

INVITATION FOR EXPRESSION OF
INTEREST FOR
SUPPLY, INSTALLATION, TESTING AND
COMMISSIONING
OF
MBR FOR 3.5 MLD ETP with 150 M3/HR RO PLANT
AT PALANPUR, GUJARAT ON
BUILD-OWN-OPERATE or **BUILD-OWN-OPERATE-
TRANSFER** BASIS



REF:BNS/PROJECT/PLN/ETP RO-BOO or BOOT



BANASKANTHA DISTRICT COOP.MILK PRODUCER'S UNION LTD.

BANASDAIRY,PB NO 20,PALANPUR 385001, DIST:
BANASKAHA,GUJARATPHONE:253881-85.FAX:02742-252723

Ref: BNS/PROJECT/PLN/ETP RO-BOOT

15/03/2024

INVITATION FOR EXPRESSION OF INTEREST (EOI)

Banaskantha District Co-operative Milk Producers' Union Limited, Banas Dairy, P.B. No. 20, Palanpur-385001, Gujarat invites sealed bids from reputed eligible contractors for the following works for its plant at Banas Dairy Sankul, Sanadar, Taluka: Deodar, District: Banaskantha ,Gujarat.

Sr. No	EOI Ref	Name of work	Time Limit
1	BNS/PROJ ECT/PLN/ ETP RO- BOOT	Design, Manufacture, Supply, Installation, testing and commissioning of MBR FOR existing 3.5 MLD ETP with 150 m ³ /Hr RO Plant at Palanpur, Gujarat on BOO or BOOT Basis	12 Months

- EOI Publish date : 18/03/2024 from 11:00 Hrs
- Prebid meeting : 08/04/2024 at 11:00 Hrs
- Last date for submission of EOI : 16/04/2024 up to 15:00 Hrs

The details of eligibility criteria, EOI Commercial and technical Detail are available on our website www.banasdairy.coop. Banas Dairy does not bind itself to accept the lowest bid. Banas dairy reserves the right to award the job either part or full. Banas dairy at its sole discretion and without assigning any reason thereof, also reserves the right accept any/or reject any or all bids

I/C MANAGING DIRECTOR

DETAIL FOR INVITATION FOR EXPRESSION OF INTEREST

This document shall provide guidelines to bidders for preparing the proposal. Structure of this document is as follows:

Section1 Eligibility and Qualification requirements

Section2 Introduction

Section3 Design Basis

Section4 Scope of work and Technical specification

Section 5 Terms & condition and price format

Section 5 Battery limit

Section 6 List of preferred makes

1. Eligibility and Qualification requirements

The bidder must meet the following minimum qualification criteria:

1. The bidder's average financial turnover in the same name and style during each of the last three financial years (i.e. 2020-21, 2021-22 and 2022-23) should not be less than INR **1500 lakhs**. Balance sheet and income tax return as a documentary evidence shall be provided for the proof of financial turnover.
2. The bidder in the same name and style shall have successfully executed / completed contracts of similar nature (Effluent treatment plant / MBR / Recycle RO) either of the following: -
 - a) One contract costing not less than INR **800 lakhs**
 - OR**
 - b) Two contracts each costing not less than INR **500 lakhs**
 - OR**
 - c) Three contracts each costing not less than INR **300 lakhs**

Copy of the purchase orders and their Completion certificates for the work mentioned in the qualification criteria shall also be submitted.

3. The bidder should have valid registration under various acts that may be applicable for the contract proposed. This shall include but not limited to income tax, GST, Employee State Insurance, Contract Labour, Provident Fund etc.
4. In addition to the above, the following information / documents should also be submitted along with the bid by the bidder for evaluation / determination of their eligibility:
 - a. Copy of income tax returns for three financial years as mentioned above in original or certified true copies, along with Permanent Account Number (PAN) for income tax purpose.
 - b. Copy of TDS certificate issued by the clients to substantiate the claim for the value of works in the private sector.
5. Even though the bidder meet the specified criteria, the EOI may be disqualified in case the bidder has:
 - a) Made untrue or false declaration in the forms, statements and attachments submitted in proof of their qualifications.
 - b) Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion or financial failure etc.

Bidder has to submit eligibility criteria document in sealed cover before pre bid meeting (on or before: 03-04-2024).

Prebid clarification will be given to those bidder who will become eligible as per eligibility criteria.

2. INTRODUCTION:

Banaskantha District Co-operative Milk Producers' Union Ltd has a 5100 m³/day capacity ETP plant at Palanpur location. Out of them 1600 m³/day treated water generated from MBR based new ETP plant and 3500 m³/day treated water generated from secondary clarifier in the existing ETP plant.

Banas Dairy, Palanpur envisages to set up RO plant having the capacity of 150 m³ / hour with MBR for 3500 MLD ETP plant with all required Utilities at village: Palanpur, Taluka: Palanpur, Banaskantha District.

This section of the bidding documents outlines the technical specifications for the Design, Manufacture, Supply, Erection, Testing and commissioning of the MBR & RO plant at Banas Dairy, Palanpur.

These technical specifications are for the guidance of the bidders only and not intended to bring out all the details of design and fabrication of the equipment or equipment components. The successful Bidder shall be fully responsible to undertake all the work involved in the design, engineering, manufacture including the erection, testing and commissioning of the MBR & RO plant.

Bidders are to note that the MBR & RO plant being offered in this bid shall be on Turnkey basis, within the battery limits. The work being carried out shall confirm to high standards of engineering design & workmanship. The equipment offered shall be capable of performing in continuous commercial operation to meet agreed performance standards and acceptable to the purchaser/client. No exclusions of any nature are acceptable, other than those specifically detailed in this bidding document.

The bidders are required to provide all technical data/information wherever asked for. Any bid not following the bid format structure or provided with insufficient technical data/information/documents is liable to be considered as non-responsive.

The Purchaser will interpret the meaning of various equipment specification and drawings submitted by the bidder and shall have the right to reject any material/equipment, which in their opinion is not in full accordance to tender specifications.

3. Design Basis:

Banas Dairy has a setup of dairy plant at Palanpur location in the district of Banaskantha in Gujarat state. There are milk reception and processing plant. There are butter, powder, ice-cream, paneer, cheese, ghee, UHT and pouch milk manufacturing facilities also in the same location.

Approximate 5100 m³ per day effluent are being generated from all the plants. Out of this 1600 m³ per day effluent are treated in new ETP plant and 3500 m³ per day effluent are treated in old ETP plant. For the reuse of treated effluent, Banas Dairy planning to install energy efficient MBR for 3.5 MLD Effluent treatment plant & 150 m³ /hour RO plant in the same premises. RO plant shall be common for both the ETP plant.

Refer below inlet and outlet water parameter.

Inlet raw effluent (at the inlet of ETP) water parameter:

S. NO.	DESCRIPTION	UNIT	VALUES
1	TDS	ppm	Max.: 6000 Average : 3000
2	pH	--	6 to 10
3	TSS	ppm	2000 to 2500
4	COD	ppm	7000 to 8000
5	BOD	ppm	3500 to 4000
6	FOG	ppm	1500 to 2000
7	Ammonical Nitrogen	ppm	100 (max.)
8	TEMP	°C	35 to 50

(Note: TDS include 75% well water consumption, 25% Dharoi Reservoir water consumption and Reject from water treatment plant, CIP of processing plant.)

Treated water outlet parameter of Existing MBR outlet (inlet of RO) (1600 m3/Day):

S. NO.	DESCRIPTION	UNIT	VALUES
1	TDS	ppm	Max. : 6000 Average : 3000
2	pH	--	6.5 to 8.5
3	TSS	ppm	<5
4	COD	ppm	< 50
5	BOD	ppm	<10
6	FOG	ppm	NIL
7	Temperature	Deg C	25 to 38
8	Total hardness	ppm	600
9	Cloride	ppm	1120

Treated water outlet parameter of existing 3.5 MLD aeration (Inlet of proposed MBR) :

S. NO.	DESCRIPTION	UNIT	VALUES
1	TDS	ppm	Max. : 6000 Average : 3000
2	pH	--	6.5 to 8.5
3	TSS /MLSS	ppm	3500 to 4000
4	COD	ppm	500
5	BOD	ppm	200
6	FOG	ppm	15 to 20(max.)
7	Temperature	Deg C	10 to 38
8	Total hardness	ppm	1200
9	Cloride	ppm	4000

Parameter to be maintained for proposed MBR outlet (inlet of RO):

S. NO.	DESCRIPTION	UNIT	VALUES
1	TDS	ppm	Max : 6000 Average : 3000
2	pH	--	6.5 to 8.5
3	TSS	ppm	<5
4	COD	ppm	< 50
5	BOD	ppm	<10
6	FOG	ppm	NIL
7	Turbidity	NTU	< 1

NOTE: Above parameter are only for the reference. Supplier to take day wise composite samples of MBR treated water which to be feed in to RO plant and aeration water which is to be feed to proposed MBR. Bidder has to check the required water parameters in their own reliable lab and on that basis they have to design the RO plant. Bidder has to also analyze the effluent water of aeration for the feed of Proposed MBR and MBR has to design based on the testing parameter. However, RO shall be designed for the minimum parameter as mentioned above. Tested water parameter report must share with Banas dairy.

PARAMETER TO BE MAINTAINED FOR PROPOSED RO OUTLET (Permeate water)

S. N.	PARAMETERS	UNIT	VALUES
1	Total Dissolved Solids	PPM	< 50
2	Chloride as Cl	PPM	< 5
3	Total hardness as CaCO ₃	PPM	< 5
4	pH	--	6.5 to 7.5
5	Conductivity	mS/m	< 75
6	COD	PPM	NIL
7	BOD	PPM	NIL
9	Turbidity	NTU	<0.2
10	Particle Size	um	<5
11	Slow growing bacteria	cfu/ml	<5000
12	E-Coli	cfu/100ml	NIL
13	Coliform bacteria	cfu/100ml	NIL

Note: Remaining RO permeate water parameter result should be as per IS 10500 Based on above parameter bidder has to provide best treatment scheme to achieve final water parameter as mentioned above. Bidder has to select best treatment scheme available in market.

Treated RO water to be used in Boiler feed water, cooling tower/Condenser makeup, crate washer and dairy equipment CIP, milk/product pushes/purges, tanker flushing, rinse milk recovery, water for separators, for preparation of reconstituted milk, human drinking etc. There shall be provision for the future reject RO and multiple effective evaporation. Bidder has to provide only provision for future. Bidder has to provide space in the skid also for future reject RO. Supply of reject RO treatment and multiple effective evaporation not in the scope.

4. SCOPE OF WORK and TECHNICAL SPECIFICATION

Banas Dairy will provide land only for the installation of plant. Civil work and mechanical work shall be in the scope of bidder. Banas Dairy will not pay any amount against supply & installation and commissioning of MBR, RO Plant and related accessories as per requirement and battery limit.

After installation and commissioning of plant Banas Dairy will purchase RO water on Built-Own-Operate (BOO) or Built-Own-Operate-Transfer (BOOT) basis.

Rated Capacity of MBR shall be 3500 m³/Day (MBR outlet permeate water).

MBR Technical Details:

Bidders to design and select the most suitable type of MBR membranes which are proven and tested for similar nature and type of MBR systems successfully operating in Dairy, Industrial effluents only.

Design Inputs to be considered:

Flow: 3500 cum/day.

S. N.	Description	Specification
1	Separate MBR-Civil tank size	Suitable size tank with partitions to be provided as per MBR- OEM design requirements. RCC tank with Chemical coating as recommended by OEM shall be in the scope of supplier.
2	Purpose	Ultra Filtration membrane for separating bio solids of Aeration system to attain the desired treated effluent parameters.
3	Capacity	1170 m ³ /day for each MBR bank
4	No of MBