
- Minimum 7 days Training for user groups & local Operations & Maintenance body on operation and maintenance of installed systems.

(H) Water Quality Testing:

- Monthly water quality tests at NABL-accredited laboratories to monitor and ensure compliance with prescribed water quality norms or as & when required by the Engineer-In-Charge and nothing extra shall be payable on this account.

(I) Commissioning and Guarantees:

- The rates quoted in this tender shall be inclusive of the works given in this section. Contractor shall provide all tools equipment, metering and testing devices required for the purpose.
- On award of work, contractor shall submit a detailed proposal giving methods of testing and gauging the performance of the equipment to be supplied and installed under this contract.

a. Pre-commissioning:

On completion of the installation of all pumps, piping, valves, pipe connections, and water level controlling devices the contractor shall proceed as follows :-

i Pipe work:

Check all clamps, supports and hangers provided for the pipes.

Fill up pipes with water and apply hydrostatic pressure to the system as given in the relevant section of the specifications. If any leakage is found, rectify the same and retest the pipes.

ii Testing of M.C.C.

Test for Motor control centers shall be:

- Insulation resistance test with 500 V megger, before and after high voltage test, on all power and control wiring.
- High voltage test at 2000 V AC for one minute on all power and control wiring.
- Low Voltage continuity test (6 V) on power wiring of each feeder, between bus bars and the outgoing terminals with switches and contactors in closed position.
- Low voltage continuity test (6 V) on all control wiring.
- Operation test for all feeders with only control supply made "ON" to ensure correctness of control wiring, operation of the various equipment used such as push buttons, protective devices, indicating lamps and relays etc. All contactors shall be checked for the presence of humming and chattering.

- Earth continuity test with voltage not exceeding 6 V between various non-current carrying metallic parts of equipment, steel work etc. and the earth bus provided in the MCC.
- Operation of all instruments and meters provided on the MCC.

b. Water Treatment Equipment

- Check all the water treatment plant equipment and all connected piping, valves and operate each and every valve on the system to see if the valves are functioning properly.
- After the above check but prior to filling the sand, resin, dosing chemicals etc. into the vessels, carryout the hydro test of the system at shut-off head of the feeding pump. If any leaks are found to occur, the Contractor shall rectify and repeat the hydro test until no leakage occurs.
- Fill the sand, resin and dosing chemicals.
- Check rotation of each motor after decoupling and correct the same if required.
- Test run each pump set.
- All pump sets shall be run continuously for 8 hours (if required with temporary piping back to the tank).
- Check all annunciations by simulating the alarm conditions at site.

c. Final Acceptance Tests

Following commissioning and inspection of the entire installation, and prior to issue of the Completion Certificate, the Contractor shall carry out final acceptance tests in accordance with a programme to be agreed with the Engineer-In-Charge.

Should the results of the acceptance tests show that plant, systems and/or equipment fail to perform to the efficiencies or other performance figures as given in this Specification, the Contractor shall adjust, modify and if necessary replace the equipment without further payment in order that the required performance is obtained.

Where acceptance tests are required by the relevant Authorities having jurisdiction, these tests shall be carried out by the Contractor prior to the issue of Completion Certificate to the acceptance of the Engineer-In-Charge.

G.	Terms of Payment
----	------------------

Release of payment: Payment shall be made by IIM Indore to the contractor under following condition:-

- Final bill/RA bill to be paid when submitted along with supporting documents. Payment shall be made under actual measurement as per Clause-7 & 10B mentioned under Schedule F of the tender.
- The contractor shall also submit to the department his computerized Abstract and Measurement Book.
- Contractor should get registered under GST and tax as applicable as per the extant order on the subject contract shall be paid by the contractor to concerned department which will be reimbursed/paid by the Institute as per the recommendation of Finance & Accounts department of the Institute & the same will be final & binding to the contractor.
- Income Tax and cess as applicable shall be deducted from bill paid to the contractor.
- Any other taxes/cess as per government directives shall be deducted from bill paid to the contractor from time to time.
- The performance guarantee shall be refunded to the contractor after the completion of the work/service and recording of the completion certificate as above.
- Security Deposit will be released after completion of DLP period.
- Payment to be made online to vendor's bank account. Vendor must give details of the bank account for online transaction of payment after Submission of Final bill duly certified by IIM to the institute representative.

Note:

- Contractors should have financial capability to finance the project on their own without waiting for RA Bill payment from IIM Indore to progress on job.
- RA Bills will be paid based on measurement of the BoQ item-wise job carried out at site, supported by MB entry and certification by the Engineer of the quantity Verified for payment.
- All effort will be made to release R.A bills payments within 30 days from the date of submission of bill with complete required documents (List enclosed as per annexure-4) by the contractor.

- All effort will be made to release Final bill as per Clause 9 of GCC subjected to complete submission of document as per list attached at annexure-4 by the contractor.

H.	Safety Codes
----	--------------

Relevant safety codes of the CPWD to the extent applicable to the IIM Indore. Decision in this regard will be governed by the competent authority of IIM Indore which shall be final and binding to the contractor.

I.	Fire Safety
----	-------------

This will be as per the Fire Safety codes of the CPWD to the extent applicable to the IIM Indore. Decision in this regard will be governed by the competent authority of IIM Indore which shall be final and binding to the contractor.

INTEGRITY PACT

To,

.....,

.....,

.....

Sub: NIT No. IIMI/Estate/14/2026/277 File No. 601 for the work of “SITC of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore”

Dear Sir,

It is here by declared that IIM Indore is committed to follow the principle of transparency, equity and competitiveness in public procurement. The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the IIM Indore.

Yours faithfully

Chief Officer Engineering

INTEGRITY AGREEMENT

This Integrity Agreement is made at on this day of 2026

BETWEEN

The Director, IIM Indore represented through Chief Officer Engineering, IIM Indore, (Hereinafter referred as the IIM Indore, Prabandh Shikhar, Rau-Pithampur Road, Indore “Principal/Owner”, which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....
..... (Name and Address of the Individual/ firm/ Company)

Through

(Hereinafter referred to as the (Details of duly authorized signatory) “Bidder/Contractor” and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender IIMI/Estate/14/2026/277 File No. 601 (hereinafter referred to as “Tender/Bid”) and intends to award, under laid down organizational procedure, contract for “SITC of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore” Hereinafter referred to as the “Contract”.

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as “Integrity Pact” or “Pact”), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

(1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days' notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.

(2) Forfeiture of EMD/Performance Guarantee/Security Deposit: If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.

(3) Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 1: Commitment of the Principal/Owner

(1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

(b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential /

additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.

(c) The Principal/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.

(2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code

(IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/Contractor(s)

(1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the IIM Indore / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.

(2) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:

(a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.

(b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.

(c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically. (d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent

on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

(d) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.

(3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the IIM Indore interests.

(5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/her reputation or property to influence their participation in the tendering process).

Article 4: Previous Transgression

(1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.

(3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

(1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/sub-vendors.

(2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.

(3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/ Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6- Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded. If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, IIM Indore.

Article 7- Other Provisions

(1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal/Owner, who has floated the Tender.

(2) Changes and supplements need to be made in writing. Side agreements have not been made.

(3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.

(4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.

Article 8- LEGAL AND PRIOR RIGHTS

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....

(For and on behalf of Principal/Owner)

.....

(For and on behalf of Bidder/Contractor)

WITNESSES:

1.....

(Signature, name and address)

2.....

(Signature, name and address)

Place:

Dated:

K.	Agreement
----	-----------

Format for Agreement

THIS AGREEMENT made at Indore on the ____ day of ____ 2026 between Indian Institute of Management Indore Rau- Pithampur Road, Indore (hereinafter called "The IIM INDORE" which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns) of the one part AND _____

_____ (herein after called "The Contractor" which expression shall, unless repugnant to the context or meaning thereof, include its successors and permitted assigns) of the other part.

WHEREAS

The IIM INDORE is desirous of carrying out the work of "SITC of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore." issued vide NIT No.: IIMI/Estate/14/2026/277 File No. 601

The Works are to be executed as per the scope of work, technical specifications, drawings etc. as is mentioned in the tender document for tendered rate amounting to Rs. _____.

The Contractor has agreed to execute the said works subject to the provisions hereinafter contained and subject also to General Conditions of Contract, Special conditions of contract, Safety Code, Model Rules for the protection of health and other arrangements for workers, Specifications, Preambles and Schedule of Quantities and erection & furnishing schedule (all of which are hereinafter collectively referred to as the 'said tender conditions') and strictly in accordance with the Scope of work annexed hereto at or for the respective rates set out in the Schedule of Quantities amounting to the sum as there under arrived at or such other sums as shall become payable there under (hereinafter referred to as the said tendered amount).

NOW IT IS HEREBY AGREED AS FOLLOWS: -

1. In consideration of the said tendered amount to be paid by The IIM INDORE to the Contractor at the time and in the manner set forth in the said tender conditions and in accordance with the Schedule of Payments to execute and complete the work shown upon the said Drawings strictly in accordance with the specifications and Schedule of Quantities.
2. The said tender conditions, scope of work and the annexure-1 hereto shall be read and considered as forming part of this contract and the parties hereto shall respectfully abide

by to the said conditions and perform the agreement on their part respectively contained in the said conditions.

3. The approved drawings if any, notice inviting tenders technical specification etc. shall also form the basis of this contract.
4. This contract is neither a Lump sum Contract, nor a piece work contract, but is a contract on item rate basis to be carried out and to be paid for according to the Schedule of Payments at the rates contained in the Schedule of Quantities.
5. The contract herein contained shall comprise not only the works mentioned above but all subsidiary works connected therewith within the same site as may be ordered to be done from time to time by the said Engineer-In-charge for the time being, even if such work may not be shown on the said Drawings or described in the said Specifications and Schedule of Quantities.
6. The IIM INDORE reserves to themselves the right of altering the drawings and the nature of the work by adding to or omitting from the scope of work any item of work or portions of the same without prejudice to this contract.
7. Time shall be considered as the essence of this contract and the Contractor hereby agrees to commence the work as mentioned in LOI/ work order and shall complete the entire work within the stipulated time limit.
8. All payments by the IIM INDORE under this contract shall be made only at Indore.
9. All disputes arising out of or in any way connected with this contract shall be deemed to have arisen in respect of IIM Indore and Director IIM Indore only shall have jurisdiction to determine the same.
10. That the contract and several parts of this contract have been read by the contractor and fully understood by him. The contractor shall not be entitled for payment beyond tendered quantities unless ordered specifically by written instructions of the Engineer-in-charge IIM INDORE.
11. This contract shall be signed in duplicate, the original whereof shall be kept in the custody of the IIM INDORE and the duplicate with the Contractor.
12. The Engineer-in-Charge may, without prejudice to his any other right or remedy against the contractor in respect of any delay, non-commencement, inferior workmanship, any claim for damages and/ or any other provisions of this contract or otherwise, and whether the date for completion has or has not elapsed, by notice in writing determine/ repudiate the contract.

IN WITNESS WHEREOF the IIM INDORE has set his hands hereunto and duplicate hereof through his duly authorized official and the Contractor has caused these presents and duplicate hereof under his common seal by his duly authorized representative at the place and on the date month and year first herein above written.

SIGNED, SEALED AND DELIVERED by IIM INDORE, by the hand of

Signature:

Name:

Designation:

IN THE PRESENCE OF

(1) Signature:

Name:

Address:

(2) Signature:

Name:

Address:

SIGNED, SEALED AND DELIVERED BY the Contractor M/s _____

Signature:

Name:

Designation:

IN THE PRESENCE OF

(1) Signature:

Name:

Address:

(2) Signature:

Name:

Address:

L.	Technical Specifications & Approved Makes
----	---

a) General

The specifications of the items will be guided by the respective specifications (if not truly matching then similar item) laid down in the CPWD specification in case of items relates to the DSR item & For Non-DSR items it will be guided by the item description along with the direction of Engineer-in-charge. Institute reserves the right to specify the makes in order to ensure best quality material in the interest of the work & institute.

b) List of Approved Make

S. No.	Description	Makes
1.	Clear Water Supply Pumps	Wilo / Grundfos / Xylem
2.	Hydro-pneumatic Pumping System	Wilo / Grundfos / Xylem
3.	VFD for Hydro-pneumatic System	Danfoss / Siemens / ABB / Grundfos
4.	PLC	Schneider / Siemens / ABB
5.	Pressure Vessel	Varem / Zelmet
6.	Sump Pumps (Drainage & Sewage)	Wilo / Grundfos / Xylem
7.	UF System Integrator	Wastech Infra India / Veolia / Triveni / Toshiba
8.	Dosing Pump	Asia LMI / Prominent
9.	Motor	Kirloskar / Siemens / Crompton
10.	Mechanical Seal	Burgman / Sealol / Dunlop
11.	Couplings (Tyre-Type)	Dunlop / Lovejoy
12.	Electronic Flow Meter	Krohne (Forbes Marshall) / Rockwin
13.	Water Meter (Mechanical Type)	Kent / Kranti
14.	PH Meter	Yanaco / Xylem / Forbes Marshal
15.	Pressure Switch	Danfoss / Switzer
16.	Pressure Gauges	Feibig / Emerald / H Guru
17.	Level Controller & Indicator	Cirus / Technika / Minilec

18.	Ultra-Violet Units	Novarius / Nordic Water / Atlantium / Trojan
19.	DYNA Sand System	Enquip / Nordic / Veolia / Xylem
20.	G.I Pipe/M.S. Pipe (IS: 1239)(Heavy Duty)	Jindal (Hissar) / Tata / Prakash Surya
21.	GI pipes fittings	Unik / R / Zoloto M / DRP - M
22.	uPVC Pipe & Fittings (IS : 4985)	Supreme / Astral / Prince
23.	CPVC Pipe & Fittings(SDR-11)	Supreme / Astral / Ashirwad
24.	Pipe Supports /Clamps	Chilly / Camry / Euro Clamp
25.	Ball Valves	Zoloto / Sant / Leader
26.	Nanobubble Generation Unit	Wastech Infra / Enquip / Novarius / Molear USA
27.	UF Membrane	Asahi / Mitshubhisi
28.	RO Membrane	Dow / Veolia
29.	Wafer Type Check Valve	Zoloto / Advance / Sant / Leader
30.	Butterfly Valve	Zoloto / Advance / Sant / Leader
31.	Strainer	Zoloto / Emerald / Kartar / Sant
32.	Vibration Eliminator / Anti vibration Mounting	Resistoflex / Kanwal Ind Corporation / Easyflex
33.	Air Release Valve	Zoloto / NVR / Leader
34.	Solenoid Valve	Danfoss / Honeywell
35.	Pressure Reducing Valve	Honeywell / RB Italy
36.	Epoxy Paint & Paint Primer	Asian / Dulux
37.	Welding Rods	Victor / Advani / ESAB
38.	Fastner	Hilti / Fischer / Canon
39.	Fire Sealant	Birla 3 M / Hilti / Promat
40.	WTP Panel	VEE4 Tech /Tricolite / Adlec
41.	Moulded Case Circuit Breaker / MPCB	Schneider (CVS) / L&T (D-Sine) / ABB (T- Max) / Siemens (3 VL)
42.	MCB	Schneider (Acti-9) / Siemens (Beta
43.	Capacitor Unit	EPCOS - TDK / ABB
44.	Switch Fuse Units	L&T / GEC Alsthom / ABB

45.	Current Transformers	Automatic Electric / Kappa / G&M
46.	Contactors and Starters	Schneider / ABB / L&T / Siemens
47.	Relays	Areva / L&T/ GE / CSPC
48.	IC Main Switches	Schneider / ABB / L&T / Siemens
49.	Change Over Switches	Schneider / ABB / L&T / Siemens
50.	Timers	L&T / Schneider / Siemens
51.	Push Buttons	L&T / BCH / Siemens / Rank
52.	Indicating Lamps	BCH / L&T (ESBEE) / Rank
53.	KWh Meters	AE / MECO / Rishline (L&T)
54.	Meters (Ammeter & Voltmeter)	Automatic Electric / DUCATI / Rishline (L&T) / Conzerv
55.	Selector Switches and Rotary Switches	Kaycee / Salzer
56.	Indicating Instruments	AE / Rishabh / Schneider / Siemens
57.	Terminal Block	Elmex / Connect Well
58.	Cable Glands	Commet / Gripwell
59.	Lugs	Dowell / Jainsons
60.	PVC Insulated Copper Conductor Wires 650/1100 Volts Grade FRLS	RR Kabel / KEI / Finolex / Havell's
61.	1100V LT Armoured XLPE Aluminium / Copper Power & Control Cables	RR Kabel / KEI / Finolex / Havell's
62.	ERW M.S. Conduits (ISI MARK)	AKG / BEC / Steel Kraft
63.	Over Load Relays & Single Phase Prevented	Schneider / ABB / L&T / Siemens
64.	GI Cable Tray	MEM / Steel Kraft
65.	Any other Item.	Sample to be approved by Engineer-In-Charge

Note: IIM has rights to choose any one of the makes mentioned in the list of approved makes, and Contractor shall take prior written approval for quantity & time of delivery from the Engineer-in-Charge before placing order(s) of the materials.

Panel Switchgears details for 350 KLD Plant (Included in BOQ):-

A. UF Plant Panel

Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre shall be fabricated out of 14/16 gauge CRCA sheet steel with reinforcement of suitable size angle iron, channel irons and/or flats wherever necessary. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system with electronic type energy meter, volt meter and A-meter. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel before fabrication. Galvanised hardware with zinc passivation shall be used in fabrication of panels.

MCC-1 (WTP Motor Control Centre)- Compartment Type

Incoming

100 amps TPN MCCB with the following accessories:

a. Digital electronic VAF Meter(voltmeter, Ampere Meter & Frequency) shall be protected by 2 amps TP MCB. 1 Set

b. Electronic Type Energy meter (KWH meter). 1 Set

c. Phase indicating lamps shall be protected by 2 amp SP MCB 3 Sets

Metering

VAF Meter protected by 2A control MCB's

KHW Meter protected by 2A control MCB's

Phase indicating lamps with toggle switches

Bus Bar:

120A TPN aluminium , colour coded bus bars suitable for 415V, 50Hz. (after deration)

Outgoing:

Required no. and capacity of MCB for DOL/ Star Delta starter and outgoing feeders for all pumps, motors and operating equipment. Each compartment shall contain Auto/ Manual switch, contactor, relay, single phase preventer, sequential controller for auto operation of working and standby equipment complete in all respects for the following, but not limited to:

3 KW DOL Filter Feed Pumps - 2 No

5.5 KW DOL UF Feed Pumps - 2 No

7.5 KW S/D UF Backwash Pumps - 2 No

0.37 KW DOL NAOCL Dosing Pumps - 1 No

0.37 KW DOL Acid Dosing Pumps - 1 No

5.5 KW DOL Nano Bubble Pumps - 1 No
2.2 KW DOL Nano Bubble Pumps - 1 No
1.5 KW DOL Air Blower - 1 No
1.5 KW DOL Air Compressor - 1 No
0.04 KW A/M pH Correction Dosing Pump - 1 No
0.04 KW A/M Flocculent Dosing Pump - 1 No
0.01 KW A/M Actuator Valve - 6 No
0.01 KW pH Meter - 1 No
0.01 KW Flow Meter -1 No
0.01 KW UV- 1 No
Panel shall be designed on the actual KW/HP as per model selection of pumps and makes.
Notes :
All MCCBs shall be rated for a minimum breaking capacity of 25 kA, and all MCBs shall be rated for a minimum breaking capacity of 10 kA. Both shall be suitable for motor duty applications.
All motor starters shall be provided with Automatic level Switch
DOL starters shall be used for motors below 10HP and Star-Delta Starters for other motors.
Provision shall be made for providing potential free contacts to all pumps starters for connectivity on BMS.
Provision for dry run protection shall be made in the panel.
MCC for WTP as described above
All Control system to make the WTP fully automatic. The operation of the pumps shall be controlled by the level Switch.
The panel should have sufficient no. of potential free contacts for monitoring purposes.

B. RO Plant Panel

Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre shall be fabricated out of 14/16 gauge CRCA sheet steel with reinforcement of suitable size angle iron, channel irons and/or flats wherever necessary. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system with electronic type energy meter, volt meter and A-meter. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel before fabrication. Galvanised hardware with zinc passivation shall be used in fabrication of panels.

<u>MCC-1 (WTP Motor Control Centre)- Compartment Type</u>
Incoming
100 amps TPN MCCB with the following accessories:
a. Digital electronic VAF Meter(voltmeter, Ampere Meter & Frequecy) shall be protected by 2 amps TP MCB. 1 Set
b. Electronic Type Energy meter (KWH meter). 1 Set
c. Phase indicating lamps shall be protected by 2 amp SP MCB 3 Sets
Metering
VAF Meter protected by 2A control MCB's
KHW Meter protected by 2A control MCB's
Phase indicating lamps with toggle switches
Bus Bar:
120A TPN aluminium , colour coded bus bars suitable for 415V, 50Hz. (after deration)
Outgoing:
Required no. and capacity of MCB for DOL/ Star Delta starter and outgoing feeders for all pumps, motors and operating equipment. Each compartment shall contain Auto/ Manual switch, contactor, relay, single phase preventer, sequential controller for auto operation of working and standby equipment complete in all respects for the following, but not limited to:
3 KW DOL RO Feed Pumps - 2 No
11 KW DOL VFD High Pressure Pumps - 2 No
2.2 KW DOL CIP Pump - 1 No
0.37 KW DOL Agitator - 1 No
0.04 KW Antiscalant Dosing Pumps - 1 No
0.04 KW SMBS Dosing Pumps - 1 No
0.04 KW pH Correction Dosing Pumps - 1 No
0.01 KW A/M Actuator Valve - 5 No
0.01 KW Low Pressure Switch - 1 No
0.01 KW High Pressure Switch - 1 No
1 No. 16A TPN MCB spare
1 No. 10A TPN MCB spare
Panel shall be designed on the actual KW/HP as per model selection of pumps and makes.
<u>Notes :</u>

All MCCBs shall be rated for a minimum breaking capacity of 25 kA, and all MCBs shall be rated for a minimum breaking capacity of 10 kA. Both shall be suitable for motor duty applications.
All motor starters shall be provided with Automatic level Switch
DOL starters shall be used for motors below 10HP and Star-Delta Starters for other motors .
Provision shall be made for providing potential free contacts to all pumps starters for connectivity on BMS.
Provision for dry run protection shall be made in the panel.
MCC for WTP as described above
All Control system to make the WTP fully automatic. The operation of the pumps shall be controlled by the level Switch.
The panel should have sufficient no. of potential free contacts for monitoring purposes.

Panel Switchgears details for 150 KLD Plant (Included in BOQ: -

A. UF Plant Panel

Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre shall be fabricated out of 14/16 gauge CRCA sheet steel with reinforcement of suitable size angle iron, channel irons and/or flats wherever necessary. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system with electronic type energy meter, volt meter and A-meter. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel before fabrication. Galvanised hardware with zinc passivation shall be used in fabrication of panels.
<u>MCC-1 (WTP Motor Control Centre)- Compartment Type</u>
Incoming
100 amps TPN MCCB with the following accessories:
a. Digital electronic VAF Meter(voltmeter, Ampere Meter & Frequency) shall be protected by 2 amps TP MCB. 1 Set
b. Electronic Type Energy meter (KWH meter). 1 Set
c. Phase indicating lamps shall be protected by 2 amp SP MCB 3 Sets
Metering

VAF Meter protected by 2A control MCB's
KHW Meter protected by 2A control MCB's
Phase indicating lamps with toggle switches
Bus Bar:
120A TPN aluminium , colour coded bus bars suitable for 415V, 50Hz. (after deration)
Outgoing:
Required no. and capacity of MCB for DOL/ Star Delta starter and outgoing feeders for all pumps, motors and operating equipment. Each compartment shall contain Auto/ Manual switch, contactor, relay, single phase preventer, sequential controller for auto operation of working and standby equipment complete in all respects for the following, but not limited to:
3 KW DOL Filter Feed Pumps - 2 No
5.5 KW DOL UF Feed Pumps - 2 No
7.5 KW S/D UF Backwash Pumps - 2 No
0.37 KW DOL NAOCL Dosing Pumps - 1 No
0.37 KW DOL Acid Dosing Pumps - 1 No
5.5 KW DOL Nano Bubble Pumps - 1 No
2.2 KW DOL Nano Bubble Pumps - 1 No
1.5 KW DOL Air Blower - 1 No
1.5 KW DOL Air Compressor - 1 No
0.04 KW A/M pH Correction Dosing Pump - 1 No
0.04 KW A/M Flocculent Dosing Pump - 1 No
0.01 KW A/M Actuator Valve - 6 No
0.01 KW pH Meter - 1 No
0.01 KW Flow Meter -1 No
0.01 KW UV - 1 No
Panel shall be designed on the actual KW/HP as per model selection of pumps and makes.
Notes :
All MCCBs shall be rated for a minimum breaking capacity of 25 kA, and all MCBs shall be rated for a minimum breaking capacity of 10 kA. Both shall be suitable for motor duty applications.
All motor starters shall be provided with Automatic level Switch
DOL starters shall be used for motors below 10HP and Star-Delta Starters for other motors.
Provision shall be made for providing potential free contacts to all pumps starters for connectivity on BMS.
Provision for dry run protection shall be made in the panel.

MCC for WTP as described above
All Control system to make the WTP fully automatic. The operation of the pumps shall be controlled by the level Switch.
The panel should have sufficient no. of potential free contacts for monitoring purposes.

B. RO Plant Panel

Design, fabrication, assembling, wiring, supply, installation, testing and commissioning of motor control centre shall be fabricated out of 14/16 gauge CRCA sheet steel with reinforcement of suitable size angle iron, channel irons and/or flats wherever necessary. Cable gland plates shall be provided on top as well as at the bottom of the panels. Panels shall be treated with all anticorrosive process before painting as per specifications with 2 coats of red oxide primer and final approved shade of powder coated paint. 2 Nos. earthing terminals shall be provided for 3 phase, 4 wire, 50 Hz supply system with electronic type energy meter, volt meter and A-meter. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel before fabrication. Galvanised hardware with zinc passivation shall be used in fabrication of panels.
<u>MCC-1 (WTP Motor Control Centre)- Compartment Type</u>
Incoming
100 amps TPN MCCB with the following accessories:
a. Digital electronic VAF Meter(voltmeter, Ampere Meter & Frequency) shall be protected by 2 amps TP MCB. 1 Set
b. Electronic Type Energy meter (KWH meter). 1 Set
c. Phase indicating lamps shall be protected by 2 amp SP MCB 3 Sets
Metering
VAF Meter protected by 2A control MCB's
KHW Meter protected by 2A control MCB's
Phase indicating lamps with toggle switches
Bus Bar:
120A TPN aluminium , colour coded bus bars suitable for 415V, 50Hz. (after deration)
Outgoing:
Required no. and capacity of MCB for DOL/ Star Delta starter and outgoing feeders for all pumps, motors and operating equipment. Each compartment shall contain Auto/ Manual switch, contactor, relay, single phase preventer, sequential controller for auto operation of working and standby equipment complete in all respects for the following, but not limited to:
3 KW DOL RO Feed Pumps - 2 No

9 KW DOL VFD High Pressure Pumps - 2 No
2.2 KW DOL CIP Pump - 1 No
0.37 KW DOL Agitator - 1 No
0.04 KW Antiscalant Dosing Pumps - 1 No
0.04 KW SMBS Dosing Pumps - 1 No
0.04 KW pH Correction Dosing Pumps - 1 No
0.01 KW A/M Actuator Valve - 5 No
0.01 KW Low Pressure Switch - 1 No
0.01 KW High Pressure Switch - 1 No
1 No. 10A TPN MCB spare
1 No. 16A TPN MCB spare
Panel shall be designed on the actual KW/HP as per model selection of pumps and makes.
Notes :
All MCCBs shall be rated for a minimum breaking capacity of 25 kA, and all MCBs shall be rated for a minimum breaking capacity of 10 kA. Both shall be suitable for motor duty applications.
All motor starters shall be provided with Automatic level Switch
DOL starters shall be used for motors below 10HP and Star-Delta Starters for other motors.
Provision shall be made for providing potential free contacts to all pumps starters for connectivity on BMS.
Provision for dry run protection shall be made in the panel.
MCC for WTP as described above
All Control system to make the WTP fully automatic. The operation of the pumps shall be controlled by the level Switch.
The panel should have sufficient no. of potential free contacts for monitoring purposes.

Note: The Indicative Panel SLD is enclosed as Annexure-4 (Page Nos. 100 - 109 of the NIT).

c) Technical Specification:

1. Description of System:-

- The continuous filter system should be installed within concrete basins

The system provided shall be constructed of proven components that have been demonstrated successful operation under similar operating conditions.

- The filter should produce a continuous filtrate stream or flow and a continuous stream or flow of reject water. The filters should not require shutdown or taken out of duty due to any backwash cycles. No backwash valves, pumps or instrumentation for the same shall be required. Continuous sand cleaning shall be accomplished within the filter using already filtered water. Feed water or influent water should not be used.
- The filter should be of the type continuous backwash, upflow, single media filter. Mixed filter media or thin bed media should not be used. The sand bed should be washed internally and redistributed on top of the sand bed an average 4-6 times per day. No external sand movement or washing should be used.
- The filter shall work according to the counter-current principal. The feed water should be introduced within the sand bed at the bottom of the sand bed, and flow by gravity as the filtration starts upwards through the sand bed. The filter media should travel downwards to the point where the internal air-lift pump lifts the media to the sand washer at the top of the filter. The sand washer should have a double weir to adjust the waste water rate and should be constructed in two halves for easy cleaning and all wetted parts should be made of injected moulded plastic.
- The filter should not contain any moving parts, the filter should not contain any screens, wedge wires, grids or similar things.
- The air-lift pump should be fed by air from a high- or low-pressure compressor, between 4-5 bars. The air supply system to the filter shall consist of a pneumatic cabinet including an air filter, control valve, air flow meter, pressure regulator and pressure gauge. One panel should be used for each group or filter basin. Each panel shall include a solenoid valve to allow automatic start/stop of air lift pump.
- The flow to each filter, basin or filter group should be self-equalizing. No flow controls, regulators shall be required. Equalizing should not be used by using an overflow weir.

2. Additional items:

- Inlet butterfly or gate valves isolating the individual filters, basins or filter groups should be used.
- Flexible connectors preferable rubber boots are to be used internally within the filters or within

filter basins to connect pipes to permit installation and cast-in-place sleeves and pipes to avoid boxing out pipe passages.

3. General

- Description: The filter internal shall be shop fabricated, fully assembled, and tested prior to shipment. Connections and mechanism supports shall be oriented as shown on the drawings.
- All structural steel when so are used should comply with the “Standards of Structural Steel of the ASTM”
- All equipment should be designed for continuous, twenty-four hour operation, and all parts of mechanism should be fit for purpose and stable for the stresses that may occur during erection & operation.
- All wetted parts shall be EN1.4301 (304SS), EN1.4404 (316SS), titan, FRP, polyacetal or polypropylene. No carbon steel will be allowed.

3.1 Material of construction:

Filter tank and Legs	N/A
Internals	EN1.4301
Sand washer labyrinth	PPH
Rubber couplings	EPDM (Food grade as per standard)
Airlift pump	PPH/PE
Head loss indicator pipe	N/A
Deaeration pipe	PVC
Grating	SS
Other wetted parts	EN1.4301 / EN1.4404 / FRP

3.2 Fabrication:

- Shop fabrication and welding should be accordance with EC Machinery Directive 2006/42/EC, EU standards EN ISO 12100 1&2, EN ISO 14121-1 or similar. All welded structural connections shall develop the full strength of the connected elements and all joined or lapped surfaces shall be completely seal welded. Intermittent welding of carbon steel shall not be allowed.
- Edge Grinding: After fabrication, sharp projections of cut or sheared edges of ferrous

metals shall be ground to a radius with a power grinder as required to ensure satisfactory coating adherence.

3.3 Filter media:

- Filter media shall consist of natural silica sand with a uniformity coefficient not exceeding 1.5 and should be prewashed and therefor free from silt & dust.
- The filter manufacturer shall provide specification and suggest suitable sand grain size required for successful filter operation.

4. Technical Specification of Units-

i) Dynasand Filter

- Continuous up-flow, moving bed, deep-bed sand filtration system operating without backwashing.
- Continuous filtration and continuous sand cleaning using filtered water without interruption of operation.
- Internal air-lift pump with pneumatic cabinet for continuous sand circulation and cleaning.
- Freestanding vertical filter fabricated in SS EN 1.4301/EN 1.4404 with modular filter sizes from 0.7 m² to 7.0 m².
- Designed for flow rates of 30-70 m³/hr (or higher as per requirement) with surface loading rate of 5-8 m/hr, extendable up to 25 m/hr depending upon influent quality.
- Filtered water quality shall achieve turbidity ≤ 0.2 FNU, colour < 5 mg Pt/l and residual aluminium < 0.1 mg/l.

ii) Nano Bubble Aeration System

- Reactive Nanobubble with Ozonation system suitable for 150 KLD WTP.
- System capacity shall be 16 m³/hr with 50 g ozone generator or as recommended by the OEM.
- Nanobubbles shall be of size less than 200 nm for efficient gas transfer and dissolved oxygen enhancement.
- System shall improve oxidation, disinfection and residual ozone concentration for enhanced water quality.
- MOC shall be MS/SS with 6" $\times$ 4" HMI display interface.

iii) Ultrafiltration (UF) System

- PLC-based Ultrafiltration system of 16.6 m³/hr permeate capacity complete with feed pumps, backwash/CIP pumps, UF modules, pneumatic/solenoid valves, compressor, flow meter and electrical panel.

- Hollow fibre PVDF membranes with pore size ranging from 0.01-0.1 micron, membrane area of 99 m² and output of 16.6 m³/hr.
- UF system shall include automatic backwash, CIP arrangement, micron filter, NaOCl & acid dosing system, twin lobe air blowers, piping, valves and powder-coated MS skid.
- System shall consistently remove suspended solids, colloids, bacteria and viruses and provide suitable pre-treatment for RO.

iv) Reverse Osmosis (RO) System

- RO system comprising raw water feed pumps, high-pressure pumps, spiral wound thin film composite membranes, dosing systems, micron filters, CIP system, RO skid and PLC-based control panel.
- High-pressure pumps shall be SS316 vertical multistage centrifugal pumps with suitable duty for the plant capacity.
- RO membrane shall be 8" × 40" spiral wound thin film composite with FRP membrane housing and complete instrumentation.
- System shall include Sodium Hypochlorite, Antiscalant and pH correction dosing systems, CIP tank and pump, flow meters, pressure gauges, conductivity meter, pH meter, pressure switches, level switches, SDI kit and PLC control system.
- RO system shall remove dissolved salts, particles, colloids, organics, bacteria and pathogens for production of potable water.

5. Technical Specification of Pipe & Fittings:-

i) GI Pipes, GI Fittings and Valves:

- All pipes inside the buildings and where specified, outside the building shall be galvanized steel tubes conforming to IS: 1239 of Class specified in BOQ. When Class is not specified in BOQ they shall be Heavy Class.
- Fittings shall be of malleable galvanized or as per IS: 1879 (part I to X) of approved make. Each fitting shall have manufacturer's trade mark stamped on it. Fittings for G.I pipes shall include couplings, bends, tees, reducers, nipples, unions, bushes etc.
- Pipes and fittings shall be jointed with screwed joints using Teflon tape suitable for water pipes. Care shall be taken to remove burr from the end of the pipe after cutting by a round file. All pipes shall be fixed in accordance with layout and alignment shown on the drawings. Care shall be taken to avoid air pockets. Necessary vents and drains shall be provided at all high and low points respectively. No pipes shall be run inside a sunken floor as far as possible. Pipes may be run under the ceiling or floors and other areas as shown on drawings.

ii) Clamps

- G.I pipes in shafts and other locations shall be supported by G.I clamps of design approved by the Engineer-In-Charge. Pipes in wall chases shall be anchored by iron hooks. Pipes at ceiling level shall be supported on structural clamps fabricated from MS structural. Pipes in shafts shall be supported on slotted angles/ channels as specified/ as directed.
- All pipe clamps, support, hangers shall be factory made galvanized MS steel or alternatively galvanized after fabrication to suit site requirement.

iii) Unions

- Contractor shall provide adequate number of unions on all pipes to enable easy dismantling later when required. Unions shall be provided near each gunmetal valve, stop cock or check valve and on straight runs as necessary at appropriate locations as required for easy dismantling and/ or as directed by Engineer-In-Charge.

iv) Flanges

- Flanged connections shall be provided on pipes as required for maintenance/ ease in dismantling or where shown on the drawings, all equipment connections as necessary and required or as directed by the Engineer-In-Charge. Connections shall be made by the correct number and size of the GI nuts/ bolts as per relevant IS Standards and made with 3mm thick insertion rubber washer/ gasket. Where hot water or steam connections are made insertion gasket shall be of suitable high temperature grade and quality approved by the Engineer-In-Charge. Bolt hole dia for flanges shall conform to match the specification for CI sluice valve as per IS:780. Gaskets shall conform to IS:11149.

v) Trenches

All G.I pipes below ground shall be laid in trenches (as per CPWD specification) with a minimum cover of 600mm. The width and depth of the trenches shall be as follows:-

Dia of pipe	Width of trench	Depth of trench
15mm to 50mm	300mm	750mm
65mm to 100mm	450mm	1000mm

vi) Sand Filling

- GI pipes in trenches shall be protected with fine sand 150mm all around before filling in the trenches.

vii) Painting

- All pipes above ground shall be painted with one coat of red lead and two coats of synthetic enamel paint of approved shade and quality to give an even shade. Pipes shall be painted to standard colour code specified by the Engineer-In-Charge.

viii) Pipe protection

- Where specified in the schedule of quantities all pipes in chase below ground shall be protected against corrosion by applying two coats of bitumen paint wrapping with polythene tape and finishing with one more coat of bitumen paint.

ix) Piping Installation

- Tender drawings indicate schematically the size and location of pipes. The contractor on the award of the work, shall prepare detailed working drawings, showing the cross-section, longitudinal sections, details of fittings, locations of isolating and control valves, drain valves and all pipe support, structural supports. He must keep in view the specific openings in buildings and other structures through which pipes are designed to pass.
- Piping shall be properly supported on or suspended from clamps, hangers as specified and as required. The contractor shall adequately design all the brackets, saddles, anchors, clamps and hangers and be responsible for their structural sufficiency.
- Pipe supports shall be of galvanized steel, adjustable for height and primer coated with rust preventive paint and finish coated back. Where pipe and clamps are of dissimilar materials a gasket shall be provided in between. Spacing of pipe supports shall not exceed the following:
- Pipe size and maximum support spacing will be as per CPWD specification.
- Vertical risers shall be parallel to walls and column lines and shall be straight and plumb. Risers passing from floor to floor shall be supported at each floor by clamps or collars steel structural supports attached to pipe and with a 15 mm thick rubber pad or any resilient material. Where pipes pass through the terrace floor, suitable flashing shall be provided to prevent water leakage. Risers shall have a suitable clean out at the lowest point and air vent at the highest point.

- Pipe sleeves, 50 mm larger diameter than pipes, shall be provided wherever pipes pass through walls and slabs, and annular space filled with fiberglass and finished with retainer rings.
- All pipe work shall be carried out in a workmen like manner, causing minimum disturbance to the existing services, buildings, roads and structure. The entire piping work shall be organized in consultation with other agencies work so that particular area work shall be carried out in one trench.
- Cut outs in the floor slab for installing the various pipes are indicated in the drawings. Contractor shall carefully examine the cut outs provided and clearly point out wherever the cut outs shown in the drawings, do not meet with the requirements.
- The contractor shall make sure that the clamps, steel structural supports, brackets, clamp saddles and hangers provided for pipe supports are adequate. Piping layout shall take due care for expansion and contraction in pipes, and include expansion joints where required.
- All pipes shall be accurately cut to the required sizes in accordance with relevant codes and burrs removed before laying. Open ends of the pipes shall be closed as the pipe is installed to avoid entrance of foreign matter. Where reducers are to be made in horizontal runs, eccentric reducers shall be used for the piping to drain freely. In other locations, concentric reducers may be used.
- Pump suction and delivery headers shall be galvanized iron pipes (heavy class) confirming to IS 1239 with matching fittings. The pipe joints shall be threaded as per manufacturer's instructions.

x) Vibration Eliminators

- Provide on all suction and delivery lines as of pumps shown on the drawings double flanged reinforced neoprene flexible pipe connectors. Connectors should be suitable for a working pressure of each pump and tested to the test pressure given in the relevant head. Length of the connectors shall be as per site requirements in accordance with manufacturer details.

xi) Valves

- Butterfly Valves :

All valves 65 mm dia and above shall be C.I. slim seal butterfly valves. Butterfly valves shall be of best quality conforming to I.S. 13095 of class specified.

- Non-Return Valves (Check Valves) :

Non-return valves shall be cast iron dual plate type with cast iron body and gunmetal internal parts conforming to IS: 5312.

6. General Technical specifications of water treatment equipments

i) Dual Media Pressure Sand Filter /Activated Carbon Filter

- Filter shall be designed in accordance with the code of unfired pressure vessel conforming to I.S.
- 2825.
- Filter shall be Dual media pressure sand filter/activated carbon filter may be altered to suite contractor's own design of the most efficient performance.
- Filters shall be vertical type of required diameter. The shell and dished ends shall be fabricated from
- M.S. sheet. Tank suitable to with stand a working pressure given in Bill of Quantities. The shell shall have a minimum thickness of 6 mm thick shell and 8 mm thick dished ends mentioned in BOQ or as per manufacturer recommendations.
- Each filter shall have at least one pressure tight manhole cover for inspection and repairs.
- Each filter shall be provided with screwed or flanged connections for inlet, outlet individual drain connections and all face piping, valves and all other connections necessary and required.
- Each filter shall be provided with manually operated and controlled assemblies valve.
- Face piping shall be GI. (Heavy Duty)

General requirement of Filter Water

Turbidity : < 2 NTU

Colour: Unobjectionable

Taste : Unobjectionable

Odour : Unobjectionable

Residual Chlorine : 0.2 PPM (Minimum)

ii) Chemical Dosing Pump :

- Chemical dosing system comprising of metering pump, 100 lts. Capacity FRP / HDPE solution tank with level gauge and lid on top.
- Motor driven metering pump with mechanically activated diaphragm with oil lubricated gear mechanism. The output of the pump should be adjustable operation from 10-100%. Pump construction shall be corrosion resistant polypropylene or similar material dosing pump shall be used.
- Each pump shall be provided with an injector assembly with suction and delivery piping complete in all respects.

iii) Pipe And Fittings (For Headers And Connections)

Pump suction and delivery headers shall be of approved corrosion resistant material with matching fittings. The pipe joints shall be threaded or as manufacturer's instructions.

iv) Valves

- Valves 65 mm dia and above shall C.I. Slim Seal butterfly valves (PN 16).
- Valves up to 50 mm dia shall be ball valve.
- Non return valve shall be CI dual plate type non return (PN 16).

v) Water Softener :

- Softeners shall be designed in accordance with the code of unfired pressure vessel conforming to I.S.2825.
- Softeners shall be designed to give required hardness. Softener shall provide with suitable grade of Cation exchange resins in quantity to be indicated by the contractor at the time of tendering.
- Softener vessel shall be fabricated from MS sheet with dished ends and self-supporting arrangement.
- Vessel shall be suitable for a working pressure given in bill of quantities. The shell shall have a minimum thickness of 6 mm and dished ends 8 mm mentioned in BOQ or as per manufacturer recommendation.

- The vessel shall have an internal collecting and distribution system of manufacturer's design.
- Softener shall have a set of face piping for inlet, outlet brine injection with all valves. Suitable drain shall be provided. Pipes shall be GI/MS class 'C'.
- One set of hydraulic injector with control valve, brine delivery pipes with adjustable indicating lamps.
- One cylindrical FRP saturator and mixing tank, provided with brine delivery piping with adjustable level indicating clamp and control valves complete. The tank shall be of capacity as given in the schedule of quantities.
- One orifice board for indicating wash and rinse rate to be filtered in drain sump.
- One charge of supporting gravel, sand and "Cation" resin in requisite quantity.
- One water testing kit with instructions for testing water samples.

vi) Flow measurement

- Provide Rota meter reading "LPH" or "LPM" on delivery line of the plant.
- Provide one direct reading flanged type water meter with strainer on outlet of water softener or water filter.

7. Technical Specification for water supply and drainage Pumps:

7.1 Pumping Sets for Filter Feed Pumps:

- Water supply pumps shall be suitable for Raw / clean filtered water. Pumps shall be single stage, horizontal centrifugal pumps (as mentioned in BOQ) with C.I casing and Bronze / SS 304 impeller, stainless steel shaft of SS 316, mechanical seal and coupled to a TEFC electric motor. Each pump should be operating to a curve required by the operating conditions.
- All parts in contact with water shall be corrosion resistant stainless-steel DIN-Nr.1.4401.
- Each pump shall be provided with a totally enclosed fan cooled induction motor of suitable H.P. The motors shall be suitable for 400/440 volts, 3 phase, 50 cycles A.C. power supply and shall conform to IS 325 operating at 2900 RPM nominal speed.

- Each pumping set shall be provided with 100-mm dia/150 mm dia gunmetal “Bourdon” type pressure gauge with gunmetal Isolation Cock/ball valve and connected piping.
- Pump or the whole set shall be stable on rubber vibration eliminating pads appropriate for each pump.

7.2 Variable Speed & Fixed Speed Hydro pneumatics Booster System:

(A) System Descriptions:

- a) The variable speed booster system shall be supplied and installed as designed.
- b) The system shall comprise of number of pumps, as mentioned in BOQ, in parallel and it shall be a package system manufactured by the manufacturer of the pumps at their factory.
- c) The system shall consist of :-
 - Vertical In Line Multistage Centrifugal pumps. The quantity shall be as per BOQ.
 - Variable Frequency Drives (VFD). The quantity shall be as per BOQ.
 - Pre-pressurized bladder or diaphragm type pressure vessel complete with pre-charged nitrogen gas to the design pressure settings.
 - Control panel complete with MCCB, MCB, fuses, microprocessor based dedicated Pump Logic with built in graphical display of VGA 240 x 320 pixels.
 - Pipe work and valves, pressure transmitter, pressure gauge, check valve, ball valve/gate valve and all necessary fittings etc. to the satisfactory operation of the system and to make system as complete. Only supply & delivery line will be connected to start the system

(B) Components of Variable Speed Booster :

I. Pumps and motors:

a) Pumps

- The pump shall be of approved make of vertical, non -self priming, multistage, in-line centrifugal type suitable for speed up to 2900 rpm.
- The suction and discharge port shall be in line with each other. The maximum

- operating liquid temperature for the pump shall be up to 120 deg C.
- The motors shall be vertically stool mounted on top of the pump casing and the pump casing shall be designed to take the dynamic load of the motor. The motor shall be provided with thrust bearing to cater for the downward thrust of the pump.
- Impeller and intermediate chamber shall be made of stainless steel DIN W Nr. 14401, AI SI 316.
- Pump housing should be made of stainless-steel DIN W. Nr 14408, AI SI 351.
- Pump head and base shall be as per as mentioned in BOQ.
- Pump shall be equipped with maintenance free mechanical shaft seal of cartridge design and should have assembly length according to EN 12756.
- Power transmission shall be via Cast Iron split coupling.
- Pipe work connection shall be via DIN flanges.
- For optimum efficiency, the impeller of all welded, laser welded type to avoid inter stage leakage, spot welding of impeller will not be acceptable.

b) Pump Selection :

- Each pump shall have the stable characteristics and the operating point shall fall within the acceptable range on the pump curve. Duty point should not be selected at extreme right or left side of the curve. The pump performance curve shall be complying with the tolerance according to ISO 9906.

c) Pump Head and Base :

- Pump head and base should be made of SS-304 as mentioned in BOQ.
- The motor terminal housing shall be of a completely watertight design with tight cable glands to prevent ingress of water. For bigger motor, the housing shall have provision for the lubrication of the motor bearing to enable the pump to run effectively with only periodic withdrawal for maintenance and lubrications, if required.
- For motor sizes more than 7.5 kw, extended coupling should be provided to enable the changing of the mechanical shaft seal without the need to lift up or dismantling of the motor. For pumps up to 7.5 Kw mechanical seal should be changeable without dismantling/opening pump.

d) Shaft, Impeller and Guide Vanes :

- All the inter stage components (impeller, intermediate chambers, diffusers) as well as sleeves and guide vanes shall be made of stainless steel DIN.
- The impeller shall be fitted to a rounded shaft with split cone and split cone nut to prevent the stages of the pump been collapsed. For smaller pumps splined shaft is acceptable.

e) Mechanical Seal :

- The mechanical shaft seal shall be of cartridges type with seal faces of silicon carbide material.
- It should be possible to change mechanical seal without opening the pump to reduce downtime.

f) Motor:

- The electric motor shall be of TEFC design, with operating speed of 2900 RPM suitable for operation on a 400/440Volts / 3 phase/ 50 Hz voltage supply.
- The motor shall meet IEC/NEMA and EPACT 92 (where applicable) specifications.
- All motors shall be sized for pump operation based on non-overloading conditions for the full QH curve. The motor shall also be suitable for at least 40 start/stop per hour.
- Direct on line starting method is required for motor up to 5.5 Kw and soft starting is required from 7.5 Kw onwards.
- Maximum noise level should be 72 db at 1 meter level.
- Motors enclosure class shall be comply with IEC 60034-5.
- Motors should be protected against external mechanical impacts according to IK-code (International Mechanical protection) in DS/EN 50102.
- Motors should be cooled according to IEC 60034-6.
- Rated bearing life of motor shall be of L 10 grade.
- Temperature rise of motor shall be confirmed to class B.
- Vibration level of motor should be according to ISO 10816. Motor having RMS

vibration speed more than 2-8 mm /sec will not be acceptable.

- Motor shall be with double lock drive end bearing to withstand high thrust.
- All motor should be of minimum Class - I efficiency (IE3).

II. Variable Frequency Drives (VFD):

VFD shall be Pulse Width Modulation (PWM) type, microprocessor controlled design labelled as CE. Drive shall have modifiable adjustments of 2 to 600 seconds accel & decel time, Minimum & Maximum frequency, V/I ratio and Carrier frequency. Speed reference signal shall be customer selectable for 4-20 mA, 0-5 VDC and 0-10 VDC. The VFD shall be suitable for elevations up to 1005 meters above sea level without de-rating. Maximum operating ambient temperature shall be to 50 Deg C. shall be suitable for environment condition up to 95% non-condensing.

- Built-in DC link filters to avoid power factor correcting devices like Capacitors, line reactors etc.
- Energy saving mode with boost function (Sleep/ Wake Mode), Quick set up menu.
- VFD should be mounted inside the panel cabinet.

III. Dedicated Programmable Logic Controller (PLC) :

Pump Logic controller:

- Multi Pump Controller shall be listed by and bear the label of Underwriter's Laboratory Inc (UL). The controller shall be specifically designed for variable speed pumping applications
- Pump logic controller in built in Variable frequency drives are not accepted. Logic controller should be external to the drives used in the system

Multi Pump Controller shall have programs to safeguard the system against the following conditions Pump flow surges

- System Hunting
- End of curve protection
- Multi Pump Controller shall be capable of controlling up to six pumps in parallel.
- Multi Pump Controller shall be capable of accepting an additional analog input signal from a flow sensor. This input shall be used for the end of curve protection
- Multi Pump Controller shall be capable of accepting 7 different set points activated through either clock program or individual digital inputs

- Multi Pump Controller shall be capable of accepting additional analog input as external set point influential signal to vary the primary analog input signal. This external set point influential signal shall be user selectable from various types of signals like ambient temperature signal or like
- Multi Pump Controller shall have program function to accept the pump curve data for optimizing the system performance in terms of energy consumption for the pump being controlled
- Multi Pump Controller should have self-learning functions for optimizing the number of pumps based on energy consumption
- The hydraulic stabilization program shall utilize a proportional-integral control function. The proportional-integral values shall be user adjustable in the Multi Pump Controller over a finite range.

Multi Pump Controller shall be self-prompting and all alarm messages shall be displayed in plain English. The operator panel shall have the following features:

- Multi fault memory and recall of last 24 faults with time stamping.
- Red fault light with related alarm message on default screen with graphical representation of the fault
- Soft touch membrane keypad switches
- Multi Pump Controller shall have a display screen size of minimum 320 pixels X 240 pixels VGA display with backlight. Current status of settings and measured values are to be displayed in the default screen
- Multi Pump Controller shall have an installation wizard to enable the user to configure the system with minimum assistance
- Multi Pump Controller shall have minimum 2 level password protection to safeguard the settings against unwanted / unauthorized changes
- Display should have menu driven function for the operation easiness
- Low suction pressure cut out to protect the pumps against operating with insufficient suction pressure
- High system pressure cutout to protect the piping system against high-pressure conditions
- Soft pressure built up function for smooth start of the system for filling the instance empty pipes.
- The pilot pump selection should be provided for reducing main pumps operating hours when low flow condition.
- Approved Multi Pump Controller The pump logic controller shall be housed in a NEMA 1 enclosure
- On board Ethernet port should be the controller.

IV. Control Panel :

Control cabinet with an IP 41 enclosure of suitable rating (or specified optional cabinet)

with the keypad and display screen mounted through the outer door. In addition to the electronic pump controller, the control cabinet shall include VFD, circuit breakers for each pump and the control circuit, control relays for alarm functions and fuses.

Control cabinet shall include the following, but not be limited to:

- Motor protection
- Dry run protection - Float switch / Inlet pressure monitoring device for suction lift condition
- Ethernet connectivity (Web based control)
- 320 X 240 pixels VGA display with adjustable backlight
- Pump Fault Lights - A Red light for fault indications
- Visual Alarm
- Manual Operation

V. Hydro Pneumatic Pressure Tank:

The hydro-pneumatic tank shall be of Butyl, Double diaphragm bladder type with pre-pressurized air/nitrogen. It shall be capable of handling the designed effective system protection (ESP) Volume to protect pump and operating controls by ensuring that the actual pump operation conform to the manufacturer's specified minimum running time and maintaining the designed pressure range.

- MS Tank body
- Maximum liquid temperature - 70deg C
- Pre-charge Pressure - 1.5 bar
- Pressure tank size shall be recommended by System Manufacturer.
- The diaphragm/membrane shall be of heavy-duty type. This diaphragm/membrane should be the only component in contact with the liquid.
- The tank shall have a maximum operating pressure of 10 bars and shall be able to handle a maximum liquid temperature of 90oC.

VI. Pressure Transmitter:

Pressure transmitters shall be field mounted and shall transmit an isolated 4-20mA DC signal indicative of process variable to the Programmable logic controller via standard two wire 24V DC system. Unit shall have stainless steel wetted parts and it should be installed at the discharge header. It should have watertight, electrical enclosure capable of withstanding minimum 10 bar static pressure.

VII. Headers & Accessories:

- The suction and discharge manifolds shall be in G.I. 'Heavy' class as mentioned in BOQ. Delivery manifold shall include a suitable range of pressure gauge. The discharge manifold shall include a socket to install a pressure transducer with a 4-20mA output. The pressure transducer shall be factory installed and wired. Manifold and valves are suitable for PN 16 pressure rating. DIN Standard flange connection.
- Isolation valves shall be installed on the suction and discharge of each pump. A Non Return Valve/ check valve shall be installed on the discharge of each pump. Base frame and panel side supports should also be made of galvanized sheet.

(C) Booster System Working :

- The system shall be under the control of a microprocessor based programmable logic controller (PLC). 2 nos. of pressure transmitter (primary and standby) shall be incorporated into the system to detect the pressure at the discharge manifold and feedback to the PLC.
- The system shall maintain a constant pressure at all times regardless of the system demand. The activation of the next duty pump in a high demand situation shall not be based on a different set point. However the PLC should have a flow test function to determine the numbers of pumps in operation and a stop function into the controller to stop all pumps from operation, whenever there is no demand, which prevents and reduces wear and tear of the system as well as reduces energy consumption. The controller shall also ensure alternation of all pumps for even running hours.
- The lead pump shall operate when the system pressure reduces to the preset point. If demand escalates, the lag pumps shall commence operation as required. During next operation lead pump becomes lag and lag pump becomes lead pump automatically. The system shall vary the frequency of each pump (in case of multi VFD system) and it will be equalized to ensure smooth operation to meet the specific demand. Under decreasing hydraulic demand, the reverse to the above description shall apply.
- **Operations**
The control circuit shall enable automatic and manual operations of the system.

a) Automatic Operation

Everything will be controlled by PLC in this case including the levels of all water tanks.

b) Manual Operation

- Either one or all pumps shall be capable of being started and stopped by their respective push buttons or MCB's.
- The control panel should have starters for this purpose

7.3 Submersible pumps:

- Submersible pumps for drainage/sewage/storm water drainage shall be single stage, single entry pump. Pump shall be with dynamically balanced impeller connected to a common shaft to the motor. The vane for sewage pump will be open type, while for drainage pump, etc. it will be of semi open type.
- Stuffing box shall be provided with mechanical seals.
- Each pump shall be provided with water cooled squirrel cage induction motor suitable for 415 volts, 3 phase, 50 cycles A.C. power supply.
- Each pump shall be provided with liquid level controller for operating the pump between predetermined levels.
- The pumping set shall be for stationary application and shall be provided with pump connector in it.
- The delivery pipe shall be joined to the pump through a rubber diaphragm, and bend and guide pipe for easy installation, without disturbing delivery pipe the pump unit shall have a back pull-out design. A rust proof chain shall be provided for each pump.
- Pump shall be provided with all accessories and devices necessary and required for the pump to make a complete working system.

7.4 Level controllers:

- Level controllers shall be electronic low voltage type using required number of stainless-steel type probes, shrouded in PVC sheath or encapsulated in a stainless-steel pipe.

8. Specifications for Electrical Installations

Work shall be carried out in accordance with the specifications, Indian Electricity Act 1910 as amended upto date, and rules and regulations of local electricity authority and Indian Standard Code of practice latest as applicable.

8.1 MV Switchgears/Panels/Sub-Panels/Distribution Boards:

System Rating:

- All the Main MV switchgears/Panels/Motor control centers shall be suitable for operation on three phase/ single phase, 415/230 volts, 50 Hz neutral solidly grounded at transformer and short circuit level not less than 50 kA /35 kA at 415

Volts.

- The Distribution boards shall be designed to withstand heaviest condition at site, with maximum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.

8.2 Standards and Codes (latest as applicable):

The codes shall be complied with the latest edition of relevant Indian Standards and Indian Electricity Rules and Regulations. The following Indian Standards shall be complied with:

- IS 1394 - L.V. switchgear and control gear Part-I Part I -1993 General rules.
- IS 5578-85 Guide for marking of insulated conductors.
- IS 11353-85 Guide for uniform system of marking and identification of conductors and apparatus terminals.
- IS 2147-62 Degree of protection provided by enclosures for low voltage switch gear and control gears.
- IS: 2675-83 Enclosed distribution fuse boards and cutouts for Voltages not exceeding 1000 V.
- IS 2551-82 Danger notice plates.
- IS 13947-1993 Circuit breakers. (Part-II)
- IS 13947-1993- Switches, Disconnectors, switch disconnector (Part-III) and fuse combination units.
- IS 1818-72 Alternating current isolators (disconnectors) and earthing switches.
- IS 8623-77 Factory built assemblies of switchgear and control gear for voltages upto and including 1000 V AC & 1200 V DC.
- IS 8828- Miniature air break circuit breakers for voltages not exceeding 1000 V.
- IS 9926 Fuse wires used in rewirable type Electric fuses upto 650 Volts.
- IS 2208 HRC fuse links

- IS 2705 (Part- I, II & III) Current Transformers IS 3156 (Part- I, II & III) Voltage Transformers IS 1248 Indicating Instruments
- IS 13947-93(Part - 5) Control devices and switching elements. Section-1
- IS 13947-93 (Part - 4) Contactors and motor starter section 1 Section-1 Electromechanical.
- IS 3231 Relays
- IS 375 Marking and arrangement of bus-bars Indian Electricity Act and Rules.

8.3 Shop Drawings:

Prior to fabrication of the Switchgears, Distribution boards, the contractor shall submit for approval the shop drawing, and design calculations, indicating type, size, short circuit rating of all the electrical components used, details & schedule of components & model Nos. type, rating etc., busbar size, internal wiring size, Distribution board dimension, colour, mounting detail etc., The contractor shall submit manufacturer's catalogues of the electrical components installed in the distribution.

8.4 Test Certificates:

Testing of Distribution boards shall be carried out at factory and or at site as specified in Indian Standards in the presence of Construction manager/Client/Engineer s the test results shall be recorded on prescribed forms. The test certificates for the test carried out at factory or at site shall be submitted in six copies to the Construction manager/Client/Engineer for approval.

8.5 Construction Features:

- The power supply and control panel shall be metal enclosed sheet steel cubical indoor type, dead front, floor mounting/wall mounting type. The panel shall be totally enclosed, completely dust and vermin proof, Gaskets between all adjacent units and beneath and all covers shall be provided to render the joints dust proof. These Panels shall be arranged in multitier formations. All doors and covers shall be lockable.
- All mild steel sheets used in the construction of panels shall be 2mm thick and shall be folded and braced as necessary to provide a rigid support for all components. Joints of any kind in sheet metal shall be seam welded, all slag grounded off and welding pits wiped smooth with plumber metal.
- All panels and covers shall be properly fitted and square with the frame, and holes

in the panel correctly positioned. Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with check nuts. Self-threading screws shall not be used in the construction of control panels. Base channel shall of 75mm x 75mm x 5mm thick shall be provided at the bottom. Minimum clear space of 200mm between the floor of panel and bottom most units shall be provided.

- The panels shall be of adequate size with a provision of 25% spare space to accommodate possible future additional switchgear. Knockout holes of appropriate size and number shall be provided in the control panels in conformity with the location of incoming and outgoing conduits/cables, all equipment such as meters and indicating lamps, etc shall be located adjacent to the unit with which it is associated and care shall be taken to achieve a neat and symmetrical arrangement. Facility shall be provided for termination of cables from both above and below the control panel. Where cables enter below, cables boxes shall be fitted at the rear and arranged in tiers to facilitate making connections to the upper and lower units. Clamps shall be provided to support the weight of the cables. All incoming and outgoing feeders shall be brought out to a terminal block of adequate size at suitable location inside the control panel. All wiring inside the control panel shall be colour coded and labelled with ap- proved plastic beads for identification. Circuit diagrams showing the arrangement of circuits shall be pasted on the inside of the panel door and covered with transparent plastic sheet and all labeling shall be provided on the front face of the panel board.

8.6 Circuit Compartments:

Each circuit breaker, contactor and relay shall be housed in a separate compartment and shall be enclosed on all sides. Sheet steel hinged lockable door shall be duly interlocked with the breaker in the 'ON' position. Safety interlocks shall be provided to prevent the breaker or Contactor from being drawn out when the breaker is in ON position. Instruments and indicating lamps shall not be mounted on the panel compartment door. Sheet steel barriers shall be provided between the tiers in a vertical section.

8.7 Instrument Compartment:

Separate and adequate compartments shall be provided for accommodating instruments, indicating lamps, control contactors and control fuses etc. These shall be accessible for testing and maintenance without any danger of accident contact with live parts of the circuit breaker and bus bar.

8.8 Bus Bars and Bus Bar Connection:

- The bus bar and interconnections shall be of Aluminium and of rectangular cross sections suitable for full load current for phase bus bars and half rated current for

neutral bus bars and shall be extensible on either side. The bars and interconnections shall be insulated with PVC sleeve tapes and colour coded. All bus bars shall be supported on unbreakable, non-hygroscopic insulated supports at regular intervals, to withstand the forces arising in case of short circuit in the system. Bus bars shall be provided in separate chamber main control panels shall be done by clamping, no holes shall be drilled in bus bars. If holes have to be drilled for making connections, extra cross section of busbars shall be provided.

- All bus bar connections in smaller control panels shall be done by drilling hole and connecting by brass bolts and nuts. Additional cross section of bus bars shall be provided in small control panels to cover up the holes drilled in the bus bars.
- All connections between the bus bar and breaker and between breaker and contactor, shall be through aluminium strips of proper size to carry full rated current and shall be insulated with PVC sleeves.

8.9 Terminals:

The outgoing terminals and neutral links shall be brought out to a terminal block suitably located in the control panels. The current transformer for instruments, metering and for protection shall be mounted on the bus bars. Separate cable compartment shall be provided for incoming and outgoing cables.

8.10 Wire Ways:

A horizontal wire way screwed covers shall be provided at the top to take in the connecting control wiring different vertical sections.

8.11 Cable Compartments:

Cable compartments of adequate size shall be provided in the control panels for easy termination of all incoming and outgoing cables entering from bottom or top. Adequate and proper supports shall be provided in cable compartments to support cables. All incoming and outgoing terminals shall be brought out to terminal blocks in the cable compartment.

8.12 Materials:

All materials shall be of the best quality complying with the appropriate Indian Standard specifications, Materials used shall be subject to the approval of the Client/Engineer and sample of the same shall be furnished where required.

8.13 Moulded case circuit Breaker (MCCB): -

MCCBs shall satisfy the requirements of IS-2516 and shall be of current limiting type. MCCB shall provide type 'C' protection to the contactors as per IEC 158-1B. MCCBs shall be quick make, quick break, independent manual type with trip free feature with mechanical ON, OFF, and TRIP indications. A trip button shall be provided for tripping the breaker.

8.14 Rotary Switches:

Switches upto 60 amps shall be rotary type with compact and robust construction, built up from one or more stacks with contacts and a positioning mechanism, with stop as required. The terminals shall be shrouded with insulation to prevent accidental contact with live parts. Rotary switches shall be backed up with moulded type HRC fuse fittings of appropriate rating.

8.15 Selector Switch:

When called for, selector switches of rated capacity shall be provided in control panels, to give the choice of operating equipment in selective mode.

8.16 Switches:

Switches beyond 60 amps shall be panel mounted double break type and suitable for load break duty, quick make and break action, manufactured in accordance with IS: 4047 - 1967. Switch contacts shall be silver plated and shall be backed up with HRC fuses of appropriate rating. The switch handles shall be located at the front.

8.17 HRC Fuses:

Fuses shall be high rupturing capacity and shall be in accordance with IS: 3208 - 1962 and having rupturing capacity of not less than 20 MVA at 415 volts. The back up fuse rating of each motor/heater/equipment shall be so chosen that the fuse does not operate on starting of motor/heater/equipment. Fuses shall be of the same make as the switches.

8.18 Starters:

- Each motor shall be provided with a starter of suitable rating. Starter shall be in accordance with IS: 1822 - 1967. Direct on line starters shall be provided for motors.
- All starters shall have auxiliary contacts for interlocking, control & indication. Starters (contactors) shall have 3 main and 4 auxiliary contacts and shall be air break type suitable for making and breaking contact a minimum power factor of 0.35. For design consideration of contactors, the starting current of connected

motor shall be assumed to be 6 times the full load current of the motor in case of direct-on- line starters and 3 times the full load current of the motor in case of star delta/reduces Voltage starters. In case of soft starters, the current shall be limited to 1.8 times.

- Main and auxiliary contacts shall be silver or silver alloy. The insulation for contactor coils shall be of class "E". Operating coils of contactors shall be suitable for $230 \pm 10\%$ volts AC, 50 cycles supply system. The contactor shall drop out when voltage drops to 90% of the rated voltage. The housing of the contactors shall be heat resistant and having high impact strength. Each starter shall have thermal overload protection on all three phases.

8.19 Overload Relays:

- Contactors shall be provided with a three element, positive acting ambient temperature compensated time lagged hand-reset/self-reset type thermal overload relay with adjustable setting. Hand reset button shall be flush with the front door for resetting with starter compartment door closed, Relays shall be directly connected for motors below
- 35 HP capacity. C.T. operated relays shall be provided for motors above 35 HP capacity. Heater circuit contactors may not be provided with overload relays.

8.20 Current Transformers:

Current Transformer shall be of minimum accuracy class 1.5 and suitable VA burden for operation for the connected meters and relays.

8.21 Single Phase Preventers:

Single phase preventers shall be provided as per schedule of quantities and shall be in conformity with relevant ISI standards. Single phase preventers shall act when the supply voltage drops down to 90% of the rated voltage or on failure of one or more phases.

8.22 Time Delay Relays:

Time delay relays shall be adjustable type with time delay adjustment from 0-180 seconds and shall have one no. auxiliary contacts for indicating lamp connection.

8.23 Indicating Lamp and Metering:

All meters and indicating lamps shall be in accordance with the relevant ISS. The meters

shall be flush mounted and draw out type. The indicating lamp shall be neon type and of low burden. Each main panel shall be provided with operated ammeter of suitable range with three Nos. CTs of suitable ratio with three way and off selector switch, phase indicating lamps, and other indicating lamps as called for. Each phase indicating lamp shall be backed up with 5 amps fuse and toggle switch. Other indicating lamps shall be backed up with fuses as called for.

8.24 Toggle Switch:

Toggle switches, where called for, shall be in conformity with IS: 3854-1969 and shall be of 5 Amps rating.

8.25 Push Button Stations:

Push button station shall be for manual starting and stopping of motors/equipment as called for. Red and Green colour push buttons shall be provided for starting and stopping operations. Start or stop indicating flaps shall be provided for push buttons. Push buttons shall be suitable for panel mounting/projection mounting and accessible from front without opening door, lock lever shall be provided for stop push button. One set of normally open and one set of normally closed contacts shall be provided in push button stations. The push buttons contacts shall be suitable for 15 Amps current capacity.

8.26 Cabling/Wiring System:

All power cabling shall be carried out with 650/1100-volt grade PVC insulated PVC sheathed, armoured, aluminium conductor cables laid on the cable tray/racks/pipes. Cables shall be sized for starting current and by applying proper derating factor. All control wiring shall be carried out by using 650/1100 volts PVC insulated copper conductor wires in wire ways or in conduit. Minimum size of control wiring shall be 1.5 sq.mm. Wherever control wiring in the Scope of AC contractor has to be done in conduits (exposed or concealed) no additional cost for conduiting shall be paid.

8.27 Cable Laying:

- Cable shall be laid generally in accordance with Indian Standard Code of practice. Cable shall be laid on 2 mm thick perforated M.S. sheet cable trays. Easy access to all cables shall be provided to allow cable withdrawal/replacement in the future. Where more than one cable is running, proper spacing shall be provided to minimize the loss in current carrying capacity.
- Cable shall be suitably supported with wooden cleats when run on wall/floor ducts. When buried, they shall be covered with a layer of fine sand and protected

with cement concrete tiles bricks. Special care shall be taken to ensure that the cable are not damaged at bends. The radius of bend of the cables when installed shall not be less than 12 times the diameter of the cable.

8.28 Cable/Wire/Starter Sizes:

- For all single phase/3 phase wiring, 650/1100 volts grade PVC insulated copper conductor wires shall be used. The equipment inside plant room shall be connected to the control panel by means of insulated aluminium conductor wires of adequate size in exposed conduits. Final connections to the equipment shall be through wiring enclosed in M.S. flexible conduits rigidly clamped at both ends.
- An isolator shall be provided near each motor/equipment wherever the motor/equipment is separated from the supply panel through a partition barrier of through ceiling construction. PVC insulated single strand aluminium conductor wires shall be used inside the control panel for connecting different components and all the wires inside the control panel shall be neatly dressed and plastic beads shall be provided at both ends for easy identification.
- The minimum size of control wiring shall be 1.5 sq.mm. PVC insulated stranded soft drawn copper conductor wires drawn through conduit to be provided for connecting equipment and control panels.
- All the switches, conductors, push buttons stations, indicating lamps shall be distinctly marked with a small description of the service installed. Circuit wiring diagram of control panel shall be fixed to the cover of control panel for verification.

9. EARTHING:

Shall be carried out with galvanized Iron Strips/wires, or copper strips /wires as specified below:

9.1 G.I. Earthing:

The main panel shall be connected to the main earthing system of the building by means of 32mm x 6mm GI strips. All single phase metal clad switches and control panels shall be earthed with minimum 3mm diameter GI conductor wire. All 3 phase motors and equipment shall be earthed with two numbers distinct and independent GI wires/tapes as follows:

- | | | |
|------|--|---------------------------|
| i. | Motors upto and including
10 HP rating. | Nos. 4mm dia GI wires |
| ii. | Motors 12.5 HP to 40 HP capacity. | 2 Nos. 6mm dia GI wires |
| iii. | Motors 50 to 75 HP capacity. | 2 Nos. 25 x 3mm GI strips |

All the switches shall be earthed with two numbers distinct and independent GI wires/tapes as follows:

- | | | |
|------|--|--------------------------------------|
| i. | 3 phase switches and control panels upto 60 Amps rating. | 2 Nos. 4mm dia GI wires |
| ii. | 3-phase switches and control panel 63 Amps to 100 Amps rating. | Nos. 8mm dia GI wires |
| iii. | 3 phase switches and control panels 125 Amps to 200 Amps rating. | 2 Nos. 25 x 3mm GI tapes. |
| iv. | 3 phase switches and Control panels, above 200 Amps rating | 2 Nos. 25mm x 6mm GI bus ducts tapes |

10. Drawings:

Shop drawings for control panels and wiring of equipment showing the route of conduit/cable shall be submitted by the electrical contractor for approval of Client/Engineer before starting the fabrication of panel and starting the work. The Fire Fighting contractor shall co-ordinate, interact and furnish necessary engineering information of the motor thermal curves, starting time, requirement of protection & interlocking & other miscellaneous requirement so that same can be incorporated before manufacture is taken up. On completion, four sets of completion "As-installed" drawings incorporating all details like, conduit routes, number of wires in conduit, location of panels, switches, junction/pull and cable route etc. shall be furnished by the Contractor.

11. Testing:

- Before commissioning of the equipment, the entire electrical installation shall be

tested in accordance with Code of practice IS: 732-1963 (Revised) & Indian Electricity Rule and test report furnished by a qualified and authorized person. The entire electrical installation shall be got approved by Electrical Inspector and a certificate from Electrical Inspector shall be submitted. All tests shall be carried out in the presence of Owner/his authorized representative. At the completion of the works, the entire installation shall be subject to following tests: -

- Wiring continuity checks with respect to approved wiring diagram.
- Insulation resistance test with 500V megger between phase to phase and phase to earth.
- Earth continuity test.
- Electrical current readings in Amps of full & average load running and starting together with name plate current of each electrical motor.
- Operating tests on all protective relays to prove their correct operation before energizing the main equipment including secondary injection test at site.
- Operating tests on all starters, circuit breakers etc.
- All tested and calibrated equipment's for testing, labour, materials and incidentals necessary to conduct the above tests shall be provided by the contractor at his own cost.

12. Painting:

All sheet steel work shall undergo a process of degreasing, through cleaning, and painting with a high corrosion resistant primer. All panels shall then be backed in an over the finishing treatment shall be by application of synthetic enamel paint of approved shade. The panels in the erection scope of Fire Fighting contractor shall be given 2 coats of suitable paint of approved colour when all work has been completed. Various feeder & panel name shall be painted with approved colour as per the single line diagram details.

13. Rejection of Plant

Any item of plant or system or component which fails to comply with the requirements of this Specification in any respect whatsoever at any stage of manufacture, test, erection or on completion at site may be rejected by the Engineer-In-Charge either in whole or in part as he considers necessary/appropriate. Adjustment and/or modification work as required by the Engineer-In-Charge so as to comply with the Authority's requirements and the intent of the Specification shall be carried out by the Contractor

at his own expense and to the satisfaction of the Engineer-In-Charge.

After works have been accepted, the Contractor may be required to carry out assist in carrying out additional performance tests as reasonably required by the Engineer-In-Charge.

14. Commissioning & Testing:

(A) Handing over:

- All commissioning and testing shall be done by the contractor to the complete satisfaction of the Engineer-In-Charge, and the job handed over to the Engineer-In-Charge, or his authorized representative.
- Contractor shall also handover, to the Engineer-In-Charge, all maintenance & operation manuals and all other items as per the terms of the contract.

(B) Guarantees:

The contractor shall submit a warranty for all equipment, materials and accessories supplied by him against manufacturing defects, malfunctioning or under capacity functioning.

The form of warranty shall be as approved by the Engineer-In-Charge.

The warranty shall be valid for a minimum period of one year from the date of commissioning and handling over.

The warranty shall expressly include replacement of all defective or under capacity equipment.

The warranty shall include replacement of any equipment found to have capacity lesser than the rated capacity as accepted in the contract. The replacement equipment shall be approved to the Engineer-In-Charge.

15. Pipe Colour Code:

Colour code to conform to IS: 2379:1990

S.No.	Pipe lines	Ground Colour	1st Colour Band	2nd Colour Band
1.	Filtered water (all cold water lines after filter)	Sea green	French blue	Signal red
2.	Drinking water (normal temperature)	Sea green	Light orange	
3.	Drinking water (chilled temperature)	Sea green	Light orange	Signal red

4.	Domestic hot water	Sea green	Light grey	
5.	Drainage	Black		
6.	LPG	Canary yellow		
7.	Fire Lines	Red		

TECHNICAL DATA SHEETS (TO BE SUBMITTED WITH BID):

Please furnish complete technical data & detail on the format as mentioned below:
Contractor furnishes the curves, dimension detail, installation detail and pump & motor detail catalogue while submitting the tender.

1.0 FILTER FEED PUMPS:

Location: Water Supply Plant Room

S. No.	Description:	
1.1	Pump:	
i)	Quantity	
ii)	Make	
iii)	Model	
iv)	No. of Stages	
v)	Power Requirement	
vi)	Efficiency	
vii)	Pump Type	
viii)	Capacity/ Discharge in l.p.s.	
ix)	Total Head	
x)	Suction end I.D.	
xi)	Delivery end I.D.	
1.2	Material:	
i)	Body	
ii)	Impeller	
iii)	Shaft	
1.3	Type of impeller	
1.4	Is it suitable for direct coupling.	
1.5	Motor:	
i)	Make	
ii)	Model	
iii)	R.PM	
iv)	Rating	
v)	Over Load Capacity	
vi)	Class of Insulation	
vii)	Details of Additional	
viii)	protection in winding	
ix)	Motor Efficiency	
x)	Is it suitable for direct coupling to	
xi)	Type of rotary movement	
xii)	Size and type of cable for	

2.0 VFD BASED HYDROPNEUMATIC PUMPS FOR DOMESTIC WATER SUPPLY (TO BE SUBMITTED WITH BID):

Location: Water Supply Plant Room

S.No.	Description:	
1.1	Pump:	
i)	Quantity	
ii)	Make	
iii)	Model	
iv)	Pump type	
v)	Model	
vi)	Head (Meters of WC)	
vii)	Efficiency (%)	
viii)	No. of Stages	
ix)	Suction End I.D.	
x)	Delivery End I.D.	
xi)	Details of N.P.S.H.	
xii)	Vibration Isolation Detail	
xiii)	Skid Details	
xiv)	Operating Weight	
xv)	Overall Dimension (mm)	
xvi)	Mechanical Seal Detail	
1.2	Material :	
i)	Body	
ii)	Impeller	
iii)	Type of Impeller	
iv)	Shaft	
	Is it suitable for direct coupling	
1.3	Motor:	
i)	Make	
ii)	Model	
iii)	Power Requirement (HP/KW)	

iv)	R.P.M.	
v)	Rating	
vi)	Over Load Capacity	
vii)	Class of Insulation	
viii)	Details of Additional protection In winding	
ix)	Motor Efficiency	
x)	Is it suitable for direct coupling to pump?	
xi)	Type of rotary movement	
xii)	Method of starting	
xiii)	Size and type of cable for connections	
1.4	Detail of VFD	
1.5	Pressure Vessel:	
i)	Make	
ii)	Model Number	
iii)	Material of construction (Vessel/Bladder)	

3.0 VFD BASED HYDROPNEUMATIC PUMPS FOR FLUSHING WATER SUPPLY (TO BE SUBMITTED WITH BID):

Location: STP Plant Room

S.No.	Description:	
1.1	Pump:	
i)	Quantity	
ii)	Make	
iii)	Model	
iv)	Pump type	
v)	Model	
vi)	Head (Meters of WC)	
vii)	Efficiency (%)	
viii)	No. of Stages	

ix)	Suction End I.D.	
x)	Delivery End I.D.	
xi)	Details of N.P.S.H.	
xii)	Vibration Isolation Detail	
xiii)	Skid Details	
xiv)	Operating Weight	
xv)	Overall Dimension (mm)	
xvi)	Mechanical Seal Detail	
1.2	Material :	
i)	Body	

ii)	Impeller	
iii)	Type of Impeller	
iv)	Shaft	
	Is it suitable for direct coupling	
1.3	Motor:	
i)	Make	
ii)	Model	
iii)	Power Requirement (HP/KW)	
iv)	R.P.M.	
v)	Rating	
vi)	Over Load Capacity	
vii)	Class of Insulation	
	Details of Additional protection	
viii)	In winding	
ix)	Motor Efficiency	
x)	Is it suitable for direct coupling to pump?	
xi)	Type of rotary movement	
xii)	Method of starting	
xiii)	Size and type of cable for connections	
1.4	Detail of VFD	
1.5	Pressure Vessel:	

i)	Make	
ii)	Model Number	
iii)	Material of construction (Vessel/Bladder)	

4.0 SUBMERSIBLE DRAINAGE SUMP PUMPS (TO BE SUBMITTED WITH BID):

S. No.	Description :	
	Quantity	
A)	Pump:	
1.1	Make	
1.2	Model	
1.3	Capacity/Discharge in l.p.s.	
1.4	Pumping Head	
1.5	Shut off Head	
1.6	No. of Stages	
1.7	Head/Stage	

S. No.	Description :	
1.8	Power Requirement	
1.9	Efficiency	
1.10	Mechanical Seal	
1.11	Material (body)	
1.12	Material (Impeller)/type of impeller	
1.13	Material (Shaft)	
1.14	Outer/Inner Casing	
1.15	Top Bracket	
1.16	Delivery end I.D.	
1.17	Max. solids handling capacity	
1.18	Minimum/maximum submergence for cut out/cut in	
1.19	Pump Type	
B)	Motor:	
1.1	Make	
1.2	Model	
1.3	R.P.M	
1.4	Power Supply	

1.5	Rated Power	
1.6	Rated Current	
1.7	Type of Enclosure	
1.8	Class of Insulation	
1.9	Details of Additional protection in winding	
1.10	Motor Efficiency	
1.11	Type of rotary movement	
1.12	Size and type of cable for connections	
1.13	At 100% Load	
	a) Current	
	b) Efficiency (%)	
	c) Power Factor (%)	
	d) Speed (RPM)	
1.14	Start Current	
1.15	Full Load Torque (kg.m)	

S. No.	Description :	
1.16	Number of Start per hour	
1.17	Design Standard	
1.18	Voltage Tolerance (%)	
1.19	Frequency tolerance (%)	

5.0 DOSING SYSTEM (TO BE SUBMITTED WITH BID):

Location: Water Supply Plant Room

S. No	Description	Chlorine Dosing	PH Dosing
a)	Chlorine Dosing Pump:		
	Quantity		
	Model		
	Pump Type		
	Make		
	Material of construction		

	Flow rate		
b)	Dosing Tank:		
	Quantity		
	Capacity		
	Material of Construction		

6.0 DYNASAND FILTER (TO BE SUBMITTED WITH BID):

S.No	Description	Dynasand Filter Sand
	Dynasand Filter Unit	
	Quantity	
	Type	
	Capacity	
	Filtration Rate	
	Material of Construction	
	Turbidity Removal Efficiency	

7.0 NANOBUBBLE GENERATOR UNIT (TO BE SUBMITTED WITH BID):

S. No.	Description	Nanobubble System
a)	Nanobubble Generator Unit	
	Quantity	1 No.
	Technology	
	Bubble Size	
	Gas Type	
	Make	
	Material of Construction	
	Flow Capacity	
	Operating Pressure	
	Power Requirement	
b)	Recirculation Pump	
	Quantity	1 No.
	Type	
	Make	
	Material of Construction	
	Flow Rate	
	Head	
c)	Gas Injection System	

	Quantity	1 Set
	Type	
	Material of Construction	
d)	Control Panel	
	Quantity	1 No.
	Type	
	Protection Class	
e)	Interconnecting Piping & Valves	
	Quantity	1 Lot
	Material of Construction	
f)	Nanobubble Contact Tank (If Required)	
	Quantity	1 No.
	Capacity	
	Material of Construction	

M.	General Conditions of Contract
----	--------------------------------

This will be as per the GCC Construction Works- 2023 of CPWD (as amended from time to time) to the extent applicable to the IIM Indore. Decision in this regard will be governed by the Engineer-in-Charge which shall be final and binding to the contractor.

Note: CPWD GCC may be downloaded from CPWD website i.e. [https:// cpwd.gov.in/](https://cpwd.gov.in/)

N.	Proforma of Schedules
----	-----------------------

SCHEDULE "A"

Schedule of quantities - as per Financial Bid.

SCHEDULE "B"

Schedule of materials to be issued to the contractor. - Deleted.

SCHEDULE "C"

Tools and plants to be hired to the contractor - Deleted.

SCHEDULE "D"

Extra schedule for specific requirements/document for the work, if any. - To be intimated later if required.

SCHEDULE "E"

Reference to General Conditions of contract laid down in the tender document.

Name of Work	"SITC of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore"
--------------	--

Estimated Cost Put to Tender (Excluding- Goods & Service Tax)	Rs. 2,89,29,950/- (Rupees Two Crore Eighty-Nine Lakh Twenty-Nine Thousand Nine Hundred Fifty Only)
EMD Amount	Rs. 5,78,599/- (Rs. Five Lakh Seventy-Eight Thousand Five Hundred Ninety-Nine Only) by e-payment through electronic mode (NEFT/ RTGS)
Performance Guarantee	5 (Five) % of tendered value
Security Deposit	5 % shall be deducted from RA/Final Bill.

SCHEDULE "F"

General Rules & Directions

- Officer inviting tender: The Chief Officer Engineering, IIM Indore on behalf of the Director, IIM Indore

Definitions:

2(v)	Engineer-in-Charge	Chief Officer Engineering, IIM Indore
2(viii)	Accepting Authority	Director, IIM Indore
2(x)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(xi)	Standard Schedule of Rates	CPWD DSR for Civil/Electrical items (Latest) and Market rates for Non-DSR Items.
2(xii)	Department	Estate Department, IIM Indore

Clause 1

- Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance: **7 Days**
- Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above: **07 days**

Clause 2

- i. Authority for fixing compensation under clause 2. : Director, IIM Indore
- ii. Compensation for delay of work : 2% (two Percent) per month of delay to be computed on per day basis

Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Tendered Value of work or of the Tendered Value of the item or group of items of work for which a separate period of completion is originally given.

Clause 2A

Whether Clause 2A shall be applicable: **No.**

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning date of start: **As per LOC.**

Total time allowed for completion of work: 120 (One Hundred Twenty) Days.

Authority to decide:

- (i) Extension of time : Director, IIM Indore
- (ii) Shifting of date of start in case of delay in handing over of site : Chief Officer Engineering, IIM Indore

Clause 6

Computerised Measurement Book (CMB) / Electronic Measurement Book (EMB)

(S) Mode of measurement: Computerised Measurement Book (CMB)

Clause 7

Minimum monthly gross work to be done together with net payment / adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment : 50 Lakhs (Excluding GST).

The Payment will be released preferably within 30 days from the date of submission of hardcopy of MB/Abstract along with all compliances document. However, Engineer-in-charge reserves the right to make the interim payment/Secure Advance for work done less than above bench mark, keeping in view requirements of the works

Clause 10 A

List of testing equipment to be provided by the contractor at site lab.- Deleted.

Clause 10 B - Applicable as per GCC modified to the extent as per provision under First regulation(First Regulations, available on <https://iimidr.ac.in>)

Clause 10 C - Deleted.

Clause 10 CC - Deleted

Clause 11

Specifications to be followed for execution of work:

Relevant BIS code, CPWD Specifications with up-to-date correction slips and OEMs specifications as applicable and or as per the direction of Engineer-in-Charge.

Clause 12

Deviation Limit shall be :50%

Clause 16

Competent Authority for Deciding reduced rates : Chief Officer Engineering, IIM Indore.

Clause 25

Resolution of Disputes and Disagreements

If any dispute or difference of any kind whatsoever arise between the parties in connection with or arising out of this Agreement or out of the breach termination or invalidity of this Agreement thereof, the parties shall resolve them by resorting to the following :

- The Party shall attempt within a period of 7 days after receipt of notice by the other party of the existence of a dispute, settle such dispute in the first instance by mutual discussions between the parties represented by the **Contractor** and Chief Officer Engineering of the institute.

- If the dispute cannot be settled by mutual discussion within 7 days the matter shall be referred to the Director IIM Indore, whose decision shall be full, final & binding on the parties.

Clause 32

Requirement of Technical Representative(s) and recovery Rate

Sl no	Minimum Qualification of Technical Representative	Discipline	Designation	Minimum Experience	Number of Engineers/ Representatives	Rate at which recovery shall be made from the contractor for each engineer, in the event of not fulfilling provision of clause 32	
						Figures	Words
1	Engineer	Electrical Engineering+ Mechanical Engineering/ Industrial Engineering	Project Manager cum planning/ quality/ site/ billing Engineer	Graduate Engineer with minimum 2 years' experience / Diploma holder with minimum 5 years' experience	1+1	Rs. 25,000/- per month	Rupees Twenty-Five Thousand only

- Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.
- Incase, the contractor does not deploy engineer (as per above stated qualification) at site or it is observed that the deployed engineer is not having knowledge of items to be executed then the contract may be terminated by engineer-in-charge after giving 07 days opportunity to contractor for compliance and decision of engineer-in-charge will be final & binding.
- In the event of cancellation, EMD/PG will also be forfeited besides taking any other action as per terms & conditions of contract.

O.	Special Conditions of Contract
-----------	---------------------------------------

1. The tenderer shall acquaint himself with the proposed site of work.
2. As built drawing duly including all dimension various installed parts will be submitted by contractor on completion of works.
3. If for any reasons, any part of the site is not available temporarily for some time for part of the work under the contract, the agreed construction schedule shall be suitably modified and contractor shall diligently divert his men and materials to utilize them appropriately, profitably and no claim of damages whatsoever shall be entertained on this account. However, the contractor shall be allowed extension of time for completing the work as deemed fit by the competent authority. The contractor shall also not be entitled to any compensation for any loss suffered by him and revision in the rates quoted by him.
 - (a) On account of delay in commencing the work by the contractor.
 - (b) On account of reduction in the scope of work.
 - (c) On account of suspension of work or abandoned after award of work.
4. The contractor shall make his own arrangement for obtaining electric connection required for execution of work and make necessary payments directly to the concerned departments and nothing extra shall be payable on this account. The contractor shall make his own arrangement for water suitable for construction.
5. On account of security consideration, some restrictions may be imposed by the security staff on the working and/ movement of men and materials etc. The contractor shall be bound to follow all such restrictions/ instructions and he shall organise his work accordingly. No claim on this account, whatsoever, shall be payable.
6. The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing barriers. He shall be responsible for all damages and accidents caused to existing/ new work due to negligence on his part. No hindrance shall be caused to traffic during the execution of the work.
7. The contractor shall be responsible for the watch and ward of all materials brought by the contractor to site against pilferage and breakage during the period of installation and thereafter till the works are physically handed over to the department.
8. The contractor shall take all preventive measures against any damage caused by rain, snowfall, floods or any other natural calamity, whatsoever during the execution of the work. The contractor shall be fully responsible for any damage to the Owners property and to the work for which the payment has been advanced to him under the contract. However, the contractor shall maintain an equal to the payment received against the work done, at his own cost. This will also cover the defect liability period. This shall be favouring the Director, Indian Institute of Management Indore. Nothing extra on this account shall be payable to the contractor for maintaining such insurance Policy.

9. The work will be carried out in the manner complying, in all respects, with the requirements of relevant bye-laws of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-Charge and nothing extra shall be paid on this account.
10. The contractor shall comply with proper and legal orders and directions of the local or public authority or municipality and abide by their rules and regulations and pay all fees and charges which may be liable.
11. The contractor shall give due notices to Municipal, Police and/or other authorities that may be required under the law/rules under force in the area and obtain all requisite licenses for temporary obstructions / enclosures and pay all charges which may be leviable on account of his execution of work under the agreement. Nothing extra shall be payable on this account.
12. All materials to be incorporated in the work shall be arranged by the contractor and shall be in accordance with the specifications laid down.
13. The tenderer shall use materials bearing ISI Certification Mark unless otherwise specified or allowed in writing by the Engineer-in-Charge. Any material banned by the department shall not be used in the work.
14. The contractor shall submit to the Engineer-in-charge samples of all materials for approval. Such samples of materials which affect aesthetics of the work shall also be got approved from the Engineer-in-charge of the project before procuring bulk supplies. These approved samples shall be preserved and retained in the custody of the Engineer-in-charge as standards of materials till the completion of the work. The cost of such samples shall be borne by the Contractor and nothing shall be payable on this account over the Agreement rates.
15. The contractor shall be required to get all the necessary mandatory and other tests as per the specifications/ IS codes, carried out on materials/ work from an approved laboratory as per the direction of the Engineer-in-charge. The testing charges and conveyance from the site shall be borne by the contractor.
16. In case any material / work is found sub-standard the same shall be rejected by the Engineer-in-charge/ Architect representative and the same shall be removed from the site of work within 48 hours, failing which the same shall be got removed by the Engineer-in-charge at the risk and cost of the contractor without giving any further notice and time.
17. In order to ensure quality of work during its execution, the Engineer-in-charge representative may require samples for mandatory or routine testing of materials. All costs of these samples, their packaging, conveyance from the site to the testing laboratory and return, shall be borne by the contractor.
18. Even ISI marked materials may be subjected to quality test at the discretion of the Engineer-in-charge/ Architect. Whenever ISI marked materials are brought to the site of work the contractor shall, if required by the Engineer-in-charge/ Architect, furnish manufacturer's test certificate or test certificate from approved testing laboratory to establish that the materials procured by the contractor, satisfy the provisions of relevant ISI codes. The testing charges shall be borne by the contractor. However cement/steel will be necessarily tested before start of work and also during the execution of work as per the requirements of specifications and will not be used till test certificates are obtained and approved by Engineer-in-Charge/ Architect.

19. The contractor shall supply free of charge the material required for testing. The cost of tests shall be borne by the contractor.
20. The work shall be executed and measured in metric system. The metric dimensions given in the schedule of quantities and drawing etc. shall be followed. (The dimension in FPS units wherever indicated are for guidance only) The figures in the drawings shall be followed.
21. The contractor shall be responsible for completing the work and for satisfying all terms and conditions of the Contract without any extra payment over his quoted rates unless otherwise specified. The contractor shall quote his rate for various items of work accordingly and no claim whatsoever shall be entertained for any incidental or extra work involved in the execution of the work as per nomenclature of the item and the specifications indicated in the tender documents.
22. Subject to the nomenclature of the item as per schedule of quantities, the specification indicated in the tender documents, the rates quoted shall include cost of all materials including royalty and taxes if any, labour, sundry inputs, execution of work at all heights, levels, pattern and design for all leads, lifts and depths including overhead charges and contractor's profit. Nothing extra shall be paid on this account.
23. The rates shall be inclusive of making any holes in walls/ RCC work for fixing any fixture/ frame work and making good the structure to its original shape and finish.
24. The contractor shall continue to maintain watch and ward to safeguard the Owner's property in his possession until the same is formally handed over as per directions of the Engineer-in-charge. Nothing extra over agreement rates shall be paid on this account.
25. The quantities of various items incorporated in the tender are approximate. However, the payments shall be made to the contractors on the basis of actual measurements taken at site.
26. The contractor shall protect the adjoining buildings or works and the work under execution from fire and shall make adequate arrangements for fire protection and firefighting and if any property is damaged, by fire due to the negligence of the contractor, the same shall be made good by the contractor at his own cost, to the entire satisfaction of Engineer-in-charge.
27. The contractor shall provide adequate lighting arrangements as approved by the Engineer-in-charge for carrying out the work during night time, if so required and also provide all other facilities for the labour employed to carry out the work as per direction of Engineer-in-Charge.
28. In order to achieve the targeted date of completion the contractor may have to work in multiple shifts, round the clock including public and gazetted holidays and nothing extra shall be paid on this account.
29. The contractor shall get the samples of all the materials to be used, in the work approved from Engineer-in-Charge before going for procurement. Procurement shall be taken up only after obtaining approval from the Engineer-in-charge. Any delay in getting the samples approved shall be contractor's responsibility.
30. All materials, articles and workmanship shall be of respective best quality and kind for the class described in the schedule of quantities and specifications. All materials, so used in different items of work shall be subject to the approval of the Engineer-in-charge and Architect.

31. The contractor shall be responsible for all statutory provisions and deductions towards ESI, PF or any other, as the case may be or any other levies and taxes shall be borne by the contractors. The TDS and Contract Tax or any other statutory levels/taxes incorporated from time to time shall be deducted progressively from the running account bills, as applicable at the time of payment. No claim in this regard shall be entertained.
32. The contractor is supposed to abide the minimum wages act, and shall produce all records to the Engineer-in-charge or any other statutory authority as and when called for. The Engineer-in-charge does not hold any responsibility on account of any lapses in this regard.
33. All spaces allotted to the contractor as described above shall be vacated and all structures removed from site at any time as and when required and directed by the Engineer-in-charge, unconditionally and without any reservation. The Engineer-in-charge will not be obliged to give any reason for such removal. Upon receiving instructions to vacate the space, the contractor shall immediately remove all his structures, materials, etc. from the sources and clear and clean-up the site to the satisfaction of the Engineer-in-charge.
34. It shall be the responsibility of the Contractor to safeguard the site and ensure that no illegal encroachments are made by outside elements within the area allotted to the contractor. Upon completion of the work or earlier as required by Engineer-in-Charge, the contractor shall vacate the land totally without any reservation.
35. The contractor will arrange to erect, at his own cost, barbed wire or other appropriate fence around the infrastructure site, with entry/exit gates at suitable points. The contractor shall, at his own cost, provide and erect suitable fencing around the spaces allotted to him at the infrastructure sites to ensure the security of his men. Materials and equipment within the sites and in relation to other contractors who will also be allotted spaces at above sites.
36. The security of workmen, materials, equipment stores etc. within the area allotted to the contractor shall be the responsibility of the contractor.
37. The site of work shall have required equipment's for various tests at site by the contractor at his own cost and nothing extra shall be payable on this account.
38. The quantities indicated are for guidance only however it may vary to any extent and the contractor should not have any financial or other implications for such variations. The owner reserves to reduce the scope of work of any item if the contractor fails to deliver the works in time and the contractor shall not ask for any financial consideration for such deletion of scope of the work.
39. The contractor shall take photographs of site prior to commencement of work, during construction and after completion of work as suggested and shall submit the photographs in soft and hard copies to IIM for which no extra payment will be made.
40. If required and directed by Engineer-In-Charge, contractor shall arrange visits of his personnel comprising of Engineer-In-Charge to various places/ plants in or out side Indore to check and verify the quality of material at manufacturer's places. No extra cost shall be given for this to contractor.
41. Proforma of Registers to be as per standard CPWD formats.

42. Any debris/ dismantled unserviceable material generated at site should be disposed by the contractor in the area marked by Indore Municipal Corporation No payment shall be made towards the transportation & statutory fees, if any of IMC.

43. Stamp Duty:

- a. Stamp (wherever mentioned in the tender/ not mentioned but required legally), stamp duty will generally be following the Indian Stamp Act, 1899 (as applicable to Madhya Pradesh).
- b. For the contract, the stamp duty shall be as per the Indian Stamp Act, 1899 (as applicable to Madhya Pradesh). Any revision, if made by the govt. will be applicable at the time of execution of the agreements.
- c. The cost w.r.t. stamp duty will solely be with the bidder i.e. cost to be borne by successful bidder.

44. Electricity and water charges:-

- a. The electricity charges shall be recovered @ Rs.1000/- on monthly basis.
- b. The water charges shall be recovered @ Rs.500/- on monthly basis.

Letter of Transmittal

To,
The Chief Officer Engineering,
IIM Indore (M.P.)

Sub: Submission of bid for the work of "Supply, Installation, Testing & Commissioning (SITC) of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore"
Vide NIT No. IIMI/Estate/14/2026/277 File No. 601

Sir,

Having examined the details given in Notice and bid document for the above work, I/we hereby submit relevant document.

1. I/we hereby certify that all the statement made and information supplied in respect of the aforesaid bid and accompanying statements are true and correct.
2. I/we furnished all information and details necessary for eligibility and have no further pertinent information to supply.
3. I/we submit the requisite bid security declaration/ requisite certified solvency certificate and authorize the Institute i.e. IIM Indore or its officials to approach the bank issuing the same to confirm the correctness thereof. I/We also authorize IIM Indore and its officials to approach individuals, employees firms and corporation to verify our competence and general reputation.
4. I/We submit the certificates/ documents in support of our suitability, technical knowledge and capability for having successfully completed the said works (as mentioned / as attached in support of eligibility requirement)

Seal of bidder

Date of submission:

Signature(s) of Bidder(s)

Format of Bank Guarantee

Bank Guarantee for Performance Security

(On letter head of the Owner with adhesive stamp / non-judicial stamp paper of appropriate value at the time of issue of Bank Guarantee)

THIS DEED OF GUARANTEE made on _____ day of _____ 2026, between [Name of Bank], having Registered Office at [Address], (hereinafter called the "Bank" which expression shall unless repugnant to the context and meaning thereof include its successors) in favor of **Indian Institute of Management Indore having its office at Prabandh Shikhar, Rau-Pithampur Road, Indore- 453556 (M.P.)** (hereinafter called "Owner" which expression shall unless repugnant to the context and meaning thereof include its successors and assigns).

WHEREAS (IIMI) Indian Institute of Management Indore has issued a Letter of Acceptance / Letter of Intent No..... dated _____ to _____ having its Corporate office at _____ (hereinafter called the "Contractor") which constitute a binding Contract (hereinafter called "Contract Agreement") for carrying out the **"Supply, Installation, Testing & Commissioning (SITC) of Water Treatment Units of 350 KLD & 150 KLD Capacity based on Dynasand + Ultrafiltration (UF) + Nanobubble + Reverse Osmosis (RO) Technology for Drinking Water Treatment at IIM Indore"** based upon the Tender submitted by the Contractor and agreed between Client and Contractor and subject to the terms therein contained. The work to be carried out by Contractor shall be supervised and implemented by M/s _____ (hereinafter called "Contractor/Bidder")

AND WHEREAS in accordance with the terms and conditions of the contract agreement, the Contractor has agreed to furnish a Bank Guarantee to Owner in the form of acceptable to performance guarantee for a sum of Rs. _____ (Rupees _____ Only) to ensure timely and satisfactory performance by the Contractor of its obligation under the Contract Agreement.

AND WHEREAS the Bank has at the request of the Contractor agreed to furnish this irrevocable and unconditional guarantee in favour of Owner to secure performance by the Contractor of its obligations under the Contract Agreement on the terms and conditions herein contained.

NOW THIS DEED WITNESSTH AS FOLLOWS:

1. The Bank hereby unconditionally and irrevocably guarantees the due and punctual performance and observance of and compliance by the Contractor of the covenants, agreements, conditions and provisions expressed or implied on the part of the Contractor to be performed observed or complied with under the Contract Agreement in accordance with the terms thereof and in the event of any non-performance and non-compliance of the same for any reason, the Bank shall absolutely irrevocably and unconditionally without any demur right of set off or counter claim, forthwith upon written demand by Owner and without demur or protest and without reference to the Contractor pay to Owner a sum not exceeding Rs. _____ (Rupees _____ only). A demand so made by _____ shall be final and binding on the Bank.

2. The Bank's liability under this Guarantee is restricted to Rs. _____ (Rupees _____ only).
3. The decision of Owner for the time being in force, or at any time thereafter as to the non-performance, non-observance and non-compliance by the Contractor of the covenants, agreements, conditions and provisions, expressed or implied, on the part of the Contractor, to be observed performed or complied with under the Contract Agreement shall be final, conclusive and binding upon the Bank and shall not in any circumstances be questioned by the Bank, under what so ever circumstances.
4. Any demand for payment under this Guarantee shall be made on the Bank by Owner in writing at [Bank Address] and shall be deemed to have been sufficiently made by Owner if the writing containing the demand is sent to the Bank by registered post to the address as aforesaid or sent to the Bank by hand delivery at such address and written acknowledgement obtained to such delivery.
5. The guarantee obligations of the Bank hereunder shall continue in force and effect and be binding on the Bank in accordance with its terms upto _____ or unless extended on written demand by IIM Indore until the due performance, observance and compliance by the Contractor of all the covenants, agreements, conditions and provisions, expressed or implied, on the part of the Contractor to be observed, performed or complied with under the Contract Agreement, the completion of the Defects Liability Period and issue of the Certificate of Final Completion by Owner in accordance with the Contract Agreement.
6. As between the Bank and Owner (but without affecting the Contractors' obligations) the Bank shall be liable under this Guarantee as if it were the sole principal debtor. The Bank's liability hereunder shall not be discharged nor shall its liability be affected by:
 - a. Any time, indulgence, waiver or consent at any time given by Owner to the Contractor.
 - b. Any amendment to the Contract Agreement,
 - c. The making or the absence of any demand by Owner on the Contractor or any other person for payment.
 - d. The enforcement or absence of enforcement of the Contract Agreement or of any security or other defect in any provision of the Contract Agreement or of any of the Contractors obligations there under;
 - e. The dissolution, amalgamation, reconstruction or reorganization or appointment of any Administrative Receiver of the Contractor.
7. The Guarantee herein contained shall not be determined or in any way prejudiced or affected by any change in the constitution of the Bank/ Owner or by any merger, or amalgamation or reconstruction of the Bank / Owner but shall be enforceable against the merged, amalgamated or reconstruction body.
8. The Bank hereby expressly and irrevocably waives all claims of waiver, release, surrender or compromise and all defenses, set offs, counter claims recoupments, reductions, limitations and impairments, whatsoever.

9. Owner shall be at liberty to vary and alter or modify any of the terms and conditions of the Contract Agreement including without limitation to extend from time to time the time for the performance of the Contract Agreement by the Contractor or to postpone from time to time any of the powers exercisable by owner against the Contractor, to forbear or to enforce any of the terms and conditions of the Contract Agreement, without in any manner affecting this Guarantee and without notice to or assent of the Bank.
10. The Bank waives any right to require/ proceeding first against the Contractor or the realization first of any other security or other guarantee, if any.
11. The Bank agrees and confirms that its obligation to make payment to Owner on demand hereunder and discharge of such obligation shall not be delayed, exercised or avoided by reason of any act or omission on the part of Owner.
12. The bank declares and confirms that the Bank has taken all necessary corporate action to authorize the execution delivery and performance of this Guarantee in accordance with the terms hereof and that the Bank has full power to enter into and perform and discharge its obligations under taken hereunder and that this Guarantee constitutes legal, valid and binding obligation of the Bank, enforceable in accordance with its terms and any defects therein or in its execution shall not be a plea for non-payment or performance of its obligation.
13. This guarantee shall be Governed by and construed in all respects according to the laws of India and shall be subject to the jurisdiction of the courts in Indore.
14. Any forbearance or indulgence on the part of Owner in the enforcement of the covenants, agreements, conditions and provisions, expressed or implied, on the part of the Contractor to be observed, performed or complied with by the Contractor under the contract agreement shall in no way relieve the Bank of its liability under the Guarantee.
15. Terms and expression defined in the contract agreement and used herein shall have the meanings assigned to them therein save and except where the context otherwise require.
16. Notwithstanding anything contained hereinabove;
 - a. Our liability under this bank guarantee shall not exceed Rs. _____ (Rupee _____)
 - b. This bank guarantee shall be valid upto _____ or and
 - c. It is a condition to our liability for payment of the guaranteed amount or part any thereof arising under this Bank guarantee that we receive a valid written claim or demand for payment under this bank guarantee on or before _____ or as provided in clause 5 failing which our liability under this bank guarantee will automatically cease.
 - d. This bank guarantee is not assignable and not transferable to third party.

IN WITNESS WHEREOF THE BANK HAS SET ITS HAND AND SEAL THE DAY AND YEAR FIRST ABOVE WRITTEN.

SIGNED for and behalf)
Of the Bank by it's duly authorized)
Representative)
In the presence of)

Annexure-3

Local Content certification

We M/s _____(bidder's name) under that we meet the mandatory Local Content (LC) requirement for qualifying as 'Class I Local supplier's' as per the PP-LC Policy against Tender No. _____dated _____. The percentage of Local Content in the Bid is _____%.

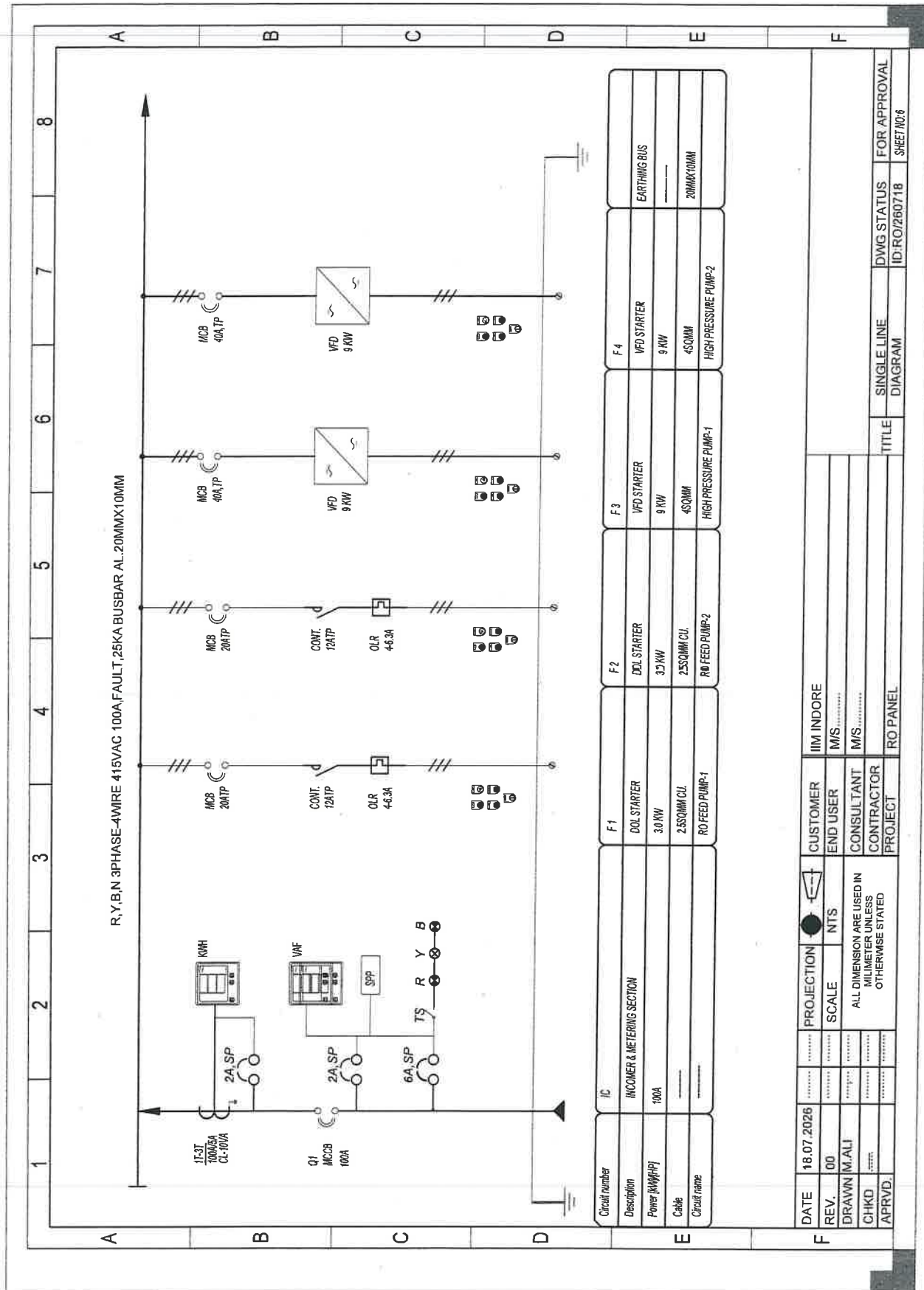
Authorized dated signature of the bidder with stamp.

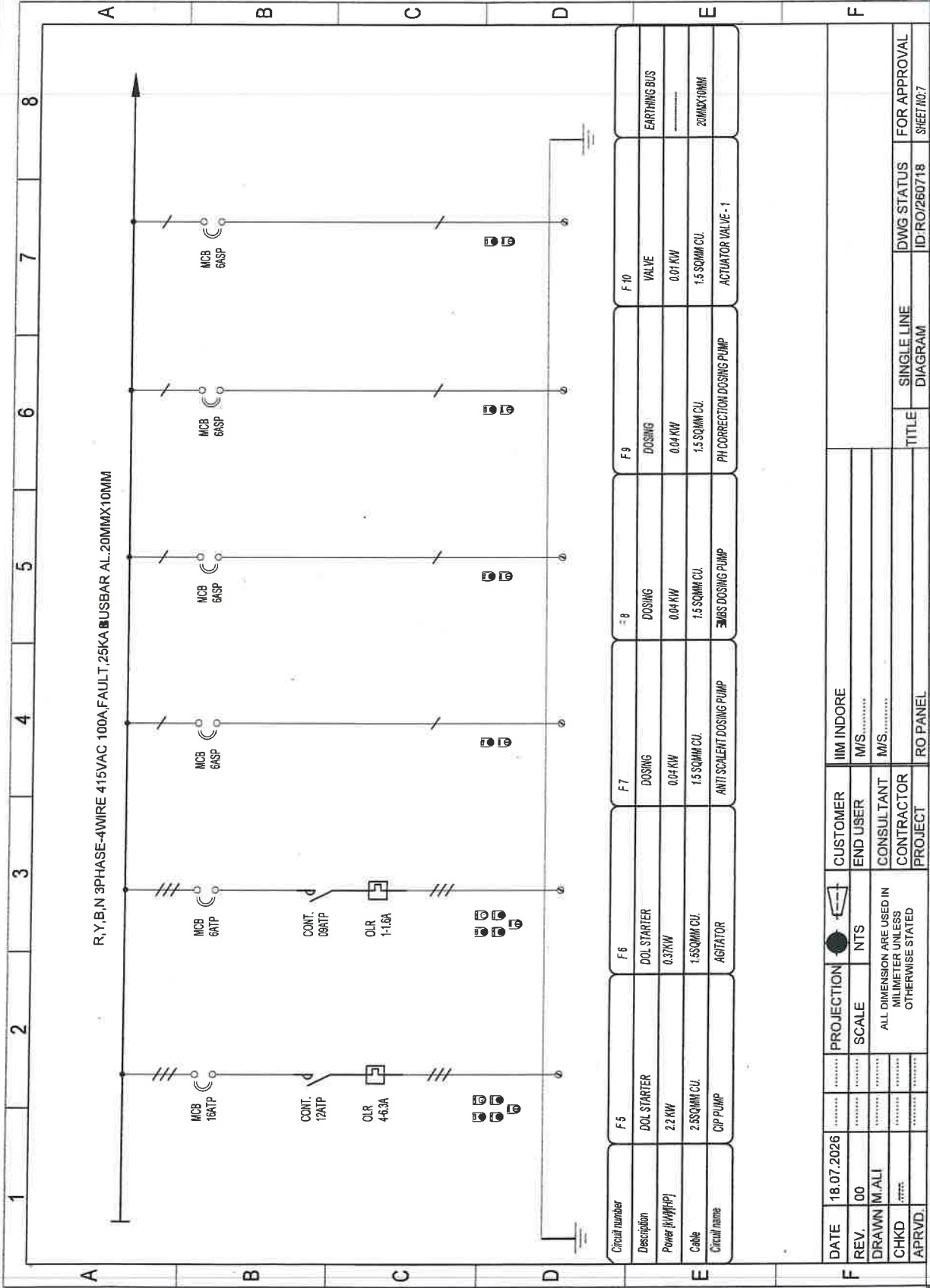
Q.

FINANCIAL BID

1. The Financial Bid is to be filled through e-procurement portal namely CPPP through <https://eprocure.gov.in/eprocure/app>
2. Any other mode of bid submission will not be accepted.


Tender Inviting Authority





DATE	18.07.2026	PROJECTION		CUSTOMER	IIM INDORE
REV.	00	SCALE	NTS	END USER	M/S.
DRAWN	M.ALI	ALL DIMENSION ARE USED IN MILLIMETER UNLESS OTHERWISE STATED			
CHKD					
APRVD.					
		PROJECT		RO PANEL	
		CONTRACTOR		TITLE	
		SINGLE LINE DIAGRAM		DWG STATUS	
				ID:RO/260718	
				FOR APPROVAL	
				SHEET NO:7	

