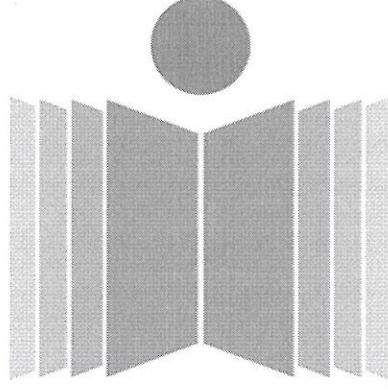


NIT No.: IITH/CMD/ELE/NIT/2022-23/05



भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

NOTICE INVITING TENDER (NIT)

Name of the work: "5 Years of Operation and Maintenance of 650 KLD capacity Sewage Treatment Plant-1(STP-1) at IITH campus".


Executive Engineer -Electrical
IIT Hyderabad

1

MAHANKAL
I SATEESH

Digitally signed by
MAHANKALI SATEESH
Date: 2022.10.10
19:24:08 IST

INDEX

Sl. No.	Description	Page No
1	Notice Inviting Tender (NIT)	01
2	Instructions for online submission	02
3	Guidelines for Registration	02
4	Preparation of Bids	03
5	Submission of Bids	03
6	Eligibility Criteria	05
7	Form – J (Affidavit)	10
8	Checklist of Documents to be submitted	11
9	Undertaking pursuant to Section 206AB of Income Tax Dept.	12
10	Proforma of Schedules A to F	13
11	Schedule F	14
12	Special Conditions of Contract	18
13	Notes on Price bid	36
13	Appendices I to III	37

INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD

NOTICE INVITING TENDER

NIT Reference No. IITH/CMD/ELE/NIT/2022-23/05

Indian Institute of Technology Hyderabad invites on behalf of President of India online Item rate bids (e-tender) in Two Bid (Technical cum Eligibility + Financial) System, from the Original Equipment Manufacturer (OEM)/ OEM authorized Specialized Agencies for the below mentioned work.

Copy of valid Registration of Firm (ROF) certificate, PAN card, GST Registration certificate & GSTIN should accompany the Technical Bid and those certificates should be valid on the last date of submission of bid.

1.1	NIT No.:	IITH/CMD/ELE/NIT/2022-23/05	
1.2	Name of Work:	"5 Years of Operation and Maintenance of 650 KLD capacity Sewage Treatment Plant(STP) at IITH campus."	
1.3	Location of work	Indian Institute of Technology(IIT) Hyderabad campus, Kandi-502284, Sangareddy, Telangana, India	
1.4	Estimated Cost: (given merely as a rough guide)	Rs. 5,10,04,447/-	
1.5	Earnest Money Deposit (EMD):	Rs. 10,20,100/-	
1.6	Period of Completion:	5 years	
1.7	Date of Online Publication/Download of Tender	10/10/2022 @1700hrs	
1.8	Last Date & time for receiving of Pre-Bid Queries and to mail ID	Date & Time	17/10/2022 @1600 hrs
		To Mail ID:	ee.electrical@iith.ac.in
1.9	Date and Time of Pre-bid meeting at Conference hall, CMD, IIT Hyderabad	18/10/2022 @ 1100 hrs	
1.10	Last Date for Submission of Bids	03/11/2022 1500hrs	
1.11	Date and time of Opening of Technical Bids	04/11/2022 1530hrs	
1.12	Date and time of Opening of Financial Bids	To be decided	
1.13	Cost of Bid Document:	NIL	

The Tender Document can be downloaded from <https://mhrd.euniwizarde.com> OR Institute website-
<https://www.iith.ac.in/tenders/#Civil%20Works>.

The bid is to be submitted online mode only through the E-procurement portal of <https://mhrd.euniwizarde.com> up to the last date and time of submission of tender. Manual bids shall not be accepted.

The bids (both Technical and Financial) shall be submitted online through E-procurement portal of <https://mhrd.euniwizarde.com>.

Any queries relating to the process of online bid submission or queries relating to e-tender Portal in general may be directed to the Helpdesk Support - Phone No. 011-49606060. Mail id: - helpdeskeuniwizarde@gmail.com.

INSTRUCTIONS FOR ONLINE BID SUBMISSION:

The Tender Document can be downloaded from <https://mhrd.euniwizarde.com> OR Institute website-
<https://iith.ac.in/tenders>.

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

More information useful for submitting online bids may be obtained at: <https://mhrd.euniwizarde.com>

GUIDELINES FOR REGISTRATION:

1. Bidders are required to enrol on the e-Procurement Portal with clicking on the link "Bidder Enrolment" on the e-tender Portal by paying the Registration fee as applicable + Applicable GST.
2. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the e-Wizard Portal.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Only Class III Certificates with signing + encryption key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.) with their profile or bidders can contact help desk for getting the DSC.
5. Only valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6. Bidder then logs in to the site through the secured log-in by entering their user ID/password and the password of the DSC / e-Token.
7. The scanned copies of all original documents should be uploaded in **pdf format** on portal <https://mhrd.euniwizarde.com>
8. After completion of registration payment, bidders need to send their acknowledgement copy on help desk mail id helpdeskeuniwizarde@gmail.com for activation of their account.

SEARCHING FOR TENDER DOCUMENTS:

1. There are various search options built in the e-tender Portal, to facilitate bidders to search active tenders by several parameters like Department name, Tender category, estimated value, Date, other keywords, etc. to search for a tender published on the Online Portal
2. Once the bidders have selected the tenders they are interested in, you can pay the form fee and processing fee (NOT REFUNDABLE) by net-banking / Debit / Credit card then you may download the required documents / tender schedules, Bid documents etc. Once you pay both fee tenders will be moved to the respective 'requested' Tab. This would enable the e- tender Portal to intimate the bidders through e-mail in case there is any corrigendum issued to the tender document.
3. The bidder should make a note of the unique Tender No assigned to each tender, in case they want to obtain any clarification/help from the Helpdesk.

PREPARATION OF BIDS:

1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid.
3. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in **PDF/XLSX/PNG etc., formats**. Bid Original documents may be scanned with 100 dpi with Colour option which helps in reducing size of the scanned document.
4. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GST, Annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Documents" available to them to upload such documents.
5. These documents may be directly submitted from the "My Documents" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.
6. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that needs to be submitted. Any deviations from these may lead to rejection of the bid.

SUBMISSION OF BIDS:

1. Bidder should log into the website well in advance for the submission of the bid so that it gets uploaded well in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document as a token of acceptance of the terms and conditions laid down by IIT Hyderabad.
3. Bidder has to select the payment option as "**e-payment**" to pay the **tender fee / EMD** as applicable and enter details of the instrument.
4. *In case of Bank Guarantee (BG) bidder should prepare the BG as per the instructions specified in the tender document. The BG in original should be posted/couriered/given in person to the concerned official of IIT Hyderabad before the Online Opening of Technical Bid. In case of non-receipt of BG in*

original by the said time, the uploaded bid will be summarily rejected.

5. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white Colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.

6. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

7. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data, which cannot be viewed by unauthorized persons until the time of bid opening.

8. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

9. Upon the successful and timely submission of bid click "Complete" (i.e. after Clicking "Submit" in the portal <https://mhrd.euniwizarde.com>), the portal will give a successful Tender submission acknowledgement & a bid summary will be displayed with the unique id and date & time of submission of the bid with all other relevant details.

10. The tender summary has to be printed and kept as an acknowledgement of the submission of the tender. This acknowledgement may be used as an entry pass for any bid opening meetings.

11. The off-line tender shall not be accepted and no request in this regard will be entertained whatsoever.

12. As per portal norms Tender Processing Fee will be applicable.

AMENDMENTS OF BID DOCUMENT:

At any time prior to the deadline for submission of Bids, the department reserve the right to add/modify/delete any portion of this document by the issuance of a Corrigendum, which would be published on the website and will also be made available to the all the Bidder who has been issued the tender document. The Corrigendum shall be binding on all bidders and will form part of the bid documents.

ASSISTANCE TO BIDDERS:

For any clarification in using <https://mhrd.euniwizarde.com>

1. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

2. Any queries relating to the process of online bid submission or queries relating to e-Wizard Portal in general may be directed to the 24X7 e-Wizard Helpdesk Support. Please feel free to contact euniwizarde helpdesk (as given below) for any query related to e- tendering - Phone No. 011-49606060.

Mail id: - helpdeskeuniwizarde@gmail.com

The contact number for the helpdesk is 8448288994/86/87/89/88/81/90/92/82

011-49606060, 07903269552, 9355030608, 9055030613, 7903810198, 9355030606, 9315620706,
9355030623, 9355030628, 8800526452, 9205898228, 9122643040, 9355030604
eprochelpdesk.01@gmail.com, eprochelpdesk.44@gmail.com, eprochelpdesk.06@gmail.com

3. The tender inviting authority has the right to cancel this e-tender or extend the due date of receipt of the bid(s).

4. The bid should be submitted through e-Wizard portal (<https://mhrd.euniwizarde.com/>) only.

NOTICE INVITING TENDER

NIT Reference No. IITH/CMD/ELE/NIT/2022-23/05

1. BASIC ELIGIBILITY CRITERIA

Bidders shall produce definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:

Experience of having successfully completed similar works during the last 7 years ending last day of the month previous to the one in which tenders are invited

Three similar completed works each costing not less than Rs. 2,04,01,779/-only or

Two similar completed works each costing not less than Rs. 3,06,02,668/-only or

One similar completed work costing not less than Rs. 4,08,03,558/-only

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of tender.

“Similar Work” shall mean the work of SITC (Supply, Installation, Testing and commissioning) or 24/7/365days O & M (Annual Operation & Maintenance Contract) of Sewage treatment plant with MBR Technology for a minimum period of 2 years and capacity not less than 450/600 KLD.

(For private works TDS certificate or Form-26 AS in support of value of work done.)

2. Turnover: Average annual financial turnover on similar works should be at least 50% of the estimated cost put to tender during the immediate last three consecutive financial years ending 31st March 2022. The value of annual turnover figures shall be brought to current value by enhancing the actual turnover figures at simple rate of 7% per annum. The certificate from the Chartered Accountant shall be enclosed with the bid.

3. Profit/loss : The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last five consecutive balance sheet (balance sheet in case of private/public limited company means its standalone financial statement and consolidated financial statement both), duly audited and certified by the Chartered Accountant.

4. Banker's Certificate from a Commercial Bank or Net worth Certificate:

Banker's Certificate of the amount equal to 40% of the Estimated Cost put to tender (ECPT),
or

Net worth certificate of minimum 10% of the estimated cost put to tender issued by certified Chartered Accountant with UDIN as per format enclosed as Annexure-I

5. To become eligible, the tenderer shall have to furnish an affidavit as per Form 'J' of the NIT.

6. The bidder shall have Employees Provident Fund (EPF) enlistment and proof of the same shall be attached along with the Technical Bid clearly showing the Provident Fund Code number.

7. The bidder shall have the Employee State Insurance Corporation (ESIC) enlistment and proof of the same shall be attached with the Technical bid.
8. The bidder shall submit the Indemnity bond as per format provided in Annexure-II.
9. The bidder shall submit the authorization certificate from the Technology Provider of existing STP-01 plant as per format enclosed as Annexure-III
10. Agreement shall be drawn with the successful tenderer on prescribed Form which is available in the website: https://drive.google.com/file/d/1C7JCvsCtaK6sIZYnRIAPxe_2Eu8WZixB/view **(with up to date correction slips if any)** Tenderer shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
11. The time allowed for carrying out the work will be as stated at para 1 from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the tender documents.
12. The site for the work is available.
13. Tender documents consisting of plans, specifications, the schedule of quantities of the various classes of work to be done and the set of terms & conditions of contract to be complied with by the contractor whose tender may be accepted and other necessary documents can be seen for information at the above mentioned website.
14. Applicants are advised to keep visiting the above mentioned website from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respects including updates thereof, if any. An incomplete application may be liable for rejection.
15. The contractor whose tender is accepted, will be required to furnish performance guarantee of 3% (Three Percent) of the tendered amount within the period specified in Schedule F. This guarantee shall be in the form of Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any scheduled bank or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F'. including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.
16. The description of the work is as follows:

"5 Years of Operation and Maintenance of 650 KLD capacity Sewage Treatment Plant-1(STP-1) at IITH campus".

Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil (so far

97

**MAHANKALI
I SATEESH**

Digitally signed by
MAHANKALI SATEESH
Date: 2022.10.10
19:24:08 IST

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

17. Tenders with any condition including that of conditional rebates shall be rejected forthwith.
18. Cost of **Bid document cost** and **EMD** may also be remitted to Institute's account number as per bank particulars given below:

Name of the Account Holder	:	Indian Institute of Technology Hyderabad
Account Number	:	30412797764 (Current Account)
Name of the Bank	:	State Bank of India
Address of the Bank	:	IIT Kandi, IIT Hyderabad Campus, Kandi, Sangareddy, Telangana - 502285
Branch code	:	14182
IFSC code	:	SBIN0014182
MICR code	:	502002528
SHIFT code	:	SBININBB762

19. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.
20. Canvassing whether directly or indirectly, in connection with tenderers is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
21. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.
22. The contractor shall not be permitted to tender for works if his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Institute.
23. No Engineer of gazette rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the

previous permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractor's service.

24. The tender for the works shall remain open for acceptance for a period of 90 days from the date of opening of tenders/ ninety days from the date of opening of financial bid in case tenders are invited on 2/3 envelop system (strike out as the case may be) if any tenderer withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the tenderer shall not be allowed to participate in the retendering process of the work.

25. (A) All taxes, Labour Cess etc., as applicable shall be borne by the contractor himself. The contractor shall quote his rates considering all such taxes including GST on works. Any recovery towards GST is notified by the competent authority, the same shall be effected and no claim what so ever shall be entertained by IITH. The contractor shall quote his rates accordingly.

(B) 2% as TDS amount of GST amount payable on the bills will be deducted as per the Govt. of India, Ministry of Finance, Department of Revenue notification vide No.65/39/2018-DOR, dtd: 14-09-2018.

26. *GST registration certificate of the state in which the work is to be taken up, if already obtained by the bidder.*

If the bidder has not obtained GST registration in the state in which the work is to be taken up or as required by GST authorities, then in such a case the bidder shall scan and upload following under taking along with other bid documents.

"If the work awarded to me, I/We shall obtain GST registration certificate of the state, in which work is to be taken up, within one month from the date of receipt of award letter or before release of any payment by IIT Hyderabad, whichever earlier, failing which I/We shall responsible for any delay in payments which will be due towards me/us on a/c of the work executed and/or for any action taken by IIT Hyderabad or GST department in this regard."

27. *Bidder has to submit Undertaking on their letter head pursuant to the Section 206AB (as applicable) of the Income Tax Act,1961 in prescribed format as enclosed at Annexure-A along with each and every bill submitted for payment.*

28. *Pre-bid conference shall be held with the eligible and intending bidders in the office of Superintending Engineer, Construction & Maintenance Division, IIT Hyderabad, Kandi, Sangareddy- 502 284, Telangana State at 1100 Hrs. on 18-10-2022 to clear the doubts of intending bidders, if any. Bidders should send by email all their queries, one day prior to the date of pre-bid conference i.e. on or before 17-10-2022 1600 Hrs,*

Email id- ee.electrical@iith.ac.in

29. After pre-bid conference, modifications if required in the bidding documents and clarifications to the queries raised by intending bidders will be posted on the website and E-tendering portal. If

further pre-bid conferences are required for complete and effective interactions, the date and time of same will be communicated at the end of 1st pre-bid meeting or later. All modifications/addendums/corrigendum issued regarding this bidding process, shall be posted on website and E-Tendering portal only and shall not be published in any Newspaper.

30. This notice inviting Tender shall form a part of the contract document. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of: -

- a) The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
- b) Standard Contract form (General Conditions of Contract) as posted in the website of the Institute. The bidder is deemed to have gone through and understood the Standard Contract Form and the General Conditions of Contract.


Executive Engineer-Electrical
IIT Hyderabad

(Signature of bidder)

FORM 'J'

AFFIDAVIT

I/we undertake and confirm that our firm/partnership firm has not been blacklisted by any state/Central Departments/PSUs/Autonomous bodies during the last 7 years of its operations. Further that, if such information comes to the notice of the department then I/we shall be debarred for bidding in IIT Hyderabad in future forever. Also, if such information comes to the notice of IIT Hyderabad on any day before date of start of work, the Engineer-in-charge shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee (Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)

NOTE: Affidavit to be furnished on a 'Non-Judicial' stamp paper worth Rs.100/-

Signature of Bidder(s) or an authorized Officer of the firm with stamp

Checklist of documents to be submitted along with Technical Bid

Sl. No.	Doc Ref	Description of the Document	Enclosed Yes/No	Remarks
	<i>Applicant shall submit the following documents for Technical scrutiny</i>			
1	Registration of Firm (ROF)	Copy of valid Registration of Firm (ROF)		
2	PAN details	Copy of PAN card		
3	GST registration details	Copy of GST Registration certificate & GSTIN should accompany the Technical Bid		
4	Details of similar works executed <i>(Detailed statements to be enclosed)</i>	Not less than 40% of estimated cost i.e., Rs. 2,04,01,779.00 (Three similar works)		
		Not less than 60% of estimated cost i.e., 3,06,02,668.00 (Two similar works)		
		Not less than 80% of estimated cost i.e., Rs. 4,08,03,558.00 (One Similar work)		
5	As per Para No. 1.5 of NIT	Cost of EMD		
6	As per Sl. No.2 of NIT	Copy of Certificate from CA for Average Annual Financial Turnover for last 03 years		
7	As per Sl.No.3 of NIT	Profit and loss account statement for Last 05 financial years		
8	As per Sl.No.4 of NIT	Banker's certificate or Net worth certificate as per Annexure-I		
9	As per Sl.No.6 of NIT	EPF Enlistment proof		
10	As per Sl.No.7 of NIT	ESIC enlistment proof		
11	As per Sl. No. 8 of NIT	Indemnity bond as per Annex-II		
12	As per Sl.No.9 of NIT	Technology Provider Authorization certificate as per Annexure-III		
13	As per Sl.No.26 of NIT	Undertaking for GST registration in the state in which the work is to be taken up		
14	As per Sl.No.27 of NIT	Undertaking pursuant to Section 206AB (as applicable) of the Income Tax Act, 1961 (Proforma enclosed as Annexure-A)		

On Contractor/ Agency's Letter Head

Undertaking pursuant to Section 206AB (as applicable) of the Income Tax Act, 1961

To,
The Registrar
IIT Hyderabad
Kandi, Sangareddy- 502284.

Dear Sir/Madam,

Subject: Declaration confirming filing of Income Tax Return for immediate two preceding years.

I, Ms./Mrs./Mr. _____ in capacity of Authorized Signatory of _____ having PAN _____ and registered office at _____ do hereby declare that _____ has filed Income Tax Returns for immediately last 2 preceding Financial Years as mentioned below per due dates under Section 139 (1) of the Income Tax Act, 1961 ('the Act') and details of which are as given under:

Financial Year for which Income Tax Return was due as per Section 139(1)	Acknowledgement no. of ITR filed under Section 139(1)	Date of Filing
2020-21 (if applicable on date of this declaration)		
2019-20		
2018-19		

Further, I confirm that _____ has linked the above PAN with Aadhaar number as on this date.

I also undertake that _____ hereby indemnify **Indian Institute of Technology Hyderabad** for any loss/liability (including any Tax, interest, penalty, etc.) that may arise due to incorrect reporting of above information.

For _____

Signature: _____

Name of person:

Designation:

Place:

Date:

PROFORMA OF SCHEDULES

SCHEDULE 'A'

Schedule of quantities (Enclosed): **Volume 2**

SCHEDULE 'B'

Schedule of materials to be issued to the contractor

Sl. No.	Description of item	Quantity	Rates in figure & words at which the material will be charged to the Contractor	Place of issue
..... NIL				

SCHEDULE 'C'

Tools and plants to be hired to the contractor

Sl. No.	Description	Hire Charges per day	Place of issue
..... NIL			

SCHEDULE 'D'

Extra schedule for specific requirements/documents for the work, if any.

--- NIL ---

SCHEDULE 'E'

Reference to General Condition of Contract.	:	<i>“General Conditions of Contract for Maintenance works as posted on IITH website”.</i>
Name of the work	:	<i>“5 Years of Operation and Maintenance of 650 KLD capacity Sewage Treatment Plant-1(STP-1) at IITH campus.”.</i>
Estimated cost of work	:	<i>Rs. 5,10,04,447/-</i>
Earnest money	:	<i>Rs. 10,20,100/-</i>
Performance Guarantee	:	<i>3.0% of the accepted tendered value</i>
Security Deposit	:	<i>2.50% of the tendered value</i>

SCHEDULE 'F'

GENERAL RULES AND DIRECTIONS:

Officer inviting tender:	:	<i>Executive Engineer-Electrical, IITH</i>
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3	:	<i>See below</i>

Definitions:

2(a) Engineer -in- Charge	:	<i>Executive Engineer-Electrical, Indian Institute of Technology, Hyderabad.</i>
2(b) Accepting Authority	:	<i>Superintending Engineer, Indian Institute of Technology, Hyderabad.</i>
2(c) Percentage on cost materials and Labour to cover all overheads and profit	:	<i>15% (Fifteen) per cent.</i>
2(d) Standard Schedule of Rate	:	<i>CPWD, Delhi Schedule of Rates (DSR) 2022 Electrical, with up to date correction slips.</i>
Standard Contract Form	:	<i>IITH General Conditions of Contract for Maintenance works</i>

Clause 1

i) Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance, in days	:	<i>15(Fifteen) Days</i>
ii) Maximum allowable extension beyond the period provided in (i) above	:	<i>7(Seven) Days</i>

Clause 1A

Whether Clause 1A is applicable	:	<i>Yes</i>
---------------------------------	---	------------

Clause 2

Authority for fixing Compensation under Clause 2	:	<i>Superintending Engineer, Indian Institute of Technology, Hyderabad</i>
--	---	---

Clause 3 (VII): If the contractor had secured the contract with Government as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement-will be made ineligible.

Clause 5:

Number of days from the date of issue of letter of acceptance for reckoning date of start	:	7 days
Milestones	:	Not Applicable
Time of AMC Period	:	5 Years
Authority to give fair and reasonable Extension of time for completion of work (Web based hindrance register)	:	Superintending Engineer, IITH
Rescheduling of mile stones	:	Superintending Engineer, IITH

Clause 6:- Measurement Book

:	Applicable
	(i) For works having estimated cost more than Rs 15 Lakh – Clause 6
	(ii) For works having estimated cost Rs. 15 Lakh or less – Contractor's option of Clause 6 or to be exercised at the time of Tender Submission

Clause 7:

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	:	Rs. 5 Lakhs/-
---	---	---------------

Clause 7A:

Whether Clause 7A is applicable	:	Yes. No running account bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-charge.
---------------------------------	---	---

Clause 10A:

List of testing equipment to be provided by the contractor at site lab	:	As given in additional specifications
--	---	---------------------------------------

Clause 10B (i)- Secured advance on Materials:

Whether Clause 10 B (i) shall be applicable	:	NA
---	---	----

Clause 10C:

Component of labour expressed as percent of value of work	:	NA
---	---	----

Clause 10CA

:	Not Applicable
---	----------------

<u>Clause 10CC</u>	:	<i>Not Applicable</i>
<u>Clause 10D</u>	:	<i>Applicable</i>
<u>Clause 11:</u> Specification to be followed for execution of work	:	<u>For ELECTRICAL WORKS</u> i) <u>CPWD DSR Items:</u> CPWD General Specifications Part I Internal 2013 Part II External 1994 <u>For all Market Rate Items:</u> Particular Specifications / Manufacturers specifications
<u>Clause 12:</u> 12.2 & 12.3: Deviation limit beyond which Clause 12.2 & 12.3 shall apply for building work	:	<i>100% (as per CPWD circular No. DG/CON/313 Dt: 17.02.2021</i>
12.5 : Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work	:	<i>100% (One hundred per cent)</i>
<u>Clause 14:</u> Whether Clause 14 is applicable	:	<i>Yes.</i>
<u>Clause 16</u> Competent Authority for deciding reduced rates.	:	<i>Superintending Engineer, IIT Hyderabad up to 5% of tendered amount, beyond which, Director, IITH.</i>
<u>Clause 18:</u> List of mandatory machinery, tools & plants to be deployed by the contractor at site	:	<i>As required for the work.</i>
<u>Clause 25:</u> Settlement of disputes by Conciliation and Arbitration		
Conciliator	:	Dean (Planning)
Authority to appoint arbitrator	:	Director, IIT Hyderabad
Place of Arbitration	:	Hyderabad
Venue of Arbitration	:	IIT Hyderabad
Type of Arbitration Tribunal	:	Sole Arbitrator
Note: Provisions of Arbitration and Conciliation Act 1996 with latest amendments in force shall be applicable.		

Clause 32: *As required for the work.*

Clause 38 :

(i): Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates : *Not Applicable*

(ii): Variations permissible on theoretical quantities: : Not Applicable

Special Conditions of Contract (SCC)

1.0 Introduction

The contractor shall ensure the Operation and Maintenance of the Sewage Treatment Plant (STP) in compliance to the guidelines contained in the latest edition of the Manual on Sewerage Sewage Treatment Systems, Operations and Maintenance, published by the Central Public Health Environmental Engineering Organization (CPHEEO), Ministry of Urban Development, Government of India, New Delhi. Notwithstanding any- thing contained in the said manual, conditions laid down here under in the foregoing sections shall also apply.

1.1 Scope of Operation and Maintenance Services

The Contractor shall operate and maintain the Sewage Treatment Plant-01 under this contract for a total period of Five (5) years.

1. The Contractor shall operate and maintain the sewage treatment plant, all instruments and mechanical, electrical equipment in accordance with the quantity and quality parameters as per approved O&M manual and maintain the quality of the treated effluent as prescribed in the contract document.
2. At the discretion of the Institute, the contractor shall provide the O&M services for further three months' period beyond the five years at the same quoted rates applicable for the Fifth year. The plant equipment covered under the above contract shall be totally attended to, by the contractor including any troubleshooting to ensure smooth and trouble free operation.
3. The Equipment is operated and maintained at all times in accordance with the Operations and Maintenance manual duly approved by IITH
4. The plant is operated within the mixed liquor characteristics defined in the contract
5. The contractor shall monitor the performance of the sewage treatment plant; conduct analysis of the inlet sewage and effluent quality after treatment. Contractor shall initiate and take adequate actions to ensure smooth and satisfactory performance / running of the plant.
6. The Contractor shall prepare and implement an effective plant maintenance programme in consultation with IITH. It is an absolutely Contractors responsibility to look after all sorts of maintenance whether preventive, Minor, Major, or break-down.
7. The Contractor shall determine operating parameters, select settling (Chemical doses etc.) and generally optimize the process, and working of the treatment plant meeting the required quality parameters.

8. The Contractor should plan & procure all spares, Polyelectrolyte and all consumables including chemicals, grease, lubricating oil, cleaning agents, laboratory reagents etc.
9. The Contractor shall be responsible for keeping up-to-date record of documents including History Card for equipment and maintaining every day log book relating to various analyses performed.
10. The Contractor shall maintain and update logbook, in which details of operational parameters are recorded every day and at regular interval say hourly or as decided mutually.
11. The Contractor shall prepare and submit a weekly report of plant performance records.
12. The Contractor shall be responsible to carry out day to day periodic maintenance, necessary to ensure to smooth and efficient performance / running of all equipment / instruments comprising the sewage treatment plant and maintaining the record of the same.
13. The Contractor shall have to issue identity cards with photographs to all the staff employed for Operation and Maintenance. The list of the same shall be submitted to IITH mentioning qualification & experience.
14. The Contractor shall employ staff for operation and maintenance of the Plant as per the minimum specified here in for entire duration of O& M Services period of Five (5) years.
15. The above staff shall be distributed in three shifts and at no point of time the plant shall remain unattended. As per agreement the number of staff in each shift should always remain present otherwise penalty towards absence of any staff shall be recovered from the Contractor. The Contractor shall make the arrangement of reliever for weekly off/holiday etc., Absence on any ground like weekly off or holiday shall not be considered. The presence of staff in each shift should be marked in muster (muster shall be in electronic form by use of biometric machines logged to the computer system installed in the plant) to be maintained at office of shift-in-charge at Sewage Treatment Plant that shall be considered as final. The Contractors staff must mark their presence in this muster. The Contractor may maintain a separate register for his own purpose. Copy of muster shall be enclosed with every monthly bill.
16. The staff of Contractor shall always remain in contact with the Engineer-in-Charge or his authorized representative deployed by IITH and follow their instruction.
17. Unsatisfactory and inefficient running of the plant and unnecessary and excessive usage of spare, consumable, etc. supported by the reasons which are under control of Contractor shall be highly objected. In such cases IITH s decision shall be final and binding to the Contractor.
18. It is required that at least **once in every one month** a technical expert of contractor other than the Staff of the Contractor shall visit and audit the functionality of the plant and systems and shall suggest, if required,

to improve the efficiency and working of the plant etc. No separate payment shall be made for such visits. The visit must be recorded and outcome of the visit/minutes of the meeting should be got signed by Engineer-in-charge without which the visit shall not be considered.

19. In addition to the contractor's technical expert visit, the contractor shall arrange a visit to the plant by representative of **Technology Provider (GE) once in every six months**. The Technology Provider shall study the functioning of the plant, conduct tests on incoming sewage and treated sewage, compare the results with the specified parameters of effluent. The Technology Provider shall submit the inspection report commenting on the state of affairs of the plant, maintenance and up-keep of equipment, house-keeping, safety and environmental issues including the test results. The report shall also include suggestions for the reasons and corrective actions needed if the test results are not satisfactory and improvement of systems, in general.
20. Compliance on the issues mentioned in the inspection report of Technology Provider shall invariably be furnished by the contractor to the Engineer-in-Charge with-in one month of date of issue of inspection report. Documentary evidence shall be furnished along with compliance report substantiating the corrective action taken and the subsequent test results meeting the requirements of contract.
21. The first inspection of plant by Technology provider shall be carried out within the first six months (preferably at the end of first three months) of O& M period and subsequent visits shall be planned once in every three months until completion of total Five Years O& M period.
22. All expenses for arranging visits of Technology Provider shall be borne by the Contractor and hence the contract price for O& M Services are deemed to be inclusive of the same. Nothing extra shall be paid by IITH on this account. In case, the visit of Technology Provider is not arranged by the contractor within fifteen (15) days from the due date of visit, IITH shall arrange such visit by the Technology Provider at the risk and cost of the Contractor. All expenses incurred by IITH towards arranging the visit of Technology Provider for inspection of plant will be recovered from the ensuing bill of the contractor in addition to a penalty amount of Rs 10,000.00 for every such default on part of contractor.
23. **Contractor shall comply with all safety rules and regulations mentioned in O& M manual. IITH shall not be responsible for any accident /injury to the staff of the Contractor. Further the IITH shall not provide any insurance or medical facility to the staff of Contractor. The responsibility lies with the Contractor.**
24. All Central/State Government / Semi-Government / Labour laws and acts/Local Bodies Rules and Regulations pertaining to this contract shall be followed and observed by the Contractor without any extra

cost to IITH.

25. No accommodation / guesthouse / transportation facility shall be provided by IITH to the Contractor or his representatives. Operation & maintenance staff shall not be given any accommodation facility inside the plant (IITH) premises.
26. The Contractor shall provide the necessary tools and tackles required for day-to-day maintenance during O& M period.
27. The scope of work also includes up-keep of complete plant area premises, including floor, toilet block, railing, door, windows, light fixtures and ceiling etc. The entire premises of the plant including garden area shall also be cleaned and maintained by the Contractor regularly.
28. The work shall be done as per specified standard practices and by following labour, factory, electrical, TSPCB and all statutory rules and regulations as applied of Local, State and Central Government of India etc. .
29. Right is reserved by IITH for suspension, dismissal, termination of any staff employed by Contractor who are found to be indulging in unlawful, unethical activities.
30. Monitoring of proper functioning of plant shall be done as per approved O& M manual. Contractor has to maintain all quality parameters of effluent within stipulated limit or he shall be penalized for not maintaining the parameters specified in the contract. All expenditure incurred for the same like, suit fee, court fee, case fee, or the penalty as decided by Engineer-in-Charge and penalty charged by TSPCB or any other statutory body shall be charged to Contractor and deducted from his security deposit, bills, etc.
31. Contractor shall have to test the effluent / influent at his own cost at the plant laboratory on daily basis. The same will be verified by and checked by IITH whenever required.
32. No equipment shall remain ideal or unattended or damaged for the period of more than 3 days. If any equipment is not repaired, rectified and or replaced within 3 days, the Contractor shall be penalized with no limit at the rate of Rs. 2000/- per day delay per each individual equipment of the plant. In case, the contractors fails to attend the faults within 3 days, the same shall be attended by IITH at the risk and cost of the contractor
33. During Operation & Maintenance period, Contractor has to supply all the spares, at his cost during preventive, major-minor breakdown, replacement and maintenance work. No extra payment shall be made for such maintenance on any ground. No separate payment for the same shall be made by the IITH irrespective of the number of such break down / minor, major repairs replacements.

34. At the time of handing over of the plant to IITH after the end of O& M period, all equipment of plant shall be in good working condition.
35. Operation and maintenance of PLC based automation system and all instruments installed in the STP shall be the responsibility of the Contractor. All repairs, replacements towards the entire instrumentation works during the O& M period shall be in the scope of Contractor.
36. The Contractor shall also dispose off the sludge, screenings, grit and any other material to the satisfaction of IITH at his own cost. However, IITH shall have full rights on the dried sludge for using for its internal purposes.
37. At the time of handing over of the plant on completion of O&M period, the contractor shall handover all records pertaining to the plant like Operating Manuals, Warranty Certificates, AMC copies, registers of Tests/flow particulars, charts, third party reports etc. to IITH.
38. **Output and Operational Guarantees:** The Contractor is fully responsible for treating all the Sewage reaching at the Common Collection Sump. The performance of the Contractor shall be treated as unsatisfactory if he fails to treat the complete sewage or does not maintain the guarantees mentioned in the contract excepting in force majeure condition or fails to fulfil other conditions of the contract.
39. **Treated Effluent Quality:** The Contractor shall operate the Sewage Treatment Plant in such a way that the treated effluent quality attains parameters as prescribed in this contract document.
40. The scope of O&M Services includes softening of the treated sewage water after the process of Ultra filtration of MBR. The quantity of effluent to be softened per day shall be a minimum of **2,50,000 litres**. The hardness of the softened water shall be less than 50 mg/l. The softened water shall be made available in the soft water tank. All equipment, consumables required for softening of the effluent shall be borne by the contractor and nothing extra shall be payable on this count. IITH will utilize this soft water for make-up water of HVAC system.
41. **Chemical Requirements:** All chemicals and other consumables consumed to operate the Sewage Treatment Plant and other facilities under this contract shall be borne by the Contractor.
42. **Adverse Operating Condition:** During which the raw sewage quality deteriorates beyond the Specifications contained in contract, the following provisions shall be applicable:
 - a) If the raw sewage can still be treated to meet the Output Standards, the Contractor shall comply with such specifications.
 - b) In the event it is not possible to meet the Output Standards, the Contractor shall immediately inform IITH

and take all corrective measures at his own cost and risk to ensure that the prescribed output standards are achieved.

43. Test to be carried during O & M period: Sampling and testing to be carried out for the parameters given below: This schedule shall also be maintained during the O& M period. Sampling shall be done in accordance with BIS 3025.

- (i) Inlet chamber at sewage treatment plant for flow, BOD, pH, suspended solids(SS), temperature, COD , oil & grease, TDS ; Outlet of the sedimentation units for BOD, suspended solids, pH, COD and oil grease, TDS.
- (ii) Inlet of the reactor unit for MLSS, Dissolved Oxygen pH.
- (iii) Outlet of the reactor unit for Dissolved Oxygen, Sludge volume Index pH.
- (iv) Outlet of the secondary treatment units for BOD, Suspended solids, pH, COD and oil grease
- (v) Outlet of the chlorination units for BOD, Suspended solids, pH
- (vi) Excess sludge for Volatile suspended solids, total solids, specific gravity
- (vii) Various parameters to be tested by online monitoring system at these locations as per specific requirements of Instrumentation.
- (viii) Residual Free Chlorine after Chlorination.
- (ix) Hardness of softened water
- (x) Total Coliform

44. The Contractor shall get analysed the untreated as well as treated sewage samples once in every three months from TSPCB or any other lab approved by the Engineer- in-Charge for all parameters mentioned in Table 3.1 and Table 3.3 specifying the characteristics of treated sewage. The necessary lab testing charges will be reimbursed by the Institute on actuals. The TSPCB Vigilance testing charges for samples directly collected by TSPCB are also reimbursable to the Contractor. The Contractor shall ensure adherence to standard protocols of collection and storage of samples.

1.1.1 Calibration of Instruments

All the measuring instruments and other devices shall be calibrated regularly as mentioned below:

- (i) The instruments and devices shall be calibrated by the plant Manager or any authorized specialized staff of the Contractor once in every two months.
- (ii) All such instruments shall be calibrated once in every twelve months by approved third party specialized agency.
- (iii) Immediately after calibration, the results/ reports shall be submitted to IITH.

- (iv) First calibration by approved third party specialized agency shall be done after twelve months of commencement of O& M period.

1.1.2 Contractors staff during OM period

a. Key Staff:

The minimum key staff required for O & M Services shall be as given below. Non- deployment of the personnel during O&M as per the contract shall lead to imposition of penalty as mentioned in Contract.

1. One Electro-Mechanical Engineer (Plant Engineer)

A Degree in Mechanical or Electrical Engineering or a Bachelor degree in Science (B.Sc.) with chemistry as one of the major subject from a recognized university/ Institute with minimum 06 years' experience in Operation & Maintenance of any STP.

2. **Plant Operator:** One per each shift with minimum 7 years' experience in maintaining STP. CVs of key staff shall be submitted at the commencement of O & M period and shall be subject to approval of E-I-C.

- b. **Non Key Staff :** The contractor must deploy adequate number of non -key staff comprising of operators, skilled technicians, semiskilled and unskilled labourers to discharge the contractual liabilities of operation and maintenance and other essential activities of upkeep of the plant.
- c. Institute shall monitor the presence and availability of such key and non-key staff. As specified elsewhere in the contract document, the contractor shall maintain the attendance in biometric form for all the staff so deployed.
- d. No labour below the age to 18 years shall be employed on the work. List of all key and non key staff deputed at site along with their ID proofs (Aadhar card/Voter card/DL etc.) is to be submitted by the contractor to IITH and advance intimation to be given before deputing/removing any staff from site during the period of contract. Not more than one of the contractor's key staff shall be absent from the plant premises any given time, the contractor shall provide replacement of equivalent or better qualifications. The CV's of such key staff replacements shall be got approved from E-I-C in advance.
- e. The contractor shall pay to all the Operation & Maintenance (O&M) staff deployed at IITH, the latest applicable minimum rates of wages as prescribed by Ministry of Labour & Employment, Govt. of India for Hyderabad City for Construction or Maintenance works. Any revision in wages as per Govt. of India shall be payable to the O & M staff by the contractor during contract period only, without any additional cost implication to IITH. The contractor will be at liberty to pay any deputed O & M staff higher wages than the minimum wages rates prescribed by Chief labour Commissioner, Govt. Of India.

- f. Engineer-in-Charge(EIC) shall be empowered to direct the contractor to remove any or all staff employed on O & M of the plant if in his opinion continued presence of such staff is detrimental to safety or proper O&M of the plant. Whenever the Engineer-in-Charge informs the Contractor in writing that any person on the work is in his opinion unsatisfactory or/incompetent or unfaithful or dishonest, untruthful or disorderly or to be otherwise unsuitable, such person shall be discharged by the Contractor from the work and shall not be employed again on it. The Contractor shall comply with such directions and immediately deploy suitable substitute(s) thereof.

1.1.3 Safety and Security

The Contractor shall take all safety precautions under various Acts/Rules under central/State Govt. from time to time and he shall be responsible for safety of its staff and the consequences thereof. The contractor shall be responsible for the safety of the plant, equipment and personnel during O&M period.

1.1.4 Responsibility for damages

- (a) Safety of the whole of the plant shall remain with the Contractor who shall be responsible for all accidents or damages from whatever cause arising and chargeable for anything that may be stolen, removed, destroyed or damaged to whomsoever belonging and also for making good all defects and damages to the said works or to any property adjoining or any cause whatever, whether such damage or defects were occasioned by the negligence of the Contractor or not or may be or might have been discovered during the progress to be known after the completion whereof or whether payment may wholly or partially have been made or the /works approved as supposed to have been properly done and no certificate of approval of any works by any statutory bodies shall affect or prejudice the right of IITH against the Contractor or be considered or held as at all conclusive as to the sufficiency of any work materials.
- (b) Adequate safety precautions against fire, flooding, lightening, electrical shocks, accident due to moving/non-moving heavy/light equipment shall be strictly taken up by the Contractor at his own cost. Suitable safety measures like gumboots, gloves, safety belts, ladders, safety lamps, gas masks, Oxygen apparatus, insulated tools, alarms etc. shall be provided by the Contractor. Necessary medical first aid kit shall be made available all the time. In absence of observance of above safety precautions, the Contractor shall be responsible for any unforeseen loss of the equipment or persons dealing with it. Special care shall be taken by the Contractor while carrying out the work in sewage gas zone. Any incidence of human life or accident shall be totally Contractor's responsibility.
- (c) The Contractor shall ensure that the staff employed are adequately skilled and trained and takes all necessary precautions while carrying out the work as per Indian Electricity Rules/Factory Act/CPHEEO

Manual/Approved Operation Manual or manufacturer's special instruction for safety / gas handling. The staff should use all protective and safety equipment which should be provided by the contractor during operations.

- (d) In the event of any accident on or off site, in which the Contractor or his personnel are involved, in which an injury occurs to any person whether directly concerned with the project or a third party, the Contractor shall inform IITH within 24 hours of the occurrence of the event. The plant shall be open to local/state/central agencies for verification of safety/emission/acts compliance.
- (e) During night hours, the main gate should be locked. However, shift duty staff should be alert and open the gate during surprise checking of IITH staff or any other Government Authorities or his nominee without any wait. Only bonafide persons shall be allowed in the plant premises being a prohibited area. Smoking and drinking liquor are prohibited in the plant. The staff engaged shall wear common uniform with name plate indicating name and designation during duty hours.
- (f) All staff of the contractor deployed on the plant for O & M shall carry valid identity cards issued by Contractor and duly counter-signed by Engineer-in-Charge.

1.1.5 Reporting

The Contractor shall prepare daily and monthly reports (in approved formats) of pumping/treatment and project performance and submit to IITH and shall assist IITH in preparing the necessary documents for their purpose and record as per Performa given from time to time. The reports shall contain the following:

- Raw Sewage quantity, quality and effluent quality as per the on-line monitoring programme and other tests as specified in this section and print outs of online monitoring shall be submitted to Engineer-in-Charge.
- A description of the maintenance work carried out in the reporting period. A report on major failures, if any, their causes and remedial actions taken.
- Sludge quality and quantity (daily basis) in the reporting period.
- Power and chemicals consumed in the reporting period.
- An inventory of the chemicals and spare parts available at the end of the reporting period.
- O&M staff deployed by the Contractor during the reporting period.
- Major repair works carried out, if any
- . Near misses and other accidents happened during period under report.

1.1.6 Record Keeping

Contractor is required to maintain separate register as well as computerized records at STP of following information:

- Pumping register
- Quantity of sewage treatment and performance register
- Working hours register
- Electricity break down register
- Maintenance register
- Staff attendance register in the form of computer generated log sheets of biometric attendance.
- Monthly Electricity consumption register
- AMC with OEM register
- Equipment breakdown, repair record and extent of repair
- Chlorination equipment and chlorine toner operating and using register
- Soft water quantity register
- Any other registers/ records as may be required by the Engineer-in-Charge.
- In addition to the above, the contractor shall also submit two sets of asset registers containing details of: all major electro-mechanical equipment, instrumentation like various operating machines such as Manual and Mechanical Screens, Mechanical Grit Removers, Pumps, Motors, Scrapers, Air Blowers, Centrifuge, all equipment related to PLC and Automation, etc. The information shall include the make, model number, serial number, book value, warranty, particulars of OEM etc.,

One set of the assets register shall be kept in the control room and maintained by the Plant Engineer.

- Records of effluent quality and other laboratory tests are kept in the laboratory as per testing schedules.
- The record with respect to flow shall be maintained by Contractors as per table below.

The concerned staff passes the daily log sheet to the plant Manager on the subsequent day duly signed. The plant Manager shall verify the daily record as well as the calculations and shall be responsible to generate further data using these.

Table 3.5: Hourly Record of Flow

Date/Time	Head Over Notch/ Weir / Meter	Rate of Flow	Average Rate of Flow in past Hour	Flow Quantity
0600				
0700				
0800				
0900				
-				
-				
1400				
1500				
1600				
-				
-				
0000				
0100				
-				
-				

1.1.7 Site Order Book

A Site order Book shall be kept by the Engineer -in-charge at the plant site. Orders entered in this Book by the Engineer-in-Charge or his authorized representative shall be held to have been formally communicated to the Contractor. The Engineer-in- Charge or his authorized representative shall sign each order as it is entered and shall hand over the duplicate to the Contractor or his staff, who shall sign the original in acknowledgment of having received the order.

1.1.8 Operations

- (a) In case, the motor or any other equipment is burnt or damaged due to negligence of the Contractor or due to faulty operation it shall be sole responsibility of the Contractor to rewind/replace/repair it as per standards of the equipment free of cost. In case of any fault in operation and performance of the plant, Contractor or his staff at duty shall immediately report to IITH about it.
- (b) The Contractor shall run the plant after ensuring proper voltage. He shall also record all the power failures and voltage, current, power, KWH in daily log sheet. He shall bring it to the notice of Engineer-in-Charge about the breakdown/power failure. He shall also get the electricity restored simultaneously.
- (c) Any dispute with the workmen shall be Contractors responsibility as per Labour Laws/Govt. Rules and Regulations. In no way IITH shall be responsible for the disputes between them. The Contractor shall follow the rules and regulations as per rules of the Government and applicable laws.
- (d) The Contractor shall arrange all necessary required tools, tackles and instruments in advance for proper operation and maintenance of the entire plant. The Contractor shall operate and maintain all (E&M)

equipment as per the recommendations of the respective equipment manufacturer. He shall further maintain and operate the plant, as per CPHEEO manual to obtain the treated effluent results as per approved norms specified in this document elsewhere.

- (e) The floating material/scum, if any, should be collected in bins and dispose the same in open pits away from the plant & machinery which should be dried and disposed off regularly at a location outside the plant and approved by statutory authority. During rainy season, this should be buried after using lime.
- (f) The screened material, grit and the dried sludge cake from the centrifuge should be collected in tractor or by appropriate means and the same shall be disposed off at site /yard within the battery limits, away from the plant. The screened material, grit and any other non-useful material so collected and accumulated over a period of time shall be removed at regular intervals from the STP and IITH premises by transporting the same using mechanical means to approved municipal dumping ground.

1.1.9 Maintenance

- a. The work shall be carried out and completed under the exclusive control direction and supervision and to the satisfaction of Engineer-in-Charge. Engineer-in-Charge shall likewise have full power to reject or condemn any work or material that he may deem unsuitable. In case of any work or material being rejected by the Engineer in-charge, the Contractor shall immediately remove and replace the same to the satisfaction of Engineer-in-Charge or Engineer-in-Charge shall have full powers to get the same removed and replaced and deduct the expenditure incurred in the process from any amount due or that may become due to the contractor.
- b. The Contractor shall use only the original and genuine spares of the original equipment as per recommendations given in the maintenance booklet of the manufactures/as per directions of Engineer-in-Charge. Adequate stock of such spares is to be maintained by the Contractor. Test certificate of manufacturer is required for bearings along with supplies. Test certificate of all major equipment shall be submitted from the manufacturer.
- c. If any material brought to the site, be in the judgment of the Engineer-in-Charge, found inferior or improper & not as per described standards, the said materials or workmanship shall, where required by Engineer-in-Charge, shall be removed or amended by the Contractor forthwith.
- d. The Engineer-in-Charge is authorized to remove or cause to be removed the materials and workmanship so objected to or any part thereof and replace the same with such other materials and workmanship as shall be satisfactory to him and there upon the Contractor shall on demand repay to IITH the expenses incurred there by or to which the IITH may be put or be liable in connection therewith, the amount thereof to be certified by the Engineer-in-Charge whose certificate shall be final.

- e. The Contractor shall also be responsible to maintain cleanliness in around the plant including electro-mechanical equipment, disposal of floating material removed from the bar screens etc., Grit and other unwanted material and keep the premises in a tidy condition. The terraces of the STP building shall be always kept free of debris, junk, waste material, vegetation etc.
- f. All leakages should be attended promptly to avoid unhygienic conditions, deterioration of plant and building. Chokages of Electro-Mechanical equipment, sewer lines of STP building, rain water pipes, storm water drains should be removed at once. All the valves/gates which are not used regularly should be operated at least once a week and make sure that they are properly lubricated /greased.
- g. All safety valves should be checked daily and ensure that they are working properly. In case of any fault the same should be attended immediately without any wait. The maintenance of the plant shall be as per maintenance manuals of the manufacturer for all equipment's. Contractor shall keep all the safety devices in working order.
- h. The Contractor should make sure that no unwanted material should float/grow in and around different units. In case it is found the same shall be removed /cleaned immediately. He shall also be responsible for cleaning/sweeping the plant buildings inside and outside, roads, foot path etc.
- i. Weirs of reactors etc shall be maintained clean round the clock. During preventive/ breakdown maintenance, the Contractor shall visit the unit/units as and when needed. The pumping units or any other machinery required, if any, shall be arranged by the Contractor at his own cost for completing the preventive maintenance work. In case of battery operated auto system panels, system alarm etc., batteries are required to be maintained and replaced as and when needed by the Contractor.
- j. The Contractor shall provide necessary protection systems wherever necessary including alarms. Cautionary Sign boards shall be placed at appropriate locations
- k. The Contractor shall maintain the Supervision Control and Data Acquisition System (SCADA) in working condition for the 5 years of O & M period. The Contractor shall not remove/shift any equipment/machinery even temporarily without written permission of Engineer-in-Charge.
- l. POL (Petrol/Diesel Oil & Lubricants) has to be arranged by the Contractor as and when needed as per manufactures recommendations for periodical maintenance of entire plant. IITH shall not provide such items.
- m. The Contractor shall have to carry out periodical testing of the installations/equipment as per CPHEEO manual and Indian Electricity Rules as amended up to date and shall have to maintain complete record

in the maintenance register.

- n. IITH shall be at liberty to post its staff for surveillance/ inspection at the plant with access to all units, control room and records, log books, MIS (Management Information system), data etc. round the clock as required. The logbooks will be attested by the authorized IITH Officials and this record shall be open for further inspection/checking by IITH and all other Government Agencies CPCB/TSPCB etc. for further action/improvements/rectifications.
- o. In case of major repair due to normal wear and tear/break down, the Contractor should bring the same to the notice of IITH immediately and necessary measures for its repair/replacement should be taken simultaneously. Breakdown, all repairs of any kind are to be attended by the Contractor. Any unit/equipment being irreparable in the opinion of IITH shall be replaced by the Contractor at no cost to IITH.
- p. The Contractor shall give his telephone no., contact addresses, etc. to Engineer-in- Charge as well as shift duty shift staff to contact him/them during emergency/odd hours etc. The mobile number of the authorized representative of the contractor and that of plant manager shall be displayed on notice board placed at a prominent location in the STP building.
- q. The contractor shall arrange a white notice board in the control room of STP and all details like sewage volume handled/treated, treated water volume, test results etc, shall be displayed on daily basis.
- r. The contractor shall display in the control room a schematic flow diagram and the layout of the plant and equipment.

1.1.10 Routine, Preventive, Minor & Major maintenance

Routine, Preventive, Minor & Major maintenance of all Electrical, Mechanical, hydraulic machines & Equipment of the plant as listed below shall be the responsibility of the contractor.

- a. Routine & preventive maintenance of electrical /Mechanical/ hydraulic/ machines equipment is to be carried out as per the approved operation & maintenance manual. Minimum oil & grease requirement for one-year Operation & maintenance of the Plant to be procured by the Contractor well in advance.
- b. The Contractor should prepare schedule of daily maintenance preventive maintenance of all the equipment & machinery operated & run by him in the premises of the plant. The schedule should be as per the guidelines mentioned in the contract & as per the approved O & M manual. The scope covers Routine, Preventive, Minor & Major maintenance of all major minor equipment's, and machines in the Plant like Submersible pumps, blowers, Coarse & Fine screens, Grit Removal Mechanism, Channel gates, Decanters, Sludge pumps, Centrifuge feed pumps, Centrifuges, hollow fibre membranes etc. All dosing

systems including Chlorine Dosing equipment, etc.

- c. The scope also covers Routine, Preventive, Minor & Major maintenance of all the instrumentation system installed like PLC, Actuators, Flow meter's level indicators etc. The Contractor should also carry out Routine, Preventive, Minor & Major maintenance of all major minor electrical equipment like Electrical Panels, Switch Gears, Power Cables, Control cables, Changeover switches etc. so as to ensure uninterrupted round the clock operation of the Plant.
- d. The Contractor should maintain all civil structures including office/ Store room, Storm water drains, fencing etc in a neat manner. He should maintain all civil structures of the plant sturdy to complete the natural/designed lifetime. The Contractor should carry out the safety audit of the plant & necessary certificate from the competent authorities must be obtained.
- e. The Contractor should procure and keep stock all the spares required for all types of maintenance in advance in sufficient quantity. The brand/make of the part/equipment/machine to be repaired /replaced should be as per IITH approved list & as per the approved O & M manual or as per the existing manufacturers brand.

1.1.11 Release of Hazardous Substances or waste, if any

- (a) The Contractor, after first notifying the IITH/TSPCB shall be responsible for fulfilling all requirements associated with any release of any substance into the environment as required by Applicable law or by any Legal Entitlement including but not limit to the notification or reporting of releases / Hazardous substances or Hazardous Waste. The Contractor shall prepare a memorandum evidence such notification or reporting and provide copies thereof to IITH, along with any documents provided to the relevant regulatory agency regarding such release.
- (b) The Contractor shall assist IITH in the process of obtaining clearances of all such agencies as required for the purpose, including all clearances during O&M period. He shall be fully responsible to comply with all requirements of Laws including hazardous substances, emission standards for air, discharge standards for effluent oil, sub-soil pollution. The Contractor shall not release any hazardous/toxic materials inside the premises.

1.1.12 Technical Audit

Engineer-in-Charge has the right to conduct a technical audit of the plant and to perform any analysis or inspection he deems necessary. The Contractor shall at his cost provide all assistance IITH requires to complete these inspections. Such audits may cover all or any of the obligations of the Contractor, including without limitation:

- (a) Verification of the system capacity with due allowance for normal wear and tear during the O&M Period.
- (b) Verification of the performance standards and useful life of the individual assets of the Facility, with due allowance for normal wear and tear during the O&M Period.
- (c) Verification of the capacity of the Facility to meet Output Standards during the residual life of the Facility with due allowance for normal deterioration expected during such residual life.
- (d) Sampling, testing and verification of the Output Standards for treated sewage, sewage losses.

1.1.13 Inspection

- (a) At any time or at the end of each twelve-month period, or at the initiative of the TSPCB, a visit shall be organized so that both parties can check the condition of the installations at the facility.
- (b) A report shall be drawn up to record the opinions of the both parties. IITH/TSPCB reserves the right to call the Technology Provider, equipment manufacturers or specialized technicians for these visits.

1.1.14 Taking Over of Plant after Completion of O & M Period

The plant shall be taken over by IITH on satisfactory completion of the Operation & Maintenance of the plant provided:

- a. The plant /equipment are in good, smooth running condition. The results of the treated waste water quality for the preceding three months of operation of the plant are within the limits specified.
- b. In case of major repairs /replacement of equipment, the performance guarantee for such unit/equipment shall be extended by six months from the date of putting back in to satisfactory operation of such unit/equipment, in case such putting back is within last three months of the end of completion of operation & maintenance period.
- c. All records of operation & maintenance are handed over to IITH in proper condition.
- d. In case taking over of the STP is delayed on account of Contractor's failure, the operation & maintenance period shall be extended further till he meets the requirement without any extra cost to IITH.

1.1.15 Tender Drawings

For better understanding of the bidder, the following tender drawings are enclosed with the tender:

- a) Process Flow Diagram
- b) Piping & Instrumentation Diagram

3.1 Form of Performance Security (Guarantee) Bank Guarantee Bond

Performance Security (Guarantee) Bank Guarantee Bond

In consideration of the Director, IITH (hereinafter called The Government) having offered to accept the terms and conditions of the proposed agreement between and (hereinafter called the said Contractor(s)) for the work (hereinafter called the said agreement) having agreed to production of an irrevocable Bank Guarantee for Rs..... (Rupees only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We, (hereinafter referred to as the Bank) hereby undertake to pay to the Government an amount not exceeding Rs. (RupeesOnly) on demand by the Government.
2. We, (indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupees only)
3. We, the said bank further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor(s) shall have no claim against us for making such payment.
4. We, (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer- in-Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.
5. We, (indicate the name of the Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner

our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee shall not be discharged due to the change in the constitution of the Bank or the Contractor(s).
7. We, (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.
8. This guarantee shall be valid up to.....unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the day of for.....(indicate the name of the Bank).

NOTES ON PRICE BID

- 1) The bidder is required to quote all-inclusive monthly charges for various years of Operation & Maintenance.
- 2) Rates shall be quoted in both figures as well as words. In case there is any discrepancy between the rates quoted in figures and words, the rates quoted in words will be considered.
- 3) The list of Instruments, equipment's and valves given along with this document is indicative only. Bidders are advised to visit the site thoroughly before quoting rates.
- 4) IITH being educational institution, there will be a variation in the quantity of sewage generated depending upon academic activities. The contractor shall not have any claims if the influent is more than 650KLD on any day on any period. Similarly, there shall not be any recovery from the contractor if the quantity of sewage treated is less than 650KLD on any day or period.
- 5) During the period of Operation & Maintenance of plant, monthly running account bills shall be raised by the contractor by 7th of every month in prescribed proforma (CPWA 27A). IITH shall endeavour to make payment of monthly running bills within 10 working days from the date of receipt of bills complete with all supporting documents/reports etc. in the office of Engineer-in-charge, IITH.
- 6) The tendered amount shall be inclusive of all applicable taxes to this contract.
- 7) Other Taxes: Income tax/surcharge/cess or any other tax as applicable on the amounts paid by IITH shall be recovered at source at applicable rates as notified by Govt. of India and a certificate to this extent shall be issued to the contractor.

ANNEXURE-I

FORM FOR CERTIFICATE OF NET WORTH FROM CHARTERED ACCOUNTANT

It is to certify that as per the audited balance sheet and profit & loss account during the financial year 2020-21, the Net Worth of M/s _____(Name & Registered Address of contractor/ Individual/firm/company), as on _____(the relevant date) is Rs._____after considering all liabilities. It is further certified that the Networth of the company has not eroded by more than 30% in the last three years ending on (the relevant date).

Signature of Chartered Accountant

Name of Chartered Accountant

Membership No. of ICAI

Date and Seal

ANNEXURE-II

INDEMNITY BOND (VIOLATION OF LAWS, NORMS, ACCIDENTS, DAMAGES ETC)
(On Non-Judicial Stamp Paper of Rs.100/-only)

Name of the work: 5 Years of Operation and Maintenance of 650 KLD capacity Sewage Treatment Plant-1(STP-1) at IIT Hyderabad campus

KNOW all men by these presents that I/We _____ (Name of Contractor with address) do hereby execute Indemnity Bond in favour of Indian Institute of Technology(IIT) Hyderabad having their office at Kandi, Sangareddy-502284, Telangana, India and for the project IIT Hyderabad under consideration.

On this day of2022

THIS DEED WITNESSETH AS FOLLOWS:

I/We, (Name of Contractor) hereby do indemnify and save harmless IITH having their office at Kandi-502284, Sangareddy, Telangana, India from the following: -

1. Any third party claims, civil or criminal complaints/liabilities/material/life loss during site mishaps and other accidents such as snake bites etc or disputes and/or damages occurring or arising out of any mishaps at the site due to faulty work, negligence, faulty construction and/or for violating any law, rules and regulations in force, for the time being while executing/executed civil works by me/us.
2. Any damages, loss or expenses due to or resulting from any negligence or breach of duty on the part of me/us or any sub-Contractor/s if any, servants or agents.
3. Any claims by an employee of mine/ours or of sub-Contractors if any, under the workman compensation act and employers' Liability act, 1939 or any other law rules and regulations in force for the time being and any acts replacing and/or amending the same or any of the same as may be in force at the time and under any law in respect of injuries to persons or property arising out of and in the course of execution of the Contract work and/or arising out of and in the course of employment of any workman/employee.
4. Any act or omission of mine/ours or sub-Contractor/s if any, our/their servants or agent which may involve any loss, damage, liability, civil or criminal action.

IN WITNESS WHEREOF THE HAS SET HIS/THEIR HANDS ON THIS DAY OF SIGNED AND DELIVERED BY THE AFORESAID IN THE PRESENCE OF WITNESSES:

- 1.
- 2.

ANNEXURE-III

Proforma for Authorization certificate from Technology Provider
(M/s Suez Water Technologies & Solutions(I) Pvt. Ltd.

REF.No. _____

Dated _____

To,
The Executive Engineer-Electrical,
Indian Institute of Technology (IIT) Hyderabad
Kandi-502284, Sangareddy, Telangana, India

Dear Sir,

We _____ who are established and reputable manufacturers/Technology Providers of _____ having factory/ factories at _____ (*address of factory*) do hereby authorize M/s _____ (*Name and address of bidder*) to submit a bid, negotiate and receive the order from you against your Tender enquiry no. IITH/CMD/ELE/NIT/2022-23/05 for the

5 Years of Operation and Maintenance of 650 KLD capacity Sewage Treatment Plant-1(STP-1) at IIT Hyderabad campus

We ensure that we shall support/ facilitate the M/s _____ on regular basis with technology / product updates for up-gradation / maintenance / repairing / servicing of the STP-01 at IIT Hyderabad during the 05years contract (if awarded) as per the terms and conditions mentioned in this tender document on direct payment basis from the successful bidder.

We hereby extend our full guarantee for the services offered by the above firm.

Yours faithfully,

(Name of authorised signatory
with signature)


(Name of manufacturer with
stamp)

Note: This letter of authority should be on the **letter-head of the Technology Provider** and should be signed by an authorised person. It should be enclosed by the Bidder with the tender documents.

42

**MAHANKAL
I SATEESH**

Digitally signed by
MAHANKALI SATEESH
Date: 2022.10.10
19:24:08 IST

 suez Water Technologies & Solutions	Project No.	6038727
	Project	650 KLD STP -1
	Customer	IIT HYDERABAD

Doc No. 6038727-AE-01

EQUIPMENT LIST

**APPROVED BY
TECHNOLOGY PROVIDER**




B	JUNE 26, 2018	FOR APPROVAL	SK	SCR	MAB
Rev.	Date	Description	Prepared	Checked	Approved



EQUIPMENT LIST

SL NO.	TAG NO.	DESCRIPTION	SIZE / CAPACITY DIMENSION VOLUME	FLOW	PRESSURE (BAR G)	QUANTITY	UNIT OF MEASUREMENT	MCC	SHAFTS WEIGHT PER UNIT IN KGS	WORKING WEIGHT PER UNIT IN KGS	REV/NO. B
1	25TK-101	COARSE SCREEN	452 m3	152.2 m3/hr	Atm	1	NO	RCC	-	-	RAW SEWAGE
3	25TK-101	COLLECTION RAMP	16 mm MESH SIZE	152.2 m3/hr	Atm	1	OT	RCC	-	-	AIR
4	25TK-101	FINE SCREEN	8 mm MESH SIZE	152.2 m3/hr	Atm	1	NO	SS304	135	135	RAW SEWAGE
5	25TK-101	COARSE SCREEN	16 mm MESH SIZE	152.2 m3/hr	Atm	1	NO	SS304	483	483	RAW SEWAGE
6	25TK-101	OIL & GREASE BELL TYPE OIL SKIMMER	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
7	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
8	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
9	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
10	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
11	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
12	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
13	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
14	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
15	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
16	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
17	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
18	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
19	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
20	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
21	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
22	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
23	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
24	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
25	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
26	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
27	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
28	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
29	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
30	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
31	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
32	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
33	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
34	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
35	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
36	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
37	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
38	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
39	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
40	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
41	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
42	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
43	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
44	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
45	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
46	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
47	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
48	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
49	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
50	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
51	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
52	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
53	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
54	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
55	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE
56	25TK-101	EQUALIZATION TANK	300 m3	152.2 m3/hr	Atm	1	NO	STANDARD	213	250	RAW SEWAGE

44

 suez Water Technologies & Solutions	Project No.	6038727
	Project	650 KLD STP -1
	Customer	IIT HYDRABAD

Doc No. 6038727-IK-01

INSTRUMENT LIST

APPROVED BY
TECHNOLOGY PROVIDER



A	MAR 30, 2018	FOR INFORMATION	RR	RK	BPU
Rev.	Date	Description	Prepared	Checked	Approved

45

**MAHANKALI
I SATEESH**

Digitally signed by
MAHANKALI SATEESH
Date: 2022.10.10
19:24:08 IST

SR. NO.	TAG NO.	INSTRUMENT DESCRIPTION	INSTRUMENT TYPE	SERVICE	P & ID DRAWING NO.	OPERATING				REMARKS		
						Flow (m ³ /hr)	Pressure (bar)	Temp (Deg C)	DATE			
INSTRUMENT LIST						REV	DATE	BY	CHK	APP	REMARKS	
INSTRUMENT LIST						A	30/03/2018	HR	HR	HR	4" MS ANBI B 16.5 150 # FLANGE	
INSTRUMENT LIST						REV	DATE	BY	CHK	APP	REMARKS	
INSTRUMENT LIST						A	30/03/2018	HR	HR	HR	4" MS ANBI B 16.5 150 # FLANGE	
INSTRUMENT LIST						REV	DATE	BY	CHK	APP	REMARKS	
INSTRUMENT LIST						A	30/03/2018	HR	HR	HR	4" MS ANBI B 16.5 150 # FLANGE	
1	01-LS-101	LEVEL SWITCH	TILT (2-POINT)	COLLECTION SUMP TANK LEVEL	01 OF 10	NA	ATM	25-50	TBD	HIGH+TBD/LOW+TBD	MM	4" MS ANBI B 16.5 150 # FLANGE
2	01-PI-101A-1	PRESSURE INDICATOR	DAPHRAGM SEAL	EQUALIZATION TANK FEED PUMP-1-A DISCHARGE PRESSURE	01 OF 10	NA	1.10	25-50	0-2.5	0-2.5	bar	1/2" MNPT
3	01-PI-101B-1	PRESSURE INDICATOR	DAPHRAGM SEAL	EQUALIZATION TANK FEED PUMP-1-B DISCHARGE PRESSURE	01 OF 10	NA	1.10	25-50	0-2.5	0-2.5	bar	1/2" MNPT
4	08-LS-101-1	LEVEL SWITCH	TILT (2-POINT)	EQUALIZATION TANK LEVEL	01 OF 10	NA	ATM	25-50	TBD	HIGH+TBD/LOW+TBD	MM	4" MS ANBI B 16.5 150 # FLANGE
5	08-PI-101A-1	PRESSURE INDICATOR	DAPHRAGM SEAL	BIOREACTOR FEED PUMP-1-A DISCHARGE PRESSURE	01 OF 10	NA	0.90	25-50	0-2.5	0-2.5	bar	1/2" MNPT
6	08-PI-101B-1	PRESSURE INDICATOR	DAPHRAGM SEAL	BIOREACTOR FEED PUMP-1-B DISCHARGE PRESSURE	01 OF 10	NA	0.90	25-50	0-2.5	0-2.5	bar	1/2" MNPT
7	08-FI-101-1	FLOW TRANSMITTER	ELECTROMAGNETIC	AUTO DRUM SCREEN FEED FLOW	01 OF 10	35	NA	25-50	0-35	0-35	m ³ /hr	3" CS ANBI B 16.5 150# FLANGE
8	16-PI-402A-1	PRESSURE INDICATOR	BOURDON	PROCESS AERATOR BLOWER-1-A DISCHARGE PRESSURE	02 OF 10	NA	0.55	25-90	0-1	0-1	bar	VENDOR SCOPE
9	16-PI-402B-1	PRESSURE INDICATOR	BOURDON	PROCESS AERATOR BLOWER-1-B DISCHARGE PRESSURE	02 OF 10	NA	0.55	25-90	0-1	0-1	bar	VENDOR SCOPE
10	16-PI-401A-1	PRESSURE INDICATOR	BOURDON	PROCESS AERATOR BLOWER-1-A SUCTION PRESSURE	02 OF 10	NA	ATM	25-60	NA	NA	bar	VENDOR SCOPE
11	16-PI-401B-1	PRESSURE SWITCH LOW	DAPHRAGM	PROCESS AERATOR BLOWER-1-B SUCTION PRESSURE	02 OF 10	NA	ATM	25-35	NA	NA	bar	VENDOR SCOPE
12	16-PI-402B-1	PRESSURE INDICATOR	BOURDON	PROCESS AERATOR BLOWER-1-B SUCTION PRESSURE	02 OF 10	NA	ATM	25-60	NA	NA	bar	VENDOR SCOPE
13	16-PS-401B-1	PRESSURE SWITCH LOW	DAPHRAGM	PROCESS AERATOR BLOWER-1-B SUCTION PRESSURE	02 OF 10	NA	ATM	25-35	NA	NA	bar	VENDOR SCOPE
14	20-PI-201A-1	PRESSURE INDICATOR	BOURDON	MEMBRANE AERATION BLOWER-1-A DISCHARGE PRESSURE	02 OF 10	NA	0.46	25-90	0-1	0-1	bar	VENDOR SCOPE
15	20-PI-201B-1	PRESSURE INDICATOR	BOURDON	MEMBRANE AERATION BLOWER-1-B DISCHARGE PRESSURE	02 OF 10	NA	0.46	25-90	0-1	0-1	bar	VENDOR SCOPE
16	08-PI-102A-1	PRESSURE INDICATOR	BOURDON	MIXING BLOWER-1-A FOR EQ TANK DISCHARGE PRESSURE	02 OF 10	NA	0.72	25-90	0-1	0-1	bar	VENDOR SCOPE
17	08-PI-102B-1	PRESSURE INDICATOR	BOURDON	MIXING BLOWER-1-B FOR EQ TANK DISCHARGE PRESSURE	02 OF 10	NA	0.72	25-90	0-1	0-1	bar	VENDOR SCOPE
18	01-PI-101A	PRESSURE INDICATOR	BOURDON	MIXING BLOWER-1-A FOR SLUDGE TANK AND COLLECTION SUMP DISCHARGE PRESSURE	02 OF 10	NA	0.45	25-90	0-1	0-1	bar	VENDOR SCOPE
19	01-PI-101B	PRESSURE INDICATOR	BOURDON	MIXING BLOWER-1-B FOR SLUDGE TANK AND COLLECTION SUMP DISCHARGE PRESSURE	02 OF 10	NA	0.45	25-90	0-1	0-1	bar	VENDOR SCOPE
20	20-FSL-201-1	FLOW SWITCH	BELOW	MEMBRANE BLOWER COPROX DISCHARGE FLOW	02 OF 10	186	0.46	25-90	TBD	SP=150 L	Nm ³ /hr	1" RP
21	16-TI-401-1	TEMP INDICATOR	BI-METALIC	PROCESS AERATOR BLOWER COMMON DISCHARGE TEMP	02 OF 10	NA	0.46	25-90	0-150	0-150	Deg C	1/2" MNPT WITH TW
22	16-FI-401-1	FLOW INDICATOR	ROTAMETER	PROCESS AERATOR BLOWER COMMON DISCHARGE TEMP	02 OF 10	NA	0.46	25-90	0-500	0-500	m ³ /hr	4"
23	16-LSH-401-1	LEVEL SWITCH	TILT (2-POINT)	BIOREACTOR TANK 1 LEVEL	03 OF 10	NA	ATM	25-35	TBD	HIGH+TBD	MM	4" MS ANBI B 16.5 150 # FLANGE
24	16-AI-401-1	DO ANALYZER	DIP TYPE	BIOREACTOR TANK 1 DO	03 OF 10	NA	ATM	25-35	0-5	0-5	mg/l	2" PP ANBI B 16.5 150# FF FLANGE
25	16-FI-801-1	FLOW TRANSMITTER	ELECTROMAGNETIC	RAS TO SLODGE LINE FLOW	03 OF 10	12	0.50	25-50	0-15	0-15	m ³ /hr	4" CS ANBI B 16.5 150# FF FLANGE
26	16-PI-801A-1	PRESSURE INDICATOR	DAPHRAGM SEAL	RAS TRANSFER PUMP-1-A DISCHARGE PRESSURE	03 OF 10	NA	0.50	25-35	0-1	0-1	bar	1/2" MNPT
27	16-PI-801B-1	PRESSURE INDICATOR	DAPHRAGM SEAL	RAS TRANSFER PUMP-1-B DISCHARGE PRESSURE	03 OF 10	NA	0.50	25-35	0-1	0-1	bar	1/2" MNPT
28	20-PI-801-1	PRESSURE INDICATOR	BOURDON	VACUUM EJECTOR PRESSURE	04 OF 10	NA	NA	25-35	NA	NA	bar	VENDOR SCOPE
29	20-FI-201-1	LEVEL TRANSMITTER	HYDROSTATIC	MEMBRANE TANK 1 LEVEL	04 OF 10	NA	ATM	25-35	0-5000	0-5000	MM	SUSPENSION CLAMP 116L
30	20-PI-301-1	PRESSURE TRANSMITTER	DAPHRAGM	MEMBRANE TANK PERMEATE/BACKPULSE PUMP SUCTION PRESSURE	04 OF 10	NA	-1.10	25-35	-1.10	-1.10	bar	1/2" FIPT
31	20-PI-301A-1	PRESSURE INDICATOR	BOURDON	PERMEATE/BACKPULSE PUMP 1-A DISCHARGE PRESSURE	05 OF 10	NA	0.72	25-35	0-2.5	0-2.5	bar	1/2" MNPT
32	20-PI-301B-1	PRESSURE INDICATOR	BOURDON	PERMEATE/BACKPULSE PUMP 1-B DISCHARGE PRESSURE	05 OF 10	NA	0.72	25-35	0-2.5	0-2.5	bar	1/2" MNPT
33	20-FI-301-1	FLOW TRANSMITTER	ELECTROMAGNETIC	PERMEATE/BACKPULSE PUMP COMMON DISCHARGE FLOW	05 OF 10	56	0.72	25-35	0-70	0-70	m ³ /hr	4" CS ANBI B 16.5 150# FLANGE
34	20-AI-301-1	TURBIDITY TRANSMITTER	FLOW THROUGH	MEMBRANE TANK PERMEATE/BACKPULSE PUMP DISCHARGE TURBIDITY	05 OF 10	NA	0.72	25-35	0-5	0-5	NTU	1/2" FIPT
35	20-LS-401	LEVEL SWITCH	TILT (2-POINT)	BACKPULSE TANK LEVEL	06 OF 10	NA	ATM	25-50	TBD	HIGH+TBD/LOW+TBD	MM	4" MS ANBI B 16.5 150 # FLANGE
36	26-LS-101	LEVEL SWITCH	TILT (2-POINT)	FLOUGH TANK LEVEL	06 OF 10	NA	ATM	25-35	TBD	LOW+TBD	MM	4" MS ANBI B 16.5 150 # FLANGE



SR NO.	TAG NO.	INSTRUMENT DESCRIPTION	INSTRUMENT TYPE	SERVICE	P & ID DRAWING NO.	OPERATING		RR	RR	C BY	URP	CLIENT: IIT HYDRABAD	
						Flow (m ³ /hr)	Pressure (bar)					DATE	DOC NO
37	26-LS-102	LEVEL SWITCH	TILT (I-POINT)	FLUSH TANK-2 LEVEL	06 OF 10	NA	ATM	25-35	TBD	HIGH=TRD, LOW=TRD	MM	-	4" MS ANSI B 16.5 150# FF FLANGE
38	71-LS-901	LEVEL SWITCH LOW	MAGNETIC (I-POINT)	BRINE MEASURING TANK LEVEL	07 OF 10	NA	ATM	25-35	TBD	LOW=TRD	MM	-	2" PP ANSI B 16.5 150# FF FLANGE
39	71-PI-901A	PRESSURE INDICATOR	BOURDON	SOFTNER FEED PUMP-A DISCHARGE PRESSURE	07 OF 10	NA	3.50	25-35	0-6	0-6	bar	-	1/2" MNPT
40	71-PI-901B	PRESSURE INDICATOR	BOURDON	SOFTNER FEED PUMP-B DISCHARGE PRESSURE	07 OF 10	NA	3.50	25-35	0-6	0-6	bar	-	1/2" MNPT
41	71-PI-902A	PRESSURE INDICATOR	DIAHRAGM SEAL	SOFTNER-A FEED INLET PRESSURE	07 OF 10	NA	3.00	25-35	0-6	0-6	bar	-	1/2" MNPT
42	71-PI-901A	PRESSURE INDICATOR	DIAHRAGM SEAL	SOFTNER-A BACKWASH INLET PRESSURE	07 OF 10	NA	3.00	25-35	0-6	0-6	bar	-	1/2" MNPT
43	71-PI-902B	PRESSURE INDICATOR	DIAHRAGM SEAL	SOFTNER-B FEED INLET PRESSURE	07 OF 10	NA	3.00	25-35	0-6	0-6	bar	-	1/2" MNPT
44	71-PI-901B	PRESSURE INDICATOR	DIAHRAGM SEAL	SOFTNER-B BACKWASH INLET PRESSURE	07 OF 10	NA	3.00	25-35	0-6	0-6	bar	-	1/2" MNPT
45	71-PI-902	FLOW INDICATOR	ROTAMETER	SOFTNER - SERVICE INLET LINE FLOW	07 OF 10	NA	3.50	25-35	0-3	0-3	m ³ /hr	-	1"
46	71-PI-901	FLOW INDICATOR	ROTAMETER	SOFTNER FEED TO BRINE TANK FLOW	07 OF 10	NA	3.50	25-35	0-18	0-18	m ³ /hr	-	2 1/2"
47	23-LSL-101	LEVEL SWITCH LOW	MAGNETIC (I-POINT)	SODIUM HYPOCHLORIDE DOSING TANK LEVEL	08 OF 10	NA	ATM	25-35	TBD	LOW=TRD	MM	-	2" PP ANSI B 16.5 150# FF FLANGE
48	23-LSL-101	LEVEL SWITCH LOW	MAGNETIC (I-POINT)	CITRIC ACID DOSING TANK LEVEL	08 OF 10	NA	ATM	25-35	TBD	LOW=TRD	MM	-	2" PP ANSI B 16.5 150# FF FLANGE
49	15-LSL-001	LEVEL SWITCH LOW	MAGNETIC (I-POINT)	CAUSTIC DOSING TANK LEVEL	08 OF 10	NA	ATM	25-35	TBD	LOW=TRD	MM	-	2" PP ANSI B 16.5 150# FF FLANGE
50	23-LSL-102	LEVEL SWITCH LOW	MAGNETIC (I-POINT)	SODIUM HYPOCHLORIDE DOSING TANK LEVEL	08 OF 10	NA	ATM	25-35	TBD	HIGH=TRD, LOW=TRD	MM	-	4" MS ANSI B 16.5 150# FF FLANGE
51	80-LS-701	LEVEL SWITCH	TILT (I-POINT)	SLUDGE HOLDING TANK LEVEL	09 OF 10	NA	ATM	25-35	0-4	0-4	bar	-	1/2" MNPT
52	80-PI-701A	PRESSURE INDICATOR	DIAHRAGM SEAL	SLUDGE TRANSFER PUMP-A DISCHARGE PRESSURE	09 OF 10	NA	2.00	25-35	0-4	0-4	bar	-	1/2" MNPT
53	80-PI-701B	PRESSURE INDICATOR	DIAHRAGM SEAL	SLUDGE TRANSFER PUMP-B DISCHARGE PRESSURE	09 OF 10	NA	2.00	25-35	0-4	0-4	bar	-	1/2" MNPT
54	80-LSL-801A	LEVEL SWITCH LOW	MAGNETIC (I-POINT)	POVELECTROLYTE DOSING TANK-A LEVEL	09 OF 10	NA	ATM	25-35	TBD	TBD	MM	-	2" PP ANSI B 16.5 150# FF FLANGE
55	80-LSL-801B	LEVEL SWITCH LOW	MAGNETIC (I-POINT)	POVELECTROLYTE DOSING TANK-B LEVEL	09 OF 10	NA	ATM	25-35	TBD	TBD	MM	-	2" PP ANSI B 16.5 150# FF FLANGE
56	71-PI-904A	PRESSURE INDICATOR	DIAHRAGM SEAL	DRAIN PIT TRANSFER PUMP-A PRESSURE	09 OF 10	NA	1.50	25-35	0-4	0-4	bar	-	1/2" MNPT
57	71-PI-904B	PRESSURE INDICATOR	DIAHRAGM SEAL	DRAIN PIT TRANSFER PUMP-B PRESSURE	09 OF 10	NA	1.50	25-35	0-4	0-4	bar	-	1/2" MNPT
58	71-LS-102	LEVEL SWITCH	TILT (I-POINT)	DRAIN PIT LEVEL	09 OF 10	NA	ATM	25-35	TBD	HIGH=TRD, LOW=TRD	MM	-	4" MS ANSI B 16.5 150# FF FLANGE
59	90-PIL-101	PRESSURE SWITCH LOW	DIAHRAGM	AIR RECEIVER TANK-A PRESSURE	10 OF 10	NA	7.00	25-60	NA	NA	bar	-	VENDOR SCOPE
60	90-PI-101	PRESSURE INDICATOR	BOURDON	AIR RECEIVER TANK-A PRESSURE	10 OF 10	NA	7.00	25-60	0-16	0-16	bar	-	VENDOR SCOPE
61	90-PI-102	PRESSURE INDICATOR	BOURDON	AIR COMPRESSOR DISCHARGE HEADER PRESSURE	10 OF 10	NA	7.00	25-60	0-16	0-16	bar	-	1/2" MNPT
62	90-PIL-102	PRESSURE SWITCH LOW	DIAHRAGM	AIR COMPRESSOR DISCHARGE HEADER PRESSURE	10 OF 10	NA	7.00	25-35	0-16	0-16	5#x5 L	bar	1/2" MNPT

Note: Make and Model Number will be updated after the finalization of Supplier.

Ref Document: P&ID-0038727-AP-01 REV.A

47

MAHANKAL I SATEESH

Digitally signed by MAHANKALI SATEESH Date: 2022.10.10 19:24:08 IST



Water Technologies & Solutions

Project No.

6038727

Project

650 KLD STP -1

Customer

IIT HYDERABAD

Doc No. 6038727-PK-01

VALVE LIST

APPROVED BY
TECHNOLOGY PROVIDER



Rev.	Date	Description	Prepared	Checked	Approved
B	JULY 26, 2018	FOR APPROVAL	VK	SK	MAB
A	MAY 08, 2018	FOR SUBMISSION	VK	LP	MAB

49

MAHANKAL
I SATEESH

Digitally signed by
MAHANKALI SATEESH
Date: 2022.10.10
19:24:08 IST



Water Technologies & Solutions

VALVE LIST (BOP)

SLNO	VALVE TAG	DESCRIPTION LOCATION	SHEET NO	PIPE DIA	SIZE	QUANTY	GWT/CLIENTS PACKAGE	MANUAL/DRIFT	OPERATING CONDITION		DESIGN CONDITION		VALVE TYPE	VALVE IDENTIFICATION	VALVE GROUP	MATERIAL OF CONSTRUCTION						END CONNECTION	VALVE PRESSURE RATING	MATCHING FLANGE DRAINING STD	TYPE OF OPERATION	ACTUATOR DATA		ACTUATOR ACCESSORIES			REMARKS						
									TEMP. DEG C	PRESSURE BAR	TEMP. DEG C	PRESSURE BAR				BODY	SEAT	DISC	DIAPHRAGM/PISTON/SHAFT	BALL	STEM					ORIGINATOR	TYPE OF ACTUATOR	ACTUATOR (Bolt)	OPERENCLOSE FEEDBACK	TRAVEL STOP		SOLENOID VALVE					
1	03-HA-101-A1	EQUALIZATION TANK FEED PUMP (P3-P4) DISCHARGE	01 OF 10	UPVC	150	1	SUEZ	MANUAL	35-40	1.1	50	1.7	BUTTERFLY VALVE	BPV422	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	GEAR OPERATED	NA	NA	NA	NA	NA	NA	NA	NA	NA					
2	03-HA-101-B1	EQUALIZATION TANK FEED PUMP (P3-P4) DISCHARGE	01 OF 10	UPVC	150	1	SUEZ	MANUAL	35-40	1.1	50	1.7	BUTTERFLY VALVE	BPV422	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	GEAR OPERATED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
3	03-CV-101-A1	EQUALIZATION TANK FEED PUMP (P3-P4) DISCHARGE	01 OF 10	UPVC	150	1	SUEZ	MANUAL	35-40	1.1	50	1.7	CHECK VALVE	CV422	CHECK VALVE	SS316	SS316	SS316	SS316	WAFER	150#	ANSI B 16.5, RF, 150#	SINGLE PLATE SWING	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
4	03-CV-101-B1	EQUALIZATION TANK FEED PUMP (P3-P4) DISCHARGE	01 OF 10	UPVC	150	1	SUEZ	MANUAL	35-40	1.1	50	1.7	CHECK VALVE	CV422	CHECK VALVE	SS316	SS316	SS316	SS316	WAFER	150#	ANSI B 16.5, RF, 150#	SINGLE PLATE SWING	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
5	03-HA-102-A1	EQUALIZATION TANK FEED PUMPS (P3-P4) RECIRCULATION	01 OF 10	UPVC	100	1	SUEZ	MANUAL	35-40	1.1	50	1.7	BUTTERFLY VALVE	BPV411	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
6	03-HA-102-B1	EQUALIZATION TANK FEED PUMPS (P3-P4) RECIRCULATION	01 OF 10	UPVC	100	1	SUEZ	MANUAL	35-40	1.1	50	1.7	BUTTERFLY VALVE	BPV424	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	LUGGED	PN10	ANSI B 16.5, RF, 150#	GEAR OPERATED HAND WHEEL EXTENDED SPINDLE SHAFT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	SPINDLE LENGTH = 900MM		
7	03-HA-102-A1	BIOREACTOR FEED PUMP (P3-P4) DISCHARGE	01 OF 10	UPVC	80	1	SUEZ	MANUAL	35-40	1.15	50	1.7	BUTTERFLY VALVE	BPV411	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
8	03-HA-102-B1	BIOREACTOR FEED PUMP (P3-P4) DISCHARGE	01 OF 10	UPVC	80	1	SUEZ	MANUAL	35-40	1.15	50	1.7	BUTTERFLY VALVE	BPV411	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
9	03-HA-103-A1	BIOREACTOR FEED PUMP (P3-P4) RECIRCULATION	01 OF 10	UPVC	60	1	SUEZ	MANUAL	35-40	1.15	50	1.7	BUTTERFLY VALVE	BPV411	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
10	03-HA-103-B1	BIOREACTOR FEED PUMP (P3-P4) RECIRCULATION	01 OF 10	UPVC	60	1	SUEZ	MANUAL	35-40	1.15	50	1.7	CHECK VALVE	CV422	CHECK VALVE	SS316	SS316	SS316	SS316	WAFER	150#	ANSI B 16.5, RF, 150#	SINGLE PLATE SWING	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	03-HA-104-A1	AIR FROM MIXING BLOWERS (P3-P4) DISCHARGE	01 OF 10	GI	25	8	SUEZ	MANUAL	90	0.72	100	1.1	BALL VALVE	BV414	BALL VALVE	CFRM	CFRM	CFRM	CFRM	BSPP	600#	NA	MANUAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
12	03-HA-104-B1	AIR FROM MIXING BLOWERS (P3-P4) DISCHARGE	01 OF 10	GI	25	10	SUEZ	MANUAL	110	0.72	120	1.1	BALL VALVE	BV414	BALL VALVE	CFRM	CFRM	CFRM	CFRM	BSPP	600#	NA	MANUAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
13	03-HA-105-A1	PROCESS BLOWER (P3-P4) DISCHARGE	2 OF 10	GI	15	1	SUEZ	MANUAL	95	0.55	110	0.8	BALL VALVE	BV414	BALL VALVE	CFRM	CFRM	CFRM	CFRM	BSPP	600#	NA	MANUAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
14	03-HA-105-B1	PROCESS BLOWER (P3-P4) DISCHARGE	2 OF 10	GI	15	1	SUEZ	MANUAL	95	0.55	110	0.8	BALL VALVE	BV414	BALL VALVE	CFRM	CFRM	CFRM	CFRM	BSPP	600#	NA	MANUAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	03-HA-106-A1	PROCESS BLOWER (P3-P4) DISCHARGE	2 OF 10	GI	100	1	SUEZ	MANUAL	95	0.55	110	0.8	BUTTERFLY VALVE	BPV411	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
16	03-HA-106-B1	PROCESS BLOWER (P3-P4) DISCHARGE	2 OF 10	GI	100	1	SUEZ	MANUAL	95	0.55	110	0.8	BUTTERFLY VALVE	BPV411	BUTTERFLY	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	NYLON COATED DUCTILE IRON	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	03-HA-107-A1	MEMBRANE BLOWER (P3-P4) DISCHARGE	2 OF 10	GI	15	1	SUEZ	MANUAL	85	0.46	100	0.7	BALL VALVE	BV414	BALL VALVE	CFRM	CFRM	CFRM	CFRM	BSPP	600#	NA	MANUAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:24:08 IST



Water Technologies & Solutions

VALVE LIST (BOP)

SLNO	VALVE TAG	DESCRIPTION LOCATION	SHEET NO	PNS MOC	SIZE (MM)	QUANTY (NO)	GRVTY/ CURVY/ DRN/ PKGAGE	MANUAL/ ON/OFF	OPERATING CONDITON	DESIGN CONDITON	VALVE TYPE	VALVE IDENTIFICATIO N	VALVE GROUP	MATERIAL OF CONSTRUCTION				MATCHING FLANGING STD	TYPE OF OPERATION	ACTUATOR DATA		ACTUATOR ACCESSORIES		REMARKS						
														TEMP. DEGR. (C)	TEMP. REBAR DEGR. (BAR)	PRESSURE (G)	SEAT			DISC	DIAPHRAGM/ PHLEGSHEAF/ J/SPRING	END CONNECTION	VALVE PRESSURE RATING		PHREMATI C ELECTRICAL (P/OF/ L)	TYPE OF ACTU. ELECTRICAL (P/OF/ L)	ACTU. PR (BAR)	OPENCLOSE FEEDBACK	TRAVEL STOP	SOLENOID VALVE
38	16HV-005-1	RAS TRANSFER PUMP (FOR SLUDGE HOLDING TANK)	3 OF 10	CS	50	1	SIEZ	MANUAL	35-40	0.8	50	1.2	BUTTERLY VALVE	BPV-L1	BUTTERLY VALVE	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	WAFER	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NIL			
39	16CV-001A-1	RAS TRANSFER PUMP (P-01A) DISCHARGE	3 OF 10	CS	150	1	SIEZ	MANUAL	35-40	0.8	50	1.2	CHECK VALVE	CV-S2	CHECK VALVE	SS316	SS316	WAFER	ANSI B 16.5, RF, 150#	SINGLE PLATE SWING	NA	NA	NA	NA	NA	NA	NIL			
40	16CV-001B-1	RAS TRANSFER PUMP (P-01B-1) DISCHARGE	3 OF 10	CS	150	1	SIEZ	MANUAL	35-40	0.8	50	1.2	CHECK VALVE	CV-S2	CHECK VALVE	SS316	SS316	WAFER	ANSI B 16.5, RF, 150#	SINGLE PLATE SWING	NA	NA	NA	NA	NA	NA	NA	NIL		
41	16HV-004-1	RAS TRANSFER PUMP RECIRCULATION	3 OF 10	CS	150	1	SIEZ	MANUAL	35-40	0.8	50	1.2	BUTTERLY VALVE	BPV-G2	BUTTERLY VALVE	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	WAFER	ANSI B 16.5, RF, 150#	GEAR OPERATED	NA	NA	NA	NA	NA	NA	NIL		
42	16HV-006A-1	RAS TRANSFER PUMP (P-01A) DISCHARGE	3 OF 10	CS	25	1	SIEZ	MANUAL	35-40	3	50	4.5	BALL VALVE	BV-L1	BALL VALVE	CFR	CFR	SOCKET	N/A	MANUAL	NA	NA	NA	NA	NA	NA	NA	NIL		
43	16HV-006B-1	RAS TRANSFER PUMP (P-01B-1) DISCHARGE	3 OF 10	CS	25	1	SIEZ	MANUAL	35-40	3	50	4.5	BALL VALVE	BV-L2	BALL VALVE	CFR	CFR	SOCKET	N/A	MANUAL	NA	NA	NA	NA	NA	NA	NA	NIL		
44	16HV-005-1	AIR FROM PROCESS TO INUBREACTOR TANK	03 OF 10	CI	25	14	SIEZ	MANUAL	50	0.72	100	1.1	BALL VALVE	BV-L4	BALL VALVE	CFRM	CFRM	SOCKET	NA	MANUAL	NA	NA	NA	NA	NA	NA	NA	NIL		
45	20FP-001-1	PERMATEX PUMP (P-01) SUCTION HEADER	5 OF 10	SS316	100	1	SIEZ	AUTO	35-40	0.8	90	1.2	BUTTERLY VALVE	BPV-D1	BUTTERLY VALVE	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	WAFER	ANSI B 16.5, RF, 150#	DOUBLE ACTING MCC ALUMINIUM BODY WITH OPEN 4.52 WAY MANIFOLD	NA	5.5	NA	NA	NA	NA	NA	NIL	
46	20FP-002-1	BACKWASH PUMP (P-01) SUCTION HEADER	5 OF 10	SS316	150	1	SIEZ	AUTO	35-40	0.8	90	1.2	BUTTERLY VALVE	BPV-D1	BUTTERLY VALVE	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	WAFER	ANSI B 16.5, RF, 150#	DOUBLE ACTING MCC ALUMINIUM BODY WITH OPEN 4.52 WAY MANIFOLD	NA	5.5	NA	NA	NA	NA	NA	NA	NIL
47	20FP-003-1	PERMATEX PUMP (P-01) SUCTION HEADER	5 OF 10	SS316	100	1	SIEZ	AUTO	35-40	0.8	90	1.2	BUTTERLY VALVE	BPV-D1	BUTTERLY VALVE	EPDM	NYLON COATED DUCTILE IRON	STEM SS316	WAFER	ANSI B 16.5, RF, 150#	DOUBLE ACTING MCC ALUMINIUM BODY WITH OPEN 4.52 WAY MANIFOLD	NA	5.5	NA	NA	NA	NA	NA	NA	NIL

MAHANKALI SATEESH
 Digitally signed by MAHANKALI SATEESH
 Date: 2022.10.10 19:24:08 IST



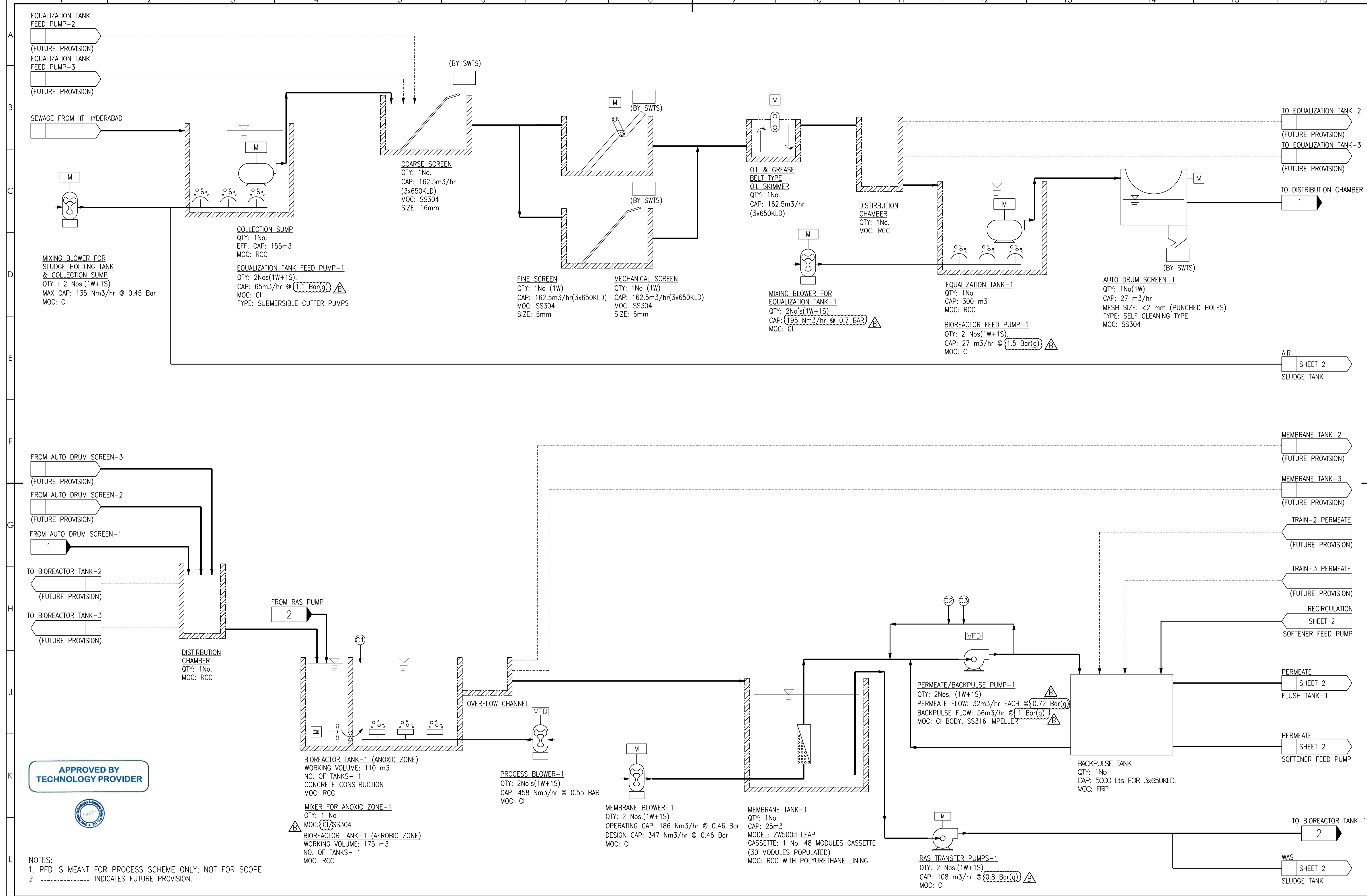
Water Technologies & Solutions

VALVE LIST (BOP)

SLNO	VALVE TAG	DESCRIPTION LOCATION	SHEET NO	PIPE SIZE	QTY	CLIENT/DR PACKAGE	MANUAL/OFF	OPERATING CONDITION			DESIGN CONDITION			MATERIAL OF CONSTRUCTION						VALVE END CONNECTION	VALVE PRESSURE RATING	ACTUATOR FLANGING/STANDARD	TYPE OF OPERATION	PREMIUM ELECTRICAL	TYPE OF ACTUATOR	ACTUATOR DATA	ACTUATOR ACCESSORIES			REMARKS			
								TEMP. DEG.C	TEMP. DEG.C	PRESSURE (PSI)	TEMP. DEG.C	TEMP. DEG.C	PRESSURE (BAR)	SEAT	DISC	EMPIGATOR/SPRING	BALL	VALVE TYPE	INDUSTRIAL								VALVE GROUP	BODY	STEM		VALVE	END CONNECTION	TRAVEL STOP
57	22-FV-01	GTRIC ACID DRAINING BACKFLOW DISCHARGE HEADER	5 OF 10	CPVC 15	1	SUEZ	AUTO	35-40	2	50	6	BALL VALVE	BV-D42	BALL VALVE	CPVC	PTFE	NA	STEM CPVC	CPVC	SOCKET	SCH80, 250 PSI	DOUBLE ACTING MDC ALUMINUM BODY WITH OPERATOR ENCLOSED 5/2 WAY MANIFOLD	PREMIUM C	NA	5.5	2-WIRE 24VDC PROXIMITY SWITCH WITH ELECTRICAL CONNECTION 1/2" NPT PLUS	NA	TRAVEL STOP	OPEN/SHUT OFF	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE	
58	22-FV-01	SODIUM HYPOCHLORITE DOSING TO BACKFLOW DISCHARGE HEADER	5 OF 10	CPVC 15	1	SUEZ	AUTO	35-40	2	50	6	BALL VALVE	BV-D42	BALL VALVE	CPVC	PTFE	NA	STEM CPVC	CPVC	SOCKET	SCH80, 250 PSI	DOUBLE ACTING MDC ALUMINUM BODY WITH OPERATOR ENCLOSED 5/2 WAY MANIFOLD	PREMIUM C	NA	5.5	2-WIRE 24VDC PROXIMITY SWITCH WITH ELECTRICAL CONNECTION 1/2" NPT PLUS	NA	TRAVEL STOP	OPEN/SHUT OFF	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE	
59	22-CV-02	GTRIC ACID DRAINING TO BACKFLOW DISCHARGE HEADER	1 OF 10	CPVC 15	1	SUEZ	MANUAL	35-40	2	50	6	CHECK VALVE	CV-42	CHECK VALVE	CPVC	PTFE	NA	NA	CPVC	SOCKET	SCH80, 250 PSI	BALL CHECK	NA	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
60	22-CV-12	600ML HYPOCHLORITE DOSING TO BACKFLOW DISCHARGE HEADER	5 OF 10	CPVC 15	1	SUEZ	MANUAL	35-40	2	50	6	CHECK VALVE	CV-42	CHECK VALVE	CPVC	PTFE	NA	NA	CPVC	SOCKET	SCH80, 250 PSI	BALL CHECK	NA	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
61	20-AV-02	BACKFLOW WATER TO BACKFLOW PUMP-1	6 OF 10	SS316 150	1	SUEZ	MANUAL	35-40	ATM	50	1	BUTTERFLY VALVE	BFV-42	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	GEAR OPERATED	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
62	74-AV-01	PERMATE TO SOFTNER FEED PUMP	6 OF 10	PVC 80	1	SUEZ	MANUAL	35-40	ATM	50	1	BUTTERFLY VALVE	BFV-41	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
63	20-AV-01	BACKFLOW TANK 500-LITRE (50) DRAIN	6 OF 10	PVC 50	1	SUEZ	MANUAL	35-40	ATM	50	1	BUTTERFLY VALVE	BFV-45	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	LUGGED	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
64	20-AV-08	SERVICE WATER TO BACKFLOW TANK	6 OF 10	PVC 50	1	SUEZ	MANUAL	35-40	5	50	7	BUTTERFLY VALVE	BFV-41	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
65	20-AV-09	SERVICE WATER TO BRINE MEASURING TANK	7 OF 10	UPVC 25	1	SUEZ	MANUAL	35-40	5	50	7	BALL VALVE	BV-42	BALL VALVE	UPVC	PTFE	NA	STEM UPVC	UPVC	SOCKET	SCH80, 200 PSI	MANUAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		BRINE MEASURING TANK DRAIN	7 OF 10	UPVC 25	1	SUEZ	MANUAL	35-40	1	50	2	BALL VALVE	BV-42	BALL VALVE	UPVC	PTFE	NA	STEM UPVC	UPVC	SOCKET	SCH80, 200 PSI	MANUAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		SOFTNER FEED PUMP-A SECTION	7 OF 10	PVC 80	1	SUEZ	MANUAL	35-40	1	50	1.5	BUTTERFLY VALVE	BFV-41	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		SOFTNER FEED PUMP-B SECTION	7 OF 10	PVC 80	1	SUEZ	MANUAL	35-40	1	50	1.5	BUTTERFLY VALVE	BFV-41	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		SOFTNER FEED PUMP-A DISCHARGE	7 OF 10	PVC 50	1	SUEZ	MANUAL	35-40	3.5	50	5.25	BUTTERFLY VALVE	BFV-41	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		SOFTNER FEED PUMP-B DISCHARGE	7 OF 10	PVC 50	1	SUEZ	MANUAL	35-40	3.5	50	5.25	BUTTERFLY VALVE	BFV-41	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		SOFTNER FEED PUMP REGENERATION	7 OF 10	PVC 50	1	SUEZ	MANUAL	35-40	3.5	50	5.25	BUTTERFLY VALVE	BFV-41	BUTTERFLY VALVE	EPDM	EPDM	NYLON COATED DUCTILE IRON	STEM SS416	NA	WAFER	PN10	ANSI B 16.5, RF, 150#	HAND LEVER	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		SOFTNER FEED PUMP-A DISCHARGE	7 OF 10	PVC 50	1	SUEZ	MANUAL	35-40	3.5	50	5.25	CHECK VALVE	CV-42	CHECK VALVE	BRUNNEN	BRUNNEN	SS316	NA	WAFER	100#	ANSI B 16.5, RF, 150#	SINGLE PLATE SWING	NA	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE
		SOFTNER FEED PUMP-B DISCHARGE	7 OF 10	PVC 50	1	SUEZ	MANUAL	35-40	3.5	50	5.25	CHECK VALVE	CV-42	CHECK VALVE	BRUNNEN	BRUNNEN	SS316	NA	WAFER	100#	ANSI B 16.5, RF, 150#	SINGLE PLATE SWING	NA	NA	NA	NA	NA	NA	NA	NA	NA	SOLENOID VALVE	ASTM A132 CHROME PLATED BRASS VALVE BODY AND TRIM 316L SS PIECE

MAHANKAL I SATEESH

Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:24:08 IST



APPROVED BY TECHNOLOGY PROVIDER



NOTES:
 1. PFD IS MEANT FOR PROCESS SCHEME ONLY; NOT FOR SCOPE.
 2. ----- INDICATES FUTURE PROVISION.

REV	DESCRIPTION	ECO	DWN	APPR	DATE
B	REVISED PER CLIENT COMMENTS			KJ KR SK	26 Jul 18
A	INITIAL RELEASE			KJ RS BMA	25 Jul 18

TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.x	FRAC
.xx	

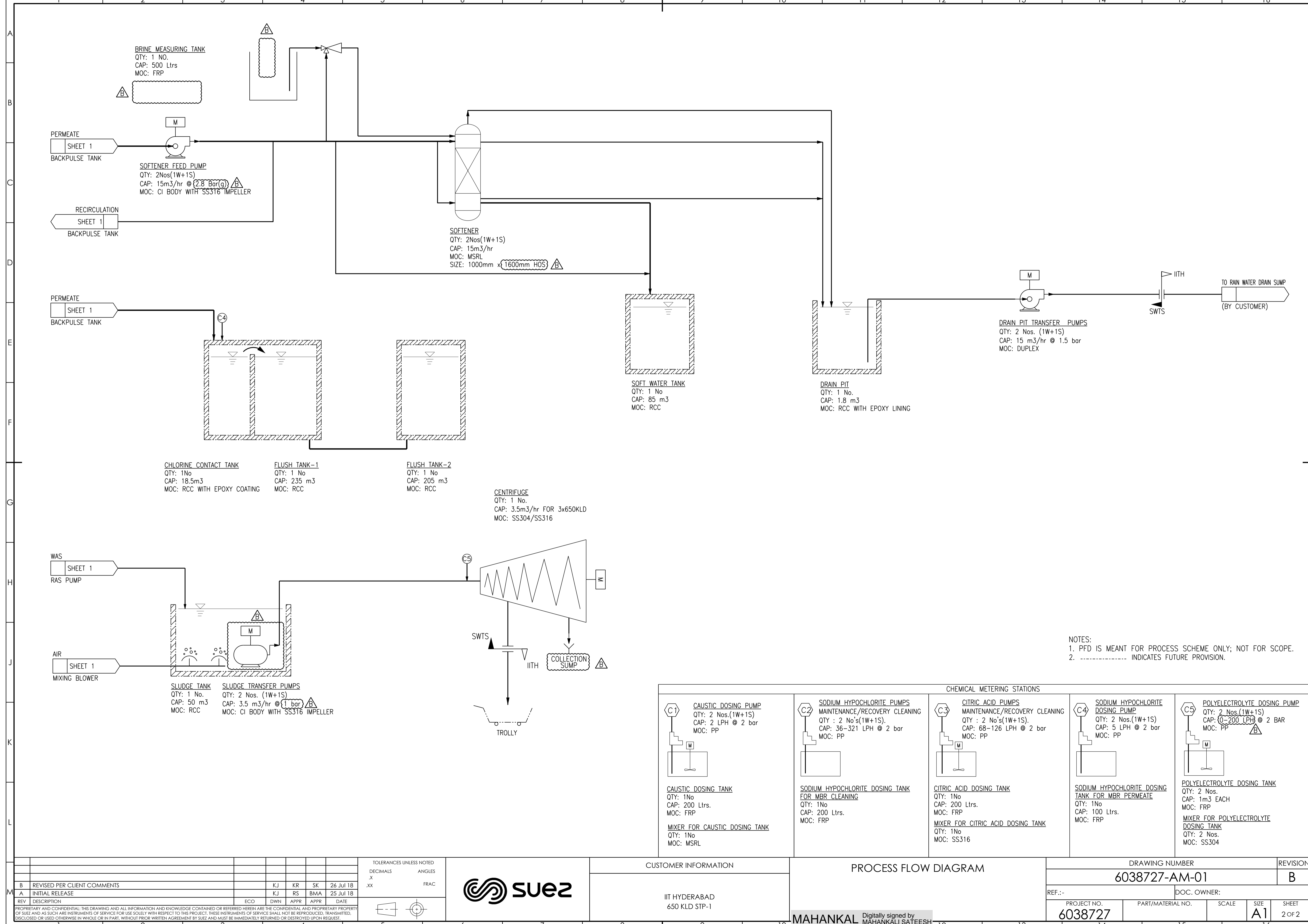


CUSTOMER INFORMATION
IIT HYDERABAD 650 KLD STP-1

PROCESS FLOW DIAGRAM
MAHANKALI SATEESH Digitally signed by MAHANKALI SATEESH Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER		REVISION
6038727-AM-01		B
PROJECT NO. 6038727	PART/MATERIAL NO.	SCALE
		SIZE A1
		SHEET 1 OF 2

FILE LOCATION: C:\Users\32625527\appdata\local\temp\Temp\Kcrubsh_46f6\6038727-AM-01.dwg



BRINE MEASURING TANK
 QTY: 1 No.
 CAP: 500 Ltrs
 MOC: FRP

SOFTENER FEED PUMP
 QTY: 2Nos(1W+1S)
 CAP: 15m³/hr @ 2.8 Bar(g)
 MOC: CI BODY WITH SS316 IMPELLER

SOFTENER
 QTY: 2Nos(1W+1S)
 CAP: 15m³/hr
 MOC: MSRL
 SIZE: 1000mm x 1600mm HOS

SOFT WATER TANK
 QTY: 1 No
 CAP: 85 m³
 MOC: RCC

DRAIN PIT TRANSFER PUMPS
 QTY: 2 Nos. (1W+1S)
 CAP: 15 m³/hr @ 1.5 bar
 MOC: DUPLEX

CHLORINE CONTACT TANK
 QTY: 1No
 CAP: 18.5m³
 MOC: RCC WITH EPOXY COATING

FLUSH TANK-1
 QTY: 1 No
 CAP: 235 m³
 MOC: RCC

FLUSH TANK-2
 QTY: 1 No
 CAP: 205 m³
 MOC: RCC

CENTRIFUGE
 QTY: 1 No.
 CAP: 3.5m³/hr FOR 3x650KLD
 MOC: SS304/SS316

SLUDGE TANK
 QTY: 1 No.
 CAP: 50 m³
 MOC: RCC

SLUDGE TRANSFER PUMPS
 QTY: 2 Nos. (1W+1S)
 CAP: 3.5 m³/hr @ 1 bar
 MOC: CI BODY WITH SS316 IMPELLER

CAUSTIC DOSING PUMP
 QTY: 2 Nos.(1W+1S)
 CAP: 2 LPH @ 2 bar
 MOC: PP

CAUSTIC DOSING TANK
 QTY: 1No
 CAP: 200 Ltrs.
 MOC: FRP

MIXER FOR CAUSTIC DOSING TANK
 QTY: 1No
 MOC: MSRL

SODIUM HYPOCHLORITE PUMPS
 MAINTENANCE/RECOVERY CLEANING
 QTY : 2 No's(1W+1S).
 CAP: 36-321 LPH @ 2 bar
 MOC: PP

SODIUM HYPOCHLORITE DOSING TANK FOR MBR CLEANING
 QTY: 1No
 CAP: 200 Ltrs.
 MOC: FRP

MOC: FRP

CITRIC ACID PUMPS
 MAINTENANCE/RECOVERY CLEANING
 QTY : 2 No's(1W+1S).
 CAP: 68-126 LPH @ 2 bar
 MOC: PP

CITRIC ACID DOSING TANK
 QTY: 1No
 CAP: 200 Ltrs.
 MOC: FRP

MIXER FOR CITRIC ACID DOSING TANK
 QTY: 1No
 MOC: SS316

SODIUM HYPOCHLORITE DOSING PUMP
 QTY: 2 Nos.(1W+1S)
 CAP: 5 LPH @ 2 bar
 MOC: PP

SODIUM HYPOCHLORITE DOSING TANK FOR MBR PERMEATE
 QTY: 1No
 CAP: 100 Ltrs.
 MOC: FRP

MOC: FRP

POLYELECTROLYTE DOSING PUMP
 QTY: 2 Nos.(1W+1S)
 CAP: 0-200 LPH @ 2 BAR
 MOC: PP

POLYELECTROLYTE DOSING TANK
 QTY: 2 Nos.
 CAP: 1m³ EACH
 MOC: FRP

MIXER FOR POLYELECTROLYTE DOSING TANK
 QTY: 2 Nos.
 MOC: SS304

NOTES:
 1. PFD IS MEANT FOR PROCESS SCHEME ONLY; NOT FOR SCOPE.
 2. ----- INDICATES FUTURE PROVISION.

REV	DESCRIPTION	ECO	DWN	APPR	APPR	DATE
B	REVISED PER CLIENT COMMENTS			KJ	KR	26 Jul 18
A	INITIAL RELEASE			KJ	RS	25 Jul 18

TOLERANCES UNLESS NOTED
DECIMALS .x
ANGLES
FRAC .xx



CUSTOMER INFORMATION
 IIT HYDERABAD
 650 KLD STP-1

PROCESS FLOW DIAGRAM

DRAWING NUMBER		REVISION	
6038727-AM-01		B	
PROJECT NO.	PART/MATERIAL NO.	SCALE	SHEET
6038727			A1 2 OF 2

MAHANKALI SATEESH
 Digitally signed by MAHANKALI SATEESH
 Date: 2022.10.10 19:25:16 IST

PIPING & INSTRUMENT DIAGRAM

IIT HYDERABAD

650 KLD STP-1



Suez

Water Technologies and Solutions

APPROVED BY
TECHNOLOGY PROVIDER



Suez Water Technologies and Solutions	
DRAWING ISSUED FOR	
<input type="checkbox"/> INFORMATION	<input type="checkbox"/> REFERENCE
<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> TENDER
<input type="checkbox"/> MANUFACTURING	<input type="checkbox"/> PROCUREMENT
<input checked="" type="checkbox"/> APPROVAL	<input type="checkbox"/> AS BUILT
SIGNATURE	DATE
	25.JUL.18

REV	DESCRIPTION	ECO	DWN	APPR	APPR	DATE
B	REVISED PER CLIENT COMMENTS			KJ	KR	26 Jul 18
A	INITIAL RELEASE			KJ	KR	24 Jul 18

TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.X	FRAC
.XX	



CUSTOMER INFORMATION
IIT HYDERABAD 650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM
COVER SHEET

DRAWING NUMBER		REVISION	
6038727-AA-01		B	
PROJECT NO.	PART/MATERIAL NO.	SCALE	SHEET
6038727			1 OF 1

MAHANKALI SATEESH
Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:25:16 IST

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CONTROL VALVE ACTUATORS	VALVE SYMBOLS (VALVES NORMALLY OPEN EXCEPT WHEN SHADED)	RELIEF	PUMPS, BLOWERS, & COMPRESSORS	FLOW ELEMENT	CONNECTIONS	FILTERS	VESSLS/TRIM	MISCELLANEOUS	SCOPE BREAK						
PISTON DOUBLE ACTING PISTON SPRING TO OPEN PISTON SPRING TO CLOSE DIAPHRAGM DOUBLE ACTING DIAPHRAGM SPRING TO OPEN DIAPHRAGM SPRING TO CLOSE DIAPHRAGM DOUBLE BALANCING BACK PRESSURE CONTROL (EXTERNAL REGULATING) BACK PRESSURE CONTROL (INTERNAL REGULATING) PRESSURE REDUCING (EXTERNAL REGULATING) PRESSURE REDUCING (INTERNAL REGULATING) ROTARY MOTOR ANALOG ROTARY MOTOR DIGITAL I/P CONVERTER POSITIONER TRAVEL STOP MANUAL GEAR WHEEL MANUAL CHAIN WHEEL SOLENOID SOLENOID 3 WAY SOLENOID 4 WAY	GATE (OR GENERIC) BALL BUTTERFLY NEEDLE GLOBE DIAPHRAGM ANGLE PLUG PINCH V-BALL KNIFE GATE UPWARD OPENING SLIDING GATE DOWNWARD OPENING SLIDING GATE MANUAL BLAST GATE BACKFLOW PREVENTER CHECK INJECTION QUILL FOOT FLOAT MUD 3 WAY 4 WAY 5 WAY 6 WAY 2 VALVE MANIFOLD 3 VALVE MANIFOLD 5 VALVE MANIFOLD SAMPLE	PRESSURE SAFETY VACUUM SAFETY MULTIFUNCTION PRESSURE RUPTURE DIGB VACUUM RUPTURE DIGB AIR RELEASE VACUUM BREAKER VENT VENT GROUND DRAIN	CENTRIFUGAL PUMP CENTRIFUGAL/REGENERATIVE BLOWER PROPELLER PUMP ROTARY LOBE COMPRESSOR BLOWER METERING PUMP VACUUM PUMP (DRY) AIR OPERATED DOUBLE DIAPHRAGM PUMP VACUUM PUMP LIQUID RING POSITIVE DISPLACEMENT PUMP AIR COMPRESSOR PISTON AIR COMPRESSOR ROTARY SCREW REFRIGERATED AIR DRYER FAN ERI PRESSURE EXCHANGER DRUM PUMP SUBMERSIBLE SUMP PUMP HYDRAULIC PRESSURE BOOSTER	PADDLE WHEEL ANNUBAR FLOW NOZZLE FLUME MAGNETIC PITOT SONIC/ULTRASONIC TURBINE VENTURI TUBE VORTEX ROTAMETER IN-LINE FLOW GLASS FLOW STRAIGHTENER FIXED ORIFICE ADJUSTABLE ORIFICE RESTRICTED ORIFICE RESTRICTED ORIFICE ANGLE ORIFICE PLATE QUICK-CHANGE	FLANGE FLANGE BLIND MECHANICAL COUPLING OR VICTAULIC MECHANICAL COUPLING OR VICTAULIC PLUG SANITARY SANITARY PLUG THREADED THREADED PLUG SOCKET UNION CAMLOCK CAMLOCK PLUG HOSE BARB WELDED PIPE CAP PLAIN END PIPE COUPLING REDUCER COMPRESSION FITTING COMPRESSION FITTING PLUG SPECTACLE BLIND OPEN SPECTACLE BLIND CLOSED HEATING TANK HEATER HEAT EXCHANGER IN-LINE HEATER PLATE & FRAME HEAT EXCHANGER DESUPERHEATER	MANUAL SCREEN MECHANICAL SCREEN OIL & GREASE BELT TYPE OIL SKIMMER HEPA FILTER Y STRAINER CONICAL STRAINER FILTER PUMP SCREEN STEAM TRAP MEDIA TRAP RESIN TRAP UF/SCREEN MEMBRANE MODULE AUTO DRUM SCREEN	CONICAL BOTTOM TANK PROPELLER AGITATOR VORTEX BREAKER VESSEL INSULATION LEVEL GLASS ELLIPTICAL MANWAY MANHOLE MANHOLE W/ DAVIT ARM VESSEL SIGHT GLASS WATER LEVEL LADDER/PLATFORM	MUFFLER EDUCTOR STATIC MIXER EXPANSION JOINT SILENCER VIBRATION ISOLATOR HIGH PRESSURE FLEXIBLE CONNECTOR INJECTION SPARGER DIAPHRAGM SEAL/GAGE GUARD PULSATION DAMPENER SPRAYER NOZZLE DESICCANT AIR DRYER HYDROMETER POT COARSE BUBBLE DIFFUSER ELEVATION VIEW FINE BUBBLE DIFFUSER ELEVATION VIEW THERMOWELL TOP MOUNT LEVEL SWITCH ULTRASONIC LEVEL CALIBRATION COLUMN PIG TAIL ION EXCHANGE BOTTLE	IITH SWTS MATERIAL BREAK MATERIAL A MATERIAL B PIPE INSULATION/DOUBLE CONTAINMENT PP 2" ("PP" INDICATES PERSONNEL PROTECTION -OPTIONAL) LINE TYPES PRIMARY PROCESS SECONDARY PROCESS SAMPLE/DRAINS/VENTS/ETC FICTITIOUS LINE PRIMARY PROCESS (BY OTHERS) SECONDARY PROCESS (BY OTHERS) FUTURE EQUIPMENT LIMIT OR BOUNDARY LINE EQUIPMENT EQUIPMENT (BY OTHERS) FLEX HOSE/TUBING SOFTWARE-LINK ELECTRICAL ELECTROMAGNETIC OR SONIC SIGNAL (WIRELESS) PNEUMATIC HYDRAULIC SIGNAL CAPILLARY TUBING HEAT-TRACING STEAM-TRACE ELECTRICAL-TRACE MISCELLANEOUS LINE OBJECTS SLOPE CONTINUATION SYMBOL CROSSOVER LINE REVISION CLOUD REVISION TRIANGLE						

B		REVISD PER CLIENT COMMENTS	KJ	KR	SK	26 Jul 18
A		INITIAL RELEASE	KJ	KR	SK	24 Jul 18
REV	DESCRIPTION	ECO	DWN	APPR	APPR	DATE
<small>PROPRIETARY AND CONFIDENTIAL: THIS DRAWING AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HEREIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.</small>						

TOLERANCES UNLESS NOTED
DECIMALS .x
ANGLES
FRAC .xx



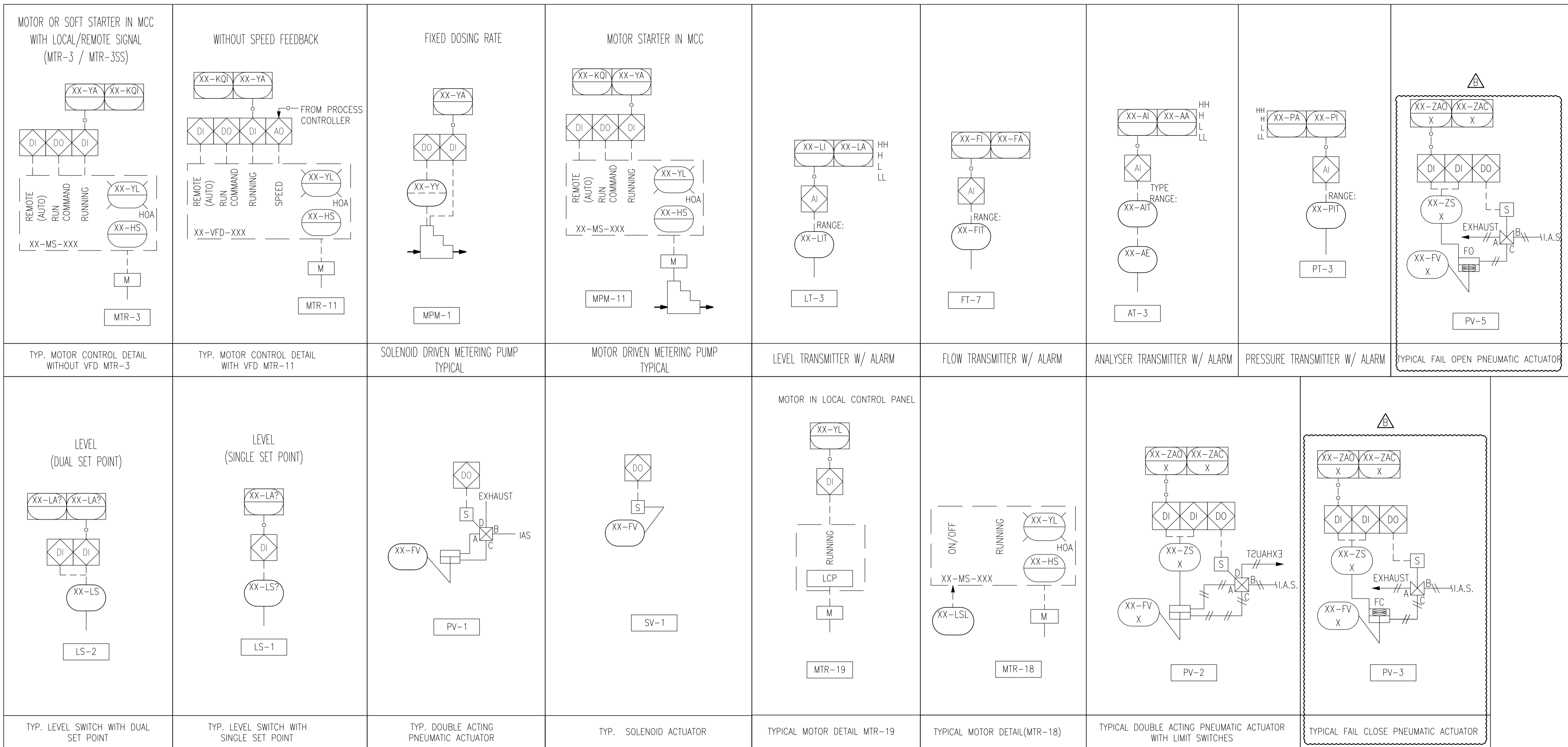
CUSTOMER INFORMATION
IIT HYDERABAD 650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM
LEGEND & SYMBOLS

DRAWING NUMBER					REVISION
6038727-AA-02					B
REF.:-		DOC. OWNER:			
PROJECT NO.	PART/MATERIAL NO.	SCALE	SIZE	SHEET	
6038727			A1	1 OF 3	

MAHANKALI SATEESH
Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:25:16 IST

FILE LOCATION: C:\Users\30525527\appdata\local\temp\Temp\Kcr\ubsh_468\6038727-AA-02.dwg



PROCESS AREA CLASSIFICATION	
03	INFLUENT COLLECTION, PUMPING & TRANSFER
08	PRETREATMENT SYSTEM
15	BIOTREATMENT CHEMICALS
16	BIOLOGICAL SYSTEM
20	MBR SYSTEM
23	MBR CLEANING CHEMICALS
71	SOFTENER
80	SLUDGE HANDLING SYSTEM
90	COMPRESSED AIR SYSTEM
92	SERVICE WATER SYSTEM

TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.x	FRAC
.xx	

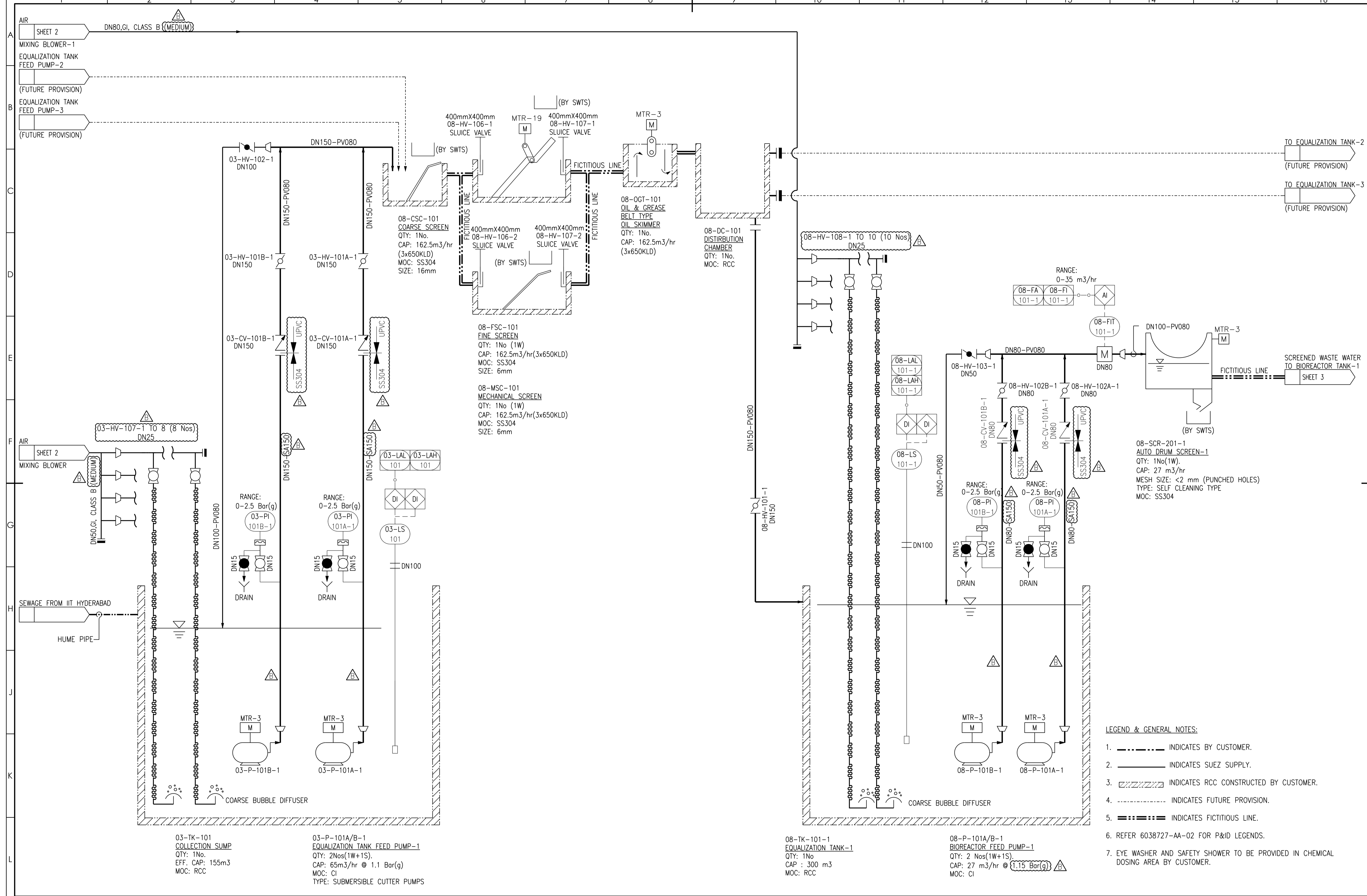


CUSTOMER INFORMATION
IIT HYDERABAD
650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM

MAHANKALI SATEESH
Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER					REVISION
6038727-AA-02					B
REF.:-	DOC. OWNER:				
PROJECT NO.	PART/MATERIAL NO.	SCALE	SIZE	SHEET	
6038727			A1	3 OF 3	



- LEGEND & GENERAL NOTES:**
- INDICATES BY CUSTOMER.
 - INDICATES SUEZ SUPPLY.
 - ▨ INDICATES RCC CONSTRUCTED BY CUSTOMER.
 - INDICATES FUTURE PROVISION.
 - INDICATES FICTITIOUS LINE.
 - REFER 6038727-AA-02 FOR P&ID LEGENDS.
 - EYE WASHER AND SAFETY SHOWER TO BE PROVIDED IN CHEMICAL DOSING AREA BY CUSTOMER.

REV	DESCRIPTION	ECO	DWN	APPR	DATE
B	REVISED PER CLIENT COMMENTS			KJ KR SK	26 Jul 18
A	INITIAL RELEASE			KJ KR SK	17 Jul 18

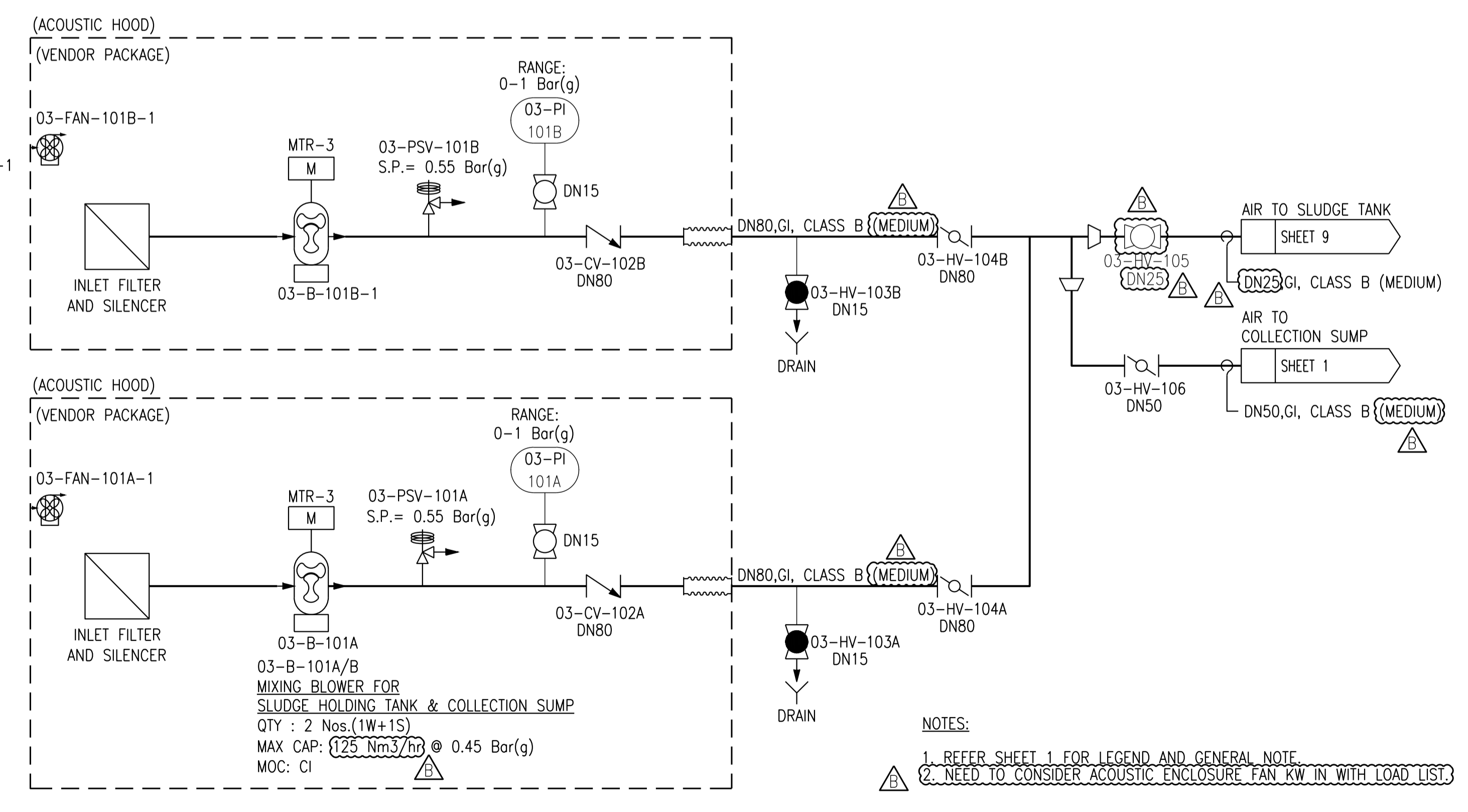
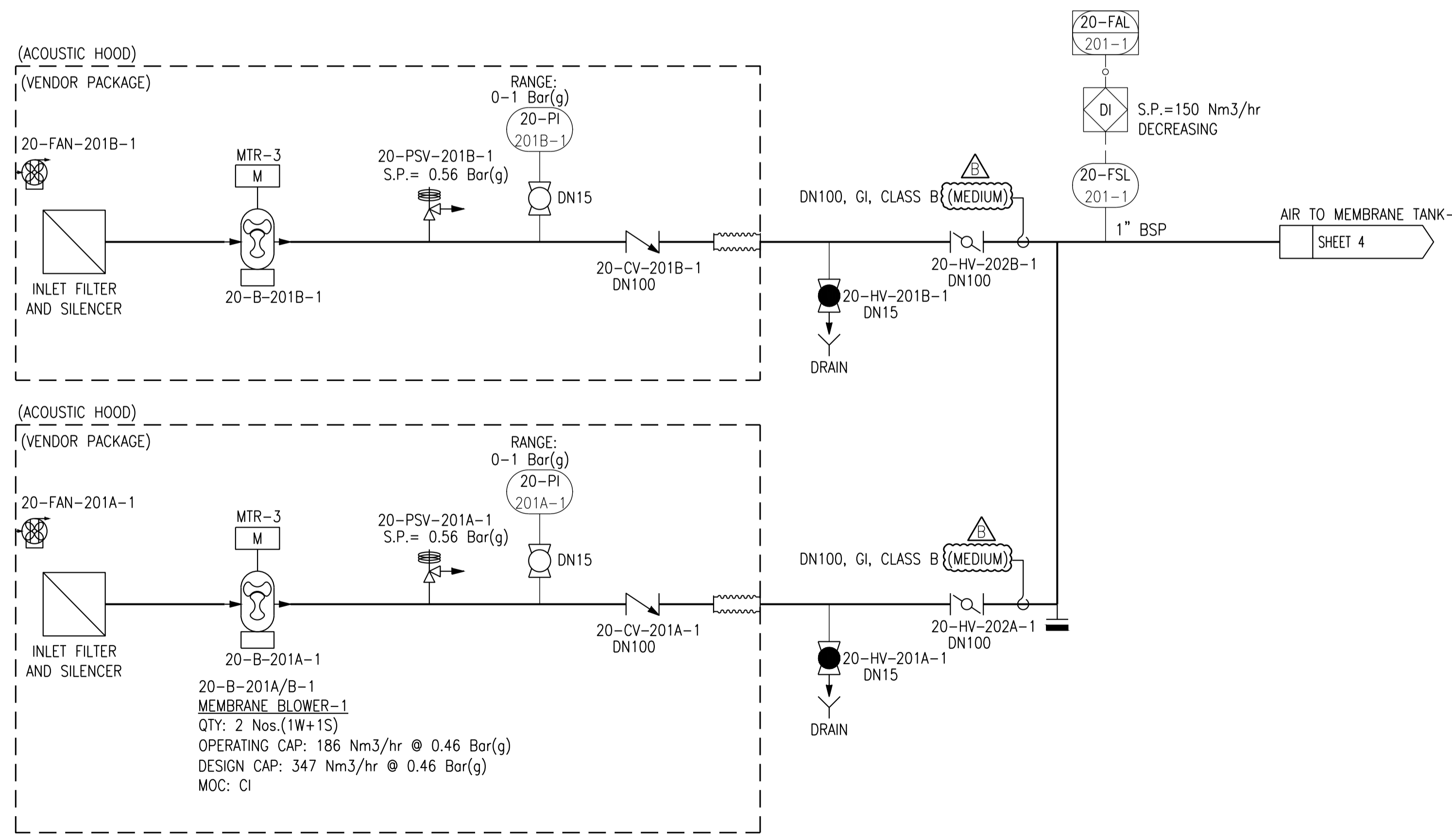
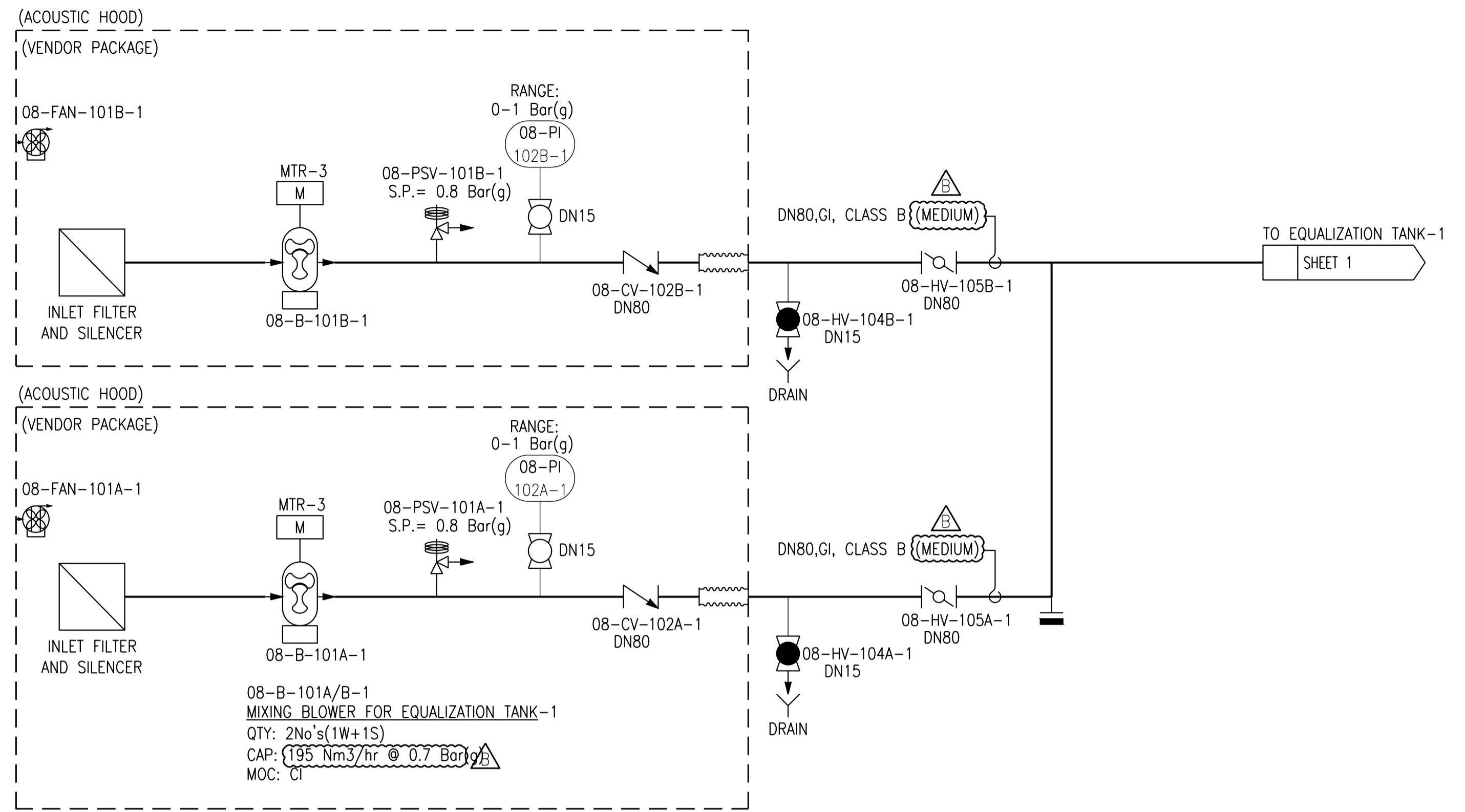
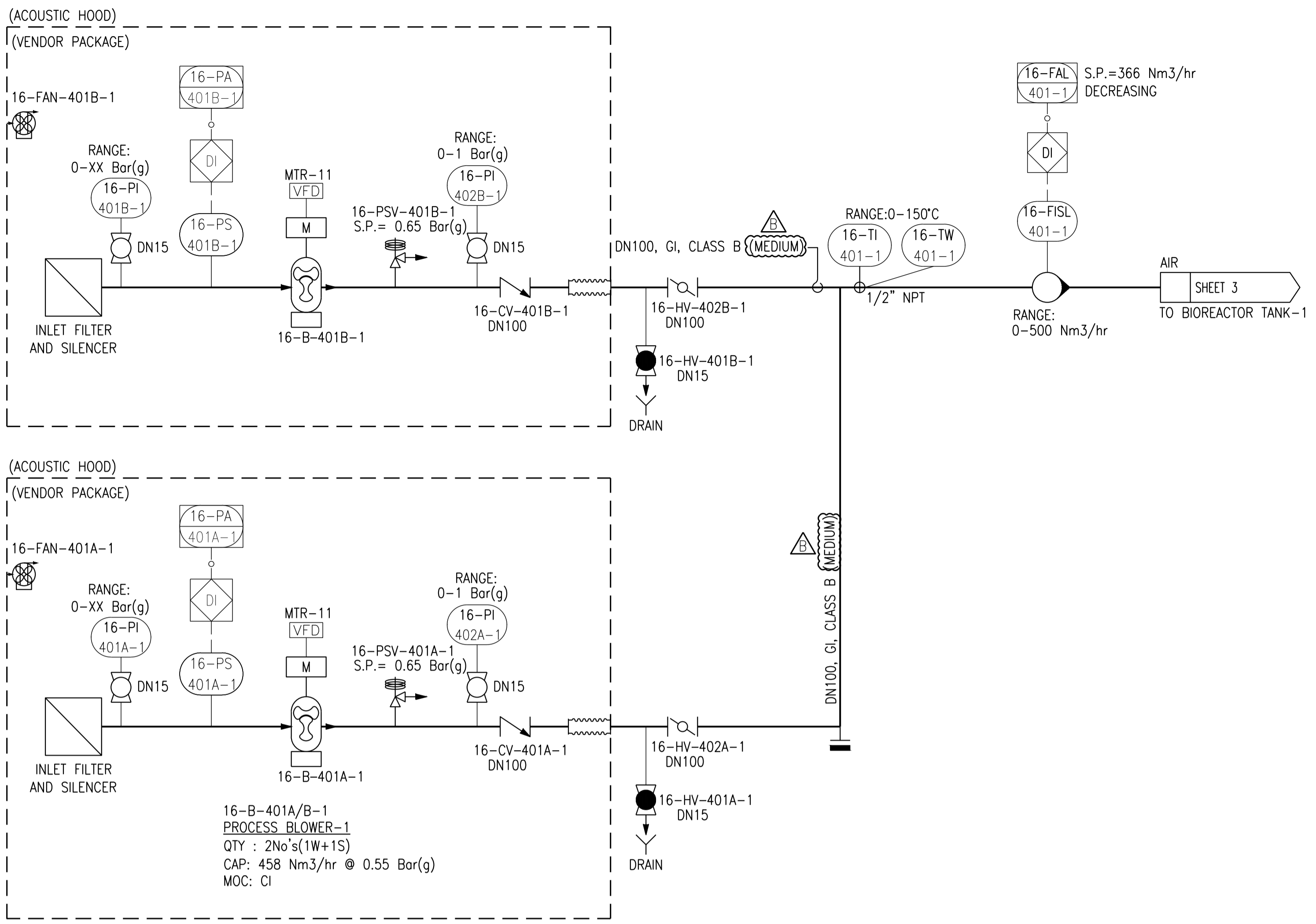
TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.x	FRAC
.xx	



CUSTOMER INFORMATION
IIT HYDERABAD
650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM
EQUALIZATION TANK & ASSOC. EQUIPMENTS

DRAWING NUMBER					REVISION
6038727-AP-01					B
PROJECT NO.		PART/MATERIAL NO.		SCALE	SHEET
6038727				A1	1 OF 10



NOTES:
1. REFER SHEET 1 FOR LEGEND AND GENERAL NOTE.
2. NEED TO CONSIDER ACOUSTIC ENCLOSURE FAN KW IN WITH LOAD LIST.

REV	DESCRIPTION	ECO	DWN	APPR	DATE	
B	REVISED PER CLIENT COMMENTS		KJ	KR	SK	26 Jul 18
A	INITIAL RELEASE		KJ	KR	SK	17 Jul 18

TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.X	FRAC
.XX	

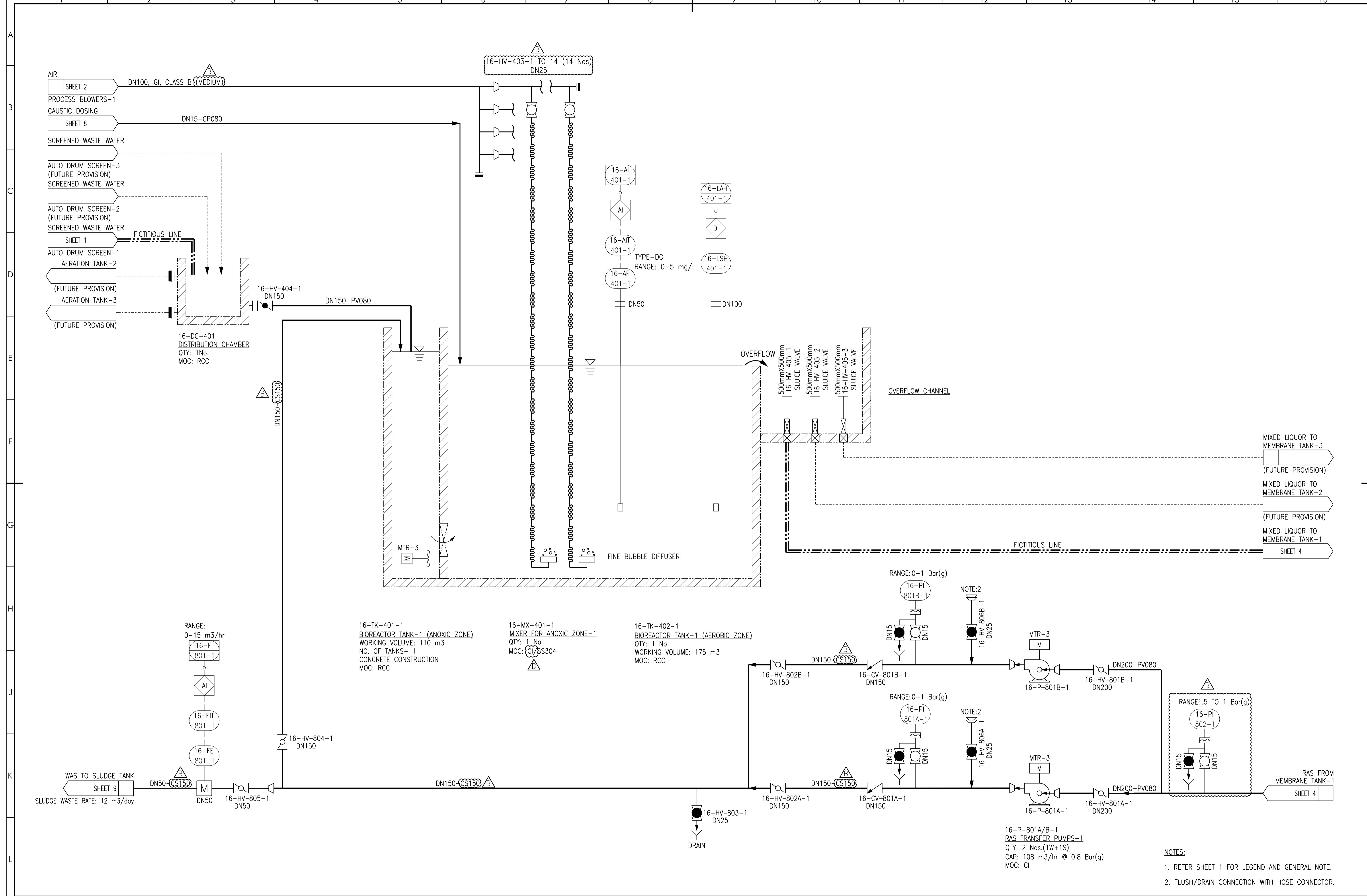


CUSTOMER INFORMATION
IIT HYDERABAD
650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM
PROCESS LAUNCHING / MEMBRANE BLOWER

DRAWING NUMBER		REVISION	
6038727-AP-01		B	
REF.:-	DOC. OWNER:	PROJECT NO.	PART/MATERIAL NO.
		6038727	
SCALE	SIZE	SHEET	
	A1	2 OF 10	

Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:25:16 IST



REV	DESCRIPTION	ECO	DWN	APPR	DATE
B	REVISED PER CLIENT COMMENTS			KJ KR SK	26 Jul 18
A	INITIAL RELEASE			KJ KR SK	17 Jul 18

TOLERANCES UNLESS NOTED
DECIMALS .x
ANGLES
FRAC. .xx



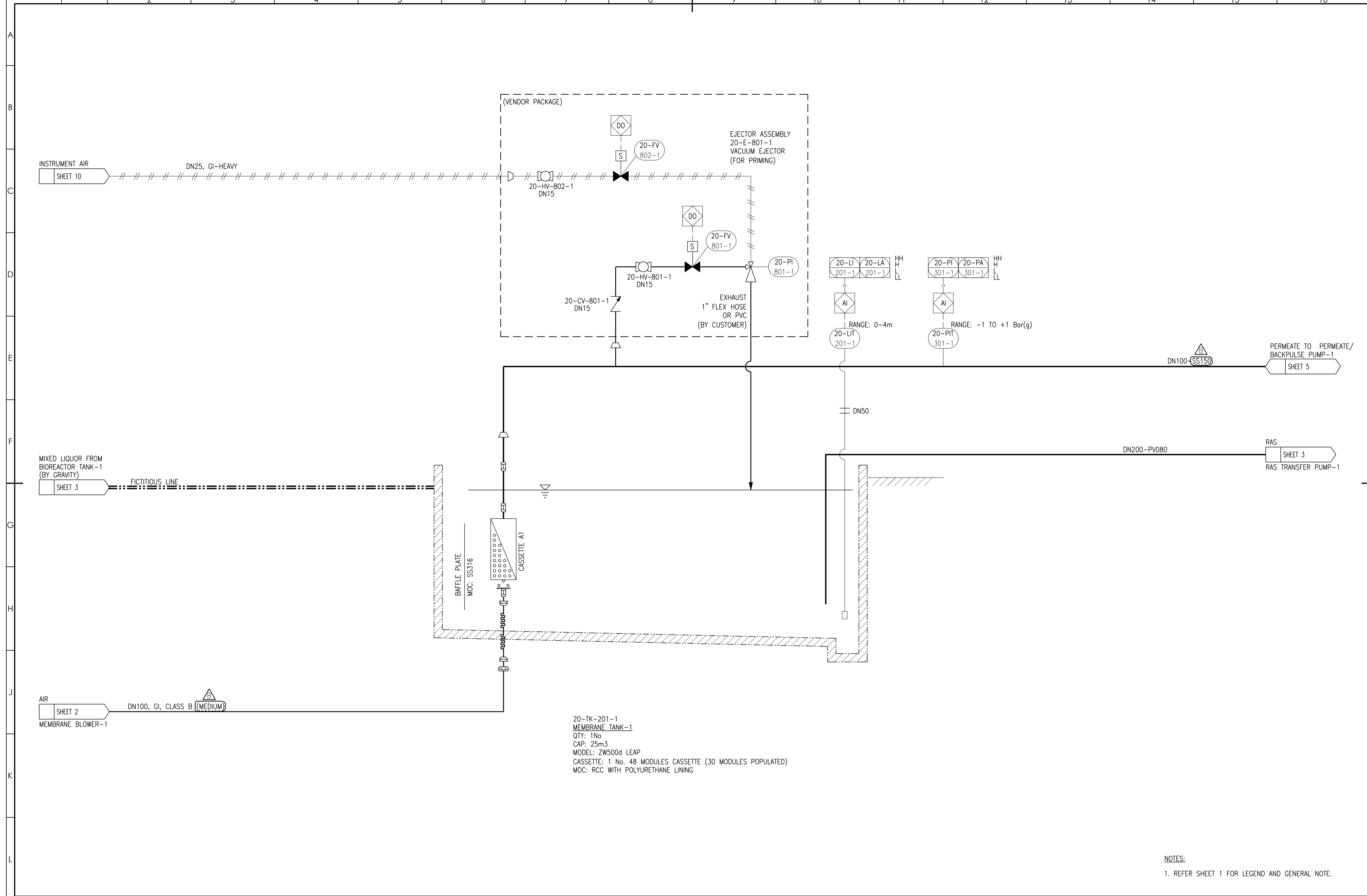
CUSTOMER INFORMATION
IIT HYDERABAD
650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM
BIOREACTOR TANK-1 ASSOC. EQUIPMENTS
Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER 6038727-AP-01					REVISION B
PROJECT NO. 6038727	PART/MATERIAL NO.	SCALE	SIZE A1	SHEET 3 OF 10	

- NOTES:
- REFER SHEET 1 FOR LEGEND AND GENERAL NOTE.
 - FLUSH/DRAIN CONNECTION WITH HOSE CONNECTOR.

FILE LOCATION: C:\Users\3252527\appdata\local\temp\kcrubsh_468\6038727-AP-01.dwg



20-TK-201-1
MEMBRANE TANK-1
 QTY: 1No
 CAP: 25m³
 MODEL: ZW500d LEAP
 CASSETTE: 1 No. 48 MODULES CASSETTE (30 MODULES POPULATED)
 MOC: RCC WITH POLYURETHANE LINING

NOTES:
 1. REFER SHEET 1 FOR LEGEND AND GENERAL NOTE.

REV	DESCRIPTION	ECO	DWN	APPR	APPR	DATE	
B	REVISED PER CLIENT COMMENTS			KJ	KR	SK	26 Jul 18
A	INITIAL RELEASE			KJ	KR	SK	17 Jul 18

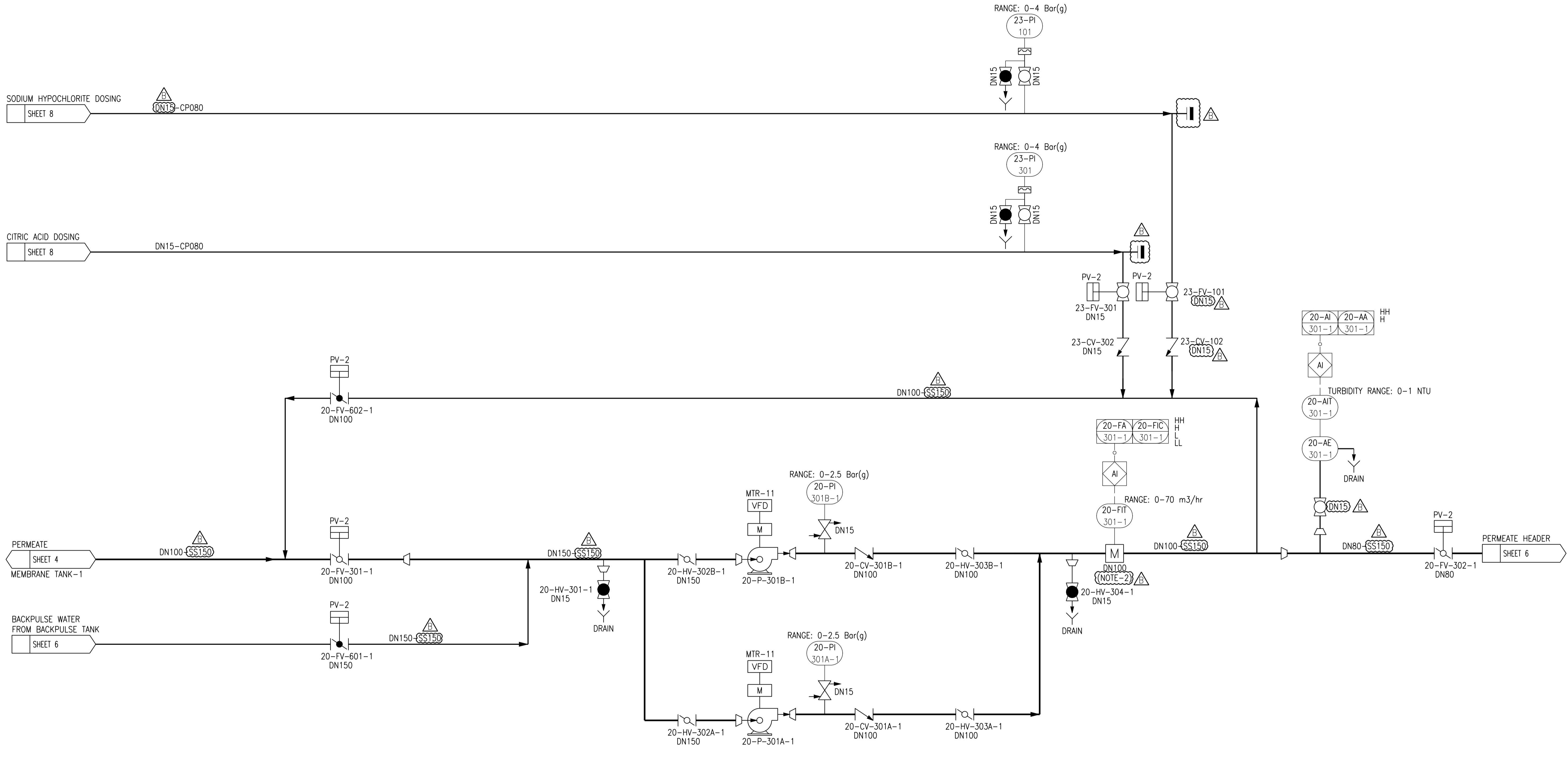
TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.X	FRAC
.XX	



CUSTOMER INFORMATION
 IIT HYDERABAD
 650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM
 MEMBRANE TANK & ASSOC. EQUIPMENTS
 MAHANKALI SATEESH
 Digitally signed by MAHANKALI SATEESH
 Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER					REVISION
6038727-AP-01					B
REF.:-		DOC. OWNER:			
PROJECT NO.	PART/MATERIAL NO.	SCALE	SIZE	SHEET	
6038727			A1	4 OF 10	



20-P-301A/B-1
 PERMEATE/BACKPULSE PUMP-1
 QTY: 2Nos. (1W+1S)
 PERMEATE FLOW: 32m³/hr EACH @ 0.72 Bar(g)
 BACKPULSE FLOW: 56m³/hr @ 1 Bar(g)
 MOC: CI BODY, SS316 IMPELLER

- NOTES:
- REFER SHEET 1 FOR LEGEND AND GENERAL NOTE
 - PIPING DOWNSTREAM OF MAGNETIC FLOW METER TO BE ROUTED UPWARD TO ENSURE MAGNETIC FLOW METER REMAINS FLOODED AT ALL TIME.

REV	DESCRIPTION	ECO	DWN	APPR	DATE	
B	REVISED PER CLIENT COMMENTS		KJ	KR	SK	26 Jul 18
A	INITIAL RELEASE		KJ	KR	SK	17 Jul 18

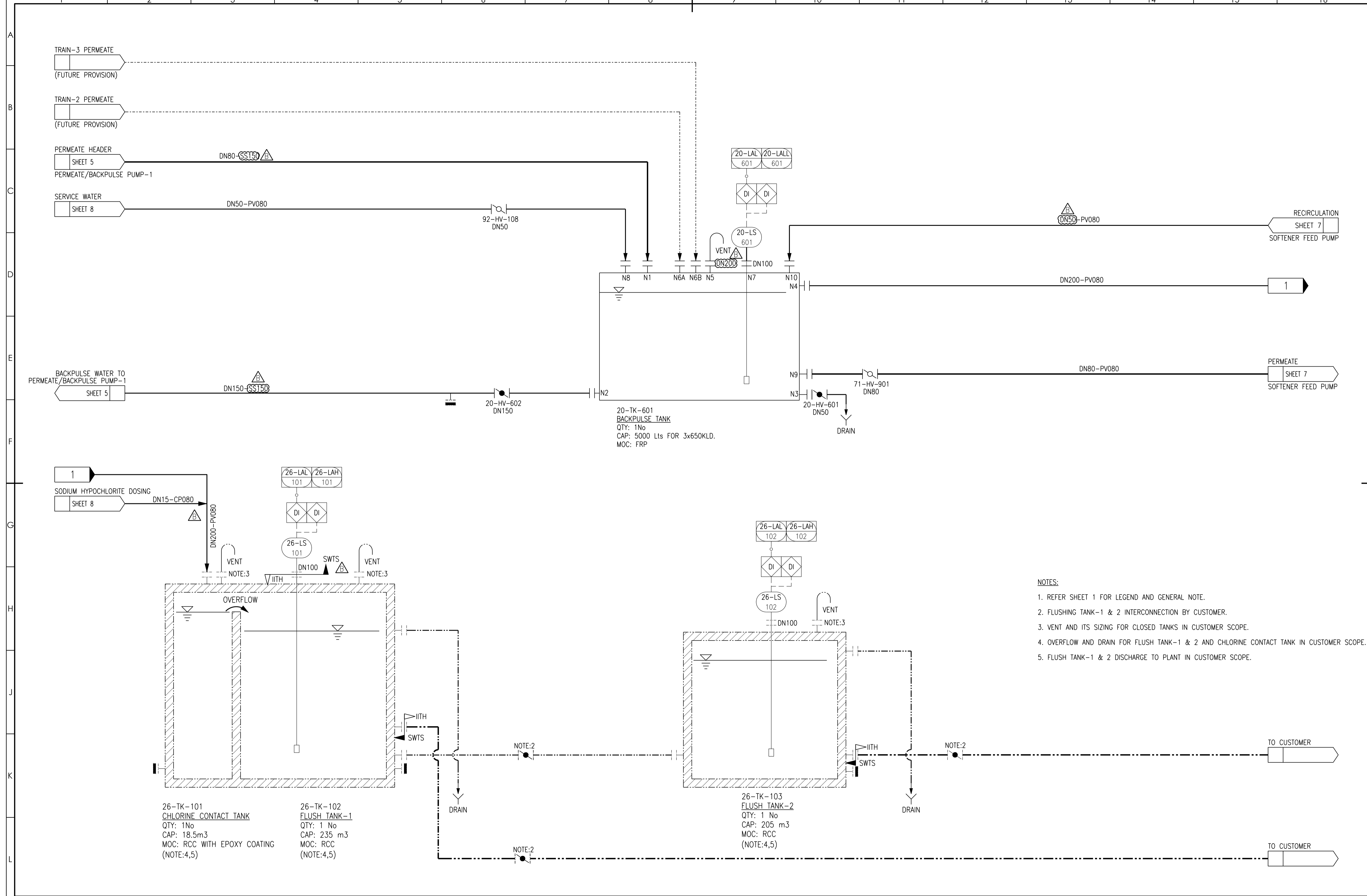
TOLERANCES UNLESS NOTED
DECIMALS .X
ANGLES .XX
FRAC



CUSTOMER INFORMATION
 IIT HYDERABAD
 650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM
 PERMEATE / BACKPULSE PUMP
 Digitally signed by MAHANKALI SATEESH
 Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER 6038727-AP-01					REVISION B
PROJECT NO. 6038727	PART/MATERIAL NO.	SCALE	SIZE A1	SHEET 5 OF 10	



REV	DESCRIPTION	ECO	DWN	APPR	DATE	
B	REVISED PER CLIENT COMMENTS		KJ	KR	SK	26 Jul 18
A	INITIAL RELEASE		KJ	KR	SK	17 Jul 18

TOLERANCES UNLESS NOTED	DECIMALS	ANGLES
.X		FRAC
.XX		



CUSTOMER INFORMATION

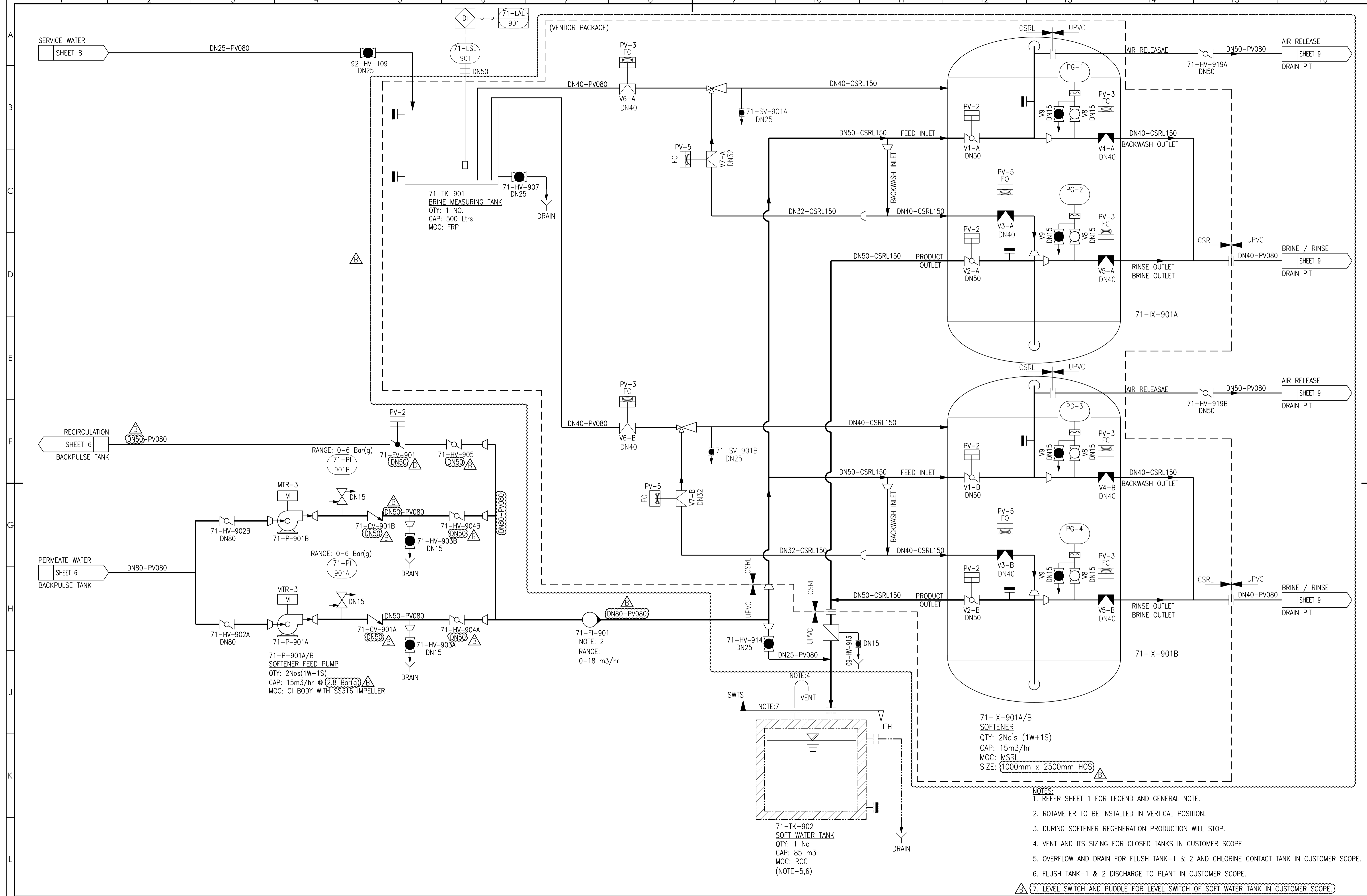
IIT HYDERABAD
 650 KLD STP-1

PIPING & INSTRUMENTATION DIAGRAM

BACKPULSE TANK & FLUSH TANK-1&2

Digitally signed by MAHANKALI SATEESH
 Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER					REVISION
6038727-AP-01					B
REF.:-		DOC. OWNER:			
PROJECT NO.	PART/MATERIAL NO.	SCALE	SIZE	SHEET	
6038727			A1	6 OF 10	



- NOTES:**
1. REFER SHEET 1 FOR LEGEND AND GENERAL NOTE.
 2. ROTAMETER TO BE INSTALLED IN VERTICAL POSITION.
 3. DURING SOFTENER REGENERATION PRODUCTION WILL STOP.
 4. VENT AND ITS SIZING FOR CLOSED TANKS IN CUSTOMER SCOPE.
 5. OVERFLOW AND DRAIN FOR FLUSH TANK-1 & 2 AND CHLORINE CONTACT TANK IN CUSTOMER SCOPE.
 6. FLUSH TANK-1 & 2 DISCHARGE TO PLANT IN CUSTOMER SCOPE.
- 7. LEVEL SWITCH AND PUDDLE FOR LEVEL SWITCH OF SOFT WATER TANK IN CUSTOMER SCOPE.**

REV	DESCRIPTION	ECO	DWN	APPR	DATE
B	REVISED PER CLIENT COMMENTS			KJ KR SK	26 Jul 18
A	INITIAL RELEASE			KJ KR SK	17 Jul 18

TOLERANCES UNLESS NOTED	
DECIMALS	ANGLES
.x	FRAC
.xx	



CUSTOMER INFORMATION

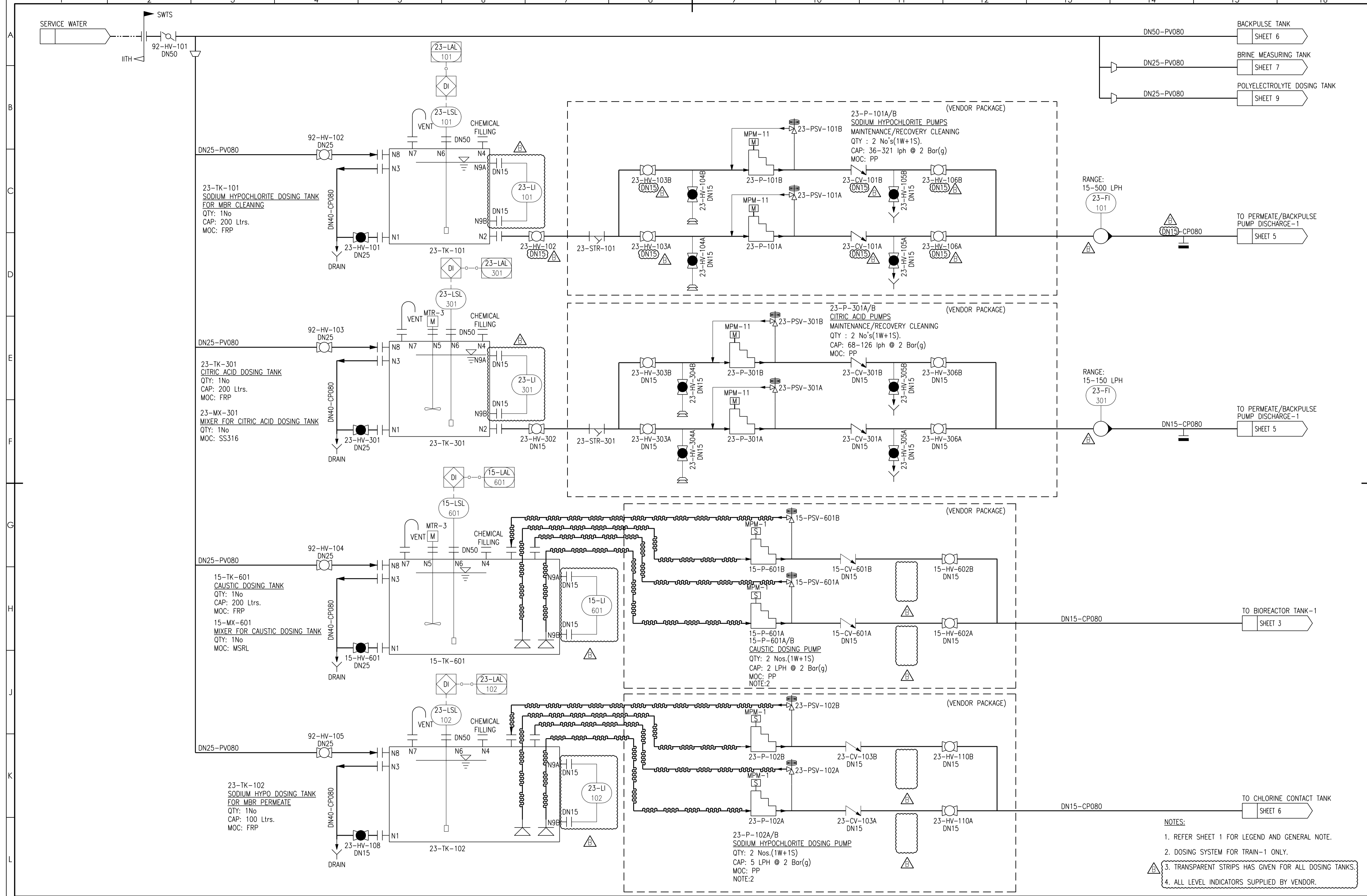
IIT HYDERABAD
650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM

SOFTENER

Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER					REVISION
6038727-AP-01					B
PROJECT NO.		PART/MATERIAL NO.		SCALE	SHEET
6038727				A1	7 OF 10



- NOTES:**
- REFER SHEET 1 FOR LEGEND AND GENERAL NOTE.
 - DOSING SYSTEM FOR TRAIN-1 ONLY.
 - TRANSPARENT STRIPS HAS GIVEN FOR ALL DOSING TANKS.
 - ALL LEVEL INDICATORS SUPPLIED BY VENDOR.

REV	DESCRIPTION	ECO	DWN	APPR	DATE
B	REVISED PER CLIENT COMMENTS			KJ KR SK	26 Jul 18
A	INITIAL RELEASE			KJ KR SK	17 Jul 18

TOLERANCES UNLESS NOTED

DECIMALS	ANGLES
.x	FRAC
.xx	



CUSTOMER INFORMATION

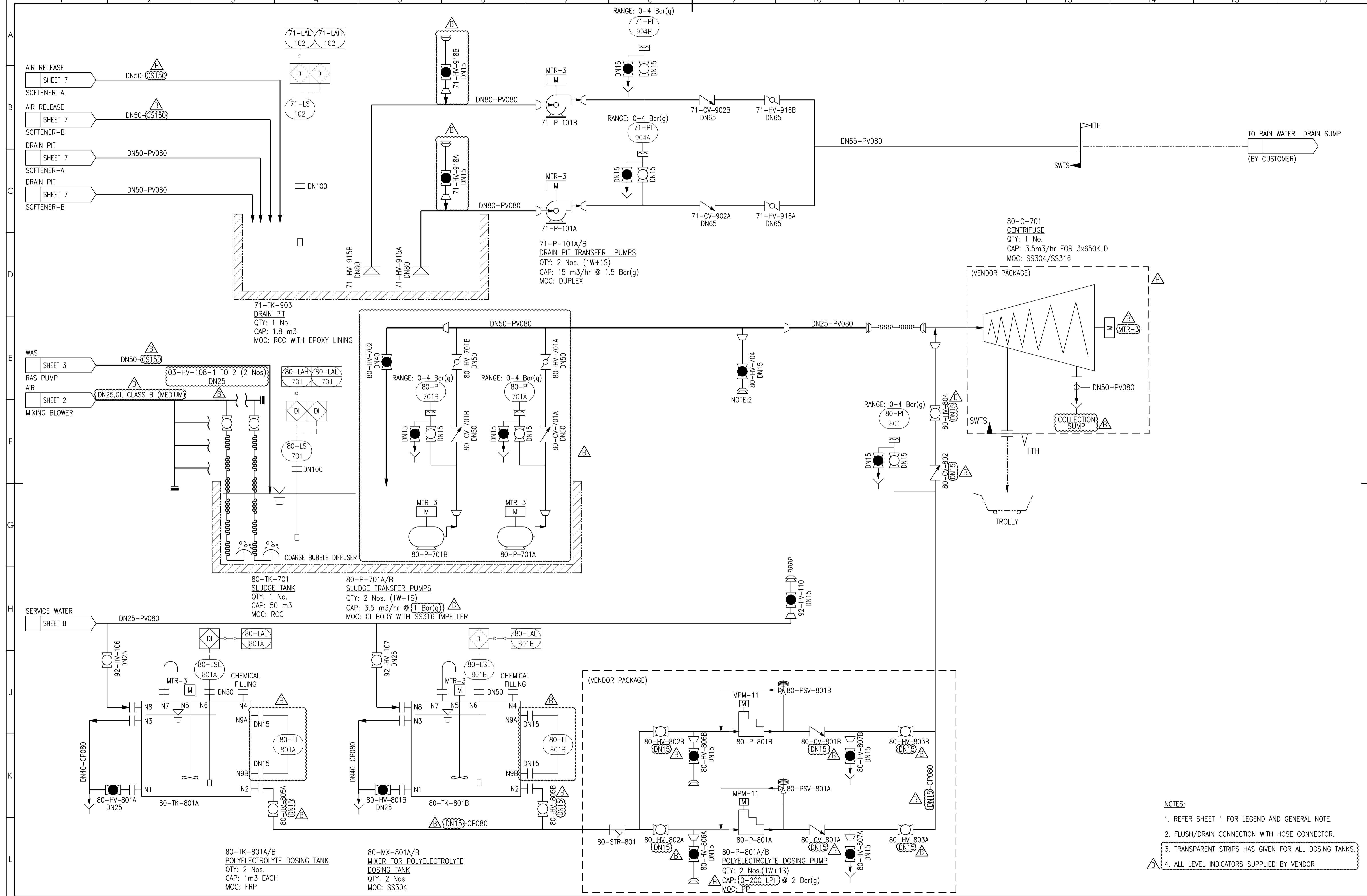
IIT HYDERABAD
 650 KLD STP-1

PIPING & INSTRUMENT DIAGRAM

CHEMICAL DOSING SYSTEM

MAHANKALI SATEESH
 Digitally signed by MAHANKALI SATEESH
 Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER		REVISION	
6038727-AP-01		B	
REF.:-		DOC. OWNER:	
PROJECT NO.	PART/MATERIAL NO.	SCALE	SIZE
6038727			A1
		SHEET	8 OF 10



- NOTES:**
- REFER SHEET 1 FOR LEGEND AND GENERAL NOTE.
 - FLUSH/DRAIN CONNECTION WITH HOSE CONNECTOR.
 - TRANSPARENT STRIPS HAS GIVEN FOR ALL DOSING TANKS.
 - ALL LEVEL INDICATORS SUPPLIED BY VENDOR

REV	DESCRIPTION	ECO	DWN	APPR	DATE	
B	REVISED PER CLIENT COMMENTS		KJ	KR	SK	26 Jul 18
A	INITIAL RELEASE		KJ	KR	SK	17 Jul 18

TOLERANCES UNLESS NOTED

DECIMALS	ANGLES
.x	FRAC
.xx	



CUSTOMER INFORMATION

IIT HYDERABAD
650 KLD STP-1

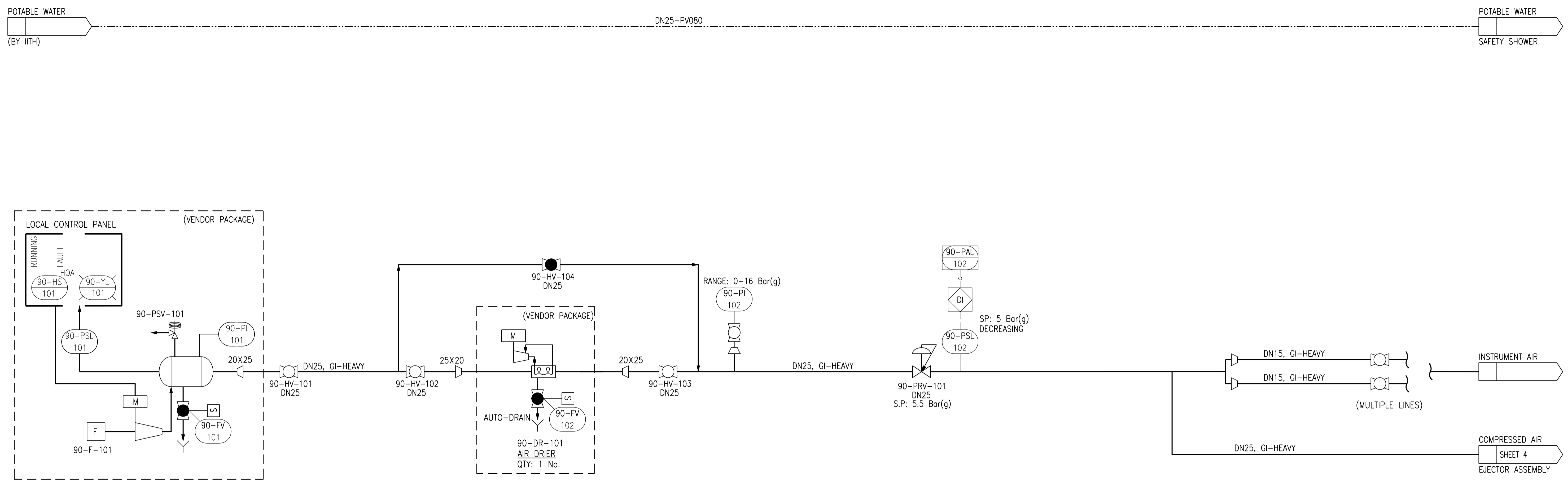
PIPING & INSTRUMENT DIAGRAM

SLUDGE HANDLING SYSTEM

MAHANKALI SATEESH
Digitally signed by MAHANKALI SATEESH
Date: 2022.10.10 19:25:16 IST

DRAWING NUMBER					REVISION
6038727-AP-01					B
REF.:-		DOC. OWNER:			
PROJECT NO.	PART/MATERIAL NO.	SCALE	SIZE	SHEET	
6038727			A1	9 OF 10	

FILE LOCATION: C:\Users\3252527\appdata\local\temp\Temp\Kcrubsh_4687638727-AP-01.dwg



90-AC-101
AIR COMPRESSOR
QTY: 1 No (1W)
CAP: 20 m³/hr @ 7 Bar(g)

90-TK-101
COMPRESSED AIR RECEIVER TANK
QTY: 1 No

NOTES:
1. REFER SHEET 1 FOR LEGEND AND GENERAL NOTE.

TOLERANCES UNLESS NOTED DECIMALS .X ANGLES .XX FRAC			CUSTOMER INFORMATION IIT HYDERABAD 650 KLD STP-1		PIPING & INSTRUMENT DIAGRAM AIR COMPRESSOR SYSTEM			DRAWING NUMBER 6038727-AP-01		REVISION B
PROPRIETARY AND CONFIDENTIAL: THIS DRAWING AND ALL INFORMATION AND KNOWLEDGE CONTAINED OR REFERRED HEREIN ARE THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF SUEZ AND AS SUCH ARE INSTRUMENTS OF SERVICE FOR USE SOLELY WITH RESPECT TO THIS PROJECT. THESE INSTRUMENTS OF SERVICE SHALL NOT BE REPRODUCED, TRANSMITTED, DISCLOSED OR USED OTHERWISE IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN AGREEMENT BY SUEZ AND MUST BE IMMEDIATELY RETURNED OR DESTROYED UPON REQUEST.			MAHANKALI SATEESH Digitally signed by MAHANKALI SATEESH Date: 2022.10.10 19:25:16 IST		PROJECT NO. 6038727		PART/MATERIAL NO. SCALE SIZE A1		SHEET 10 OF 10	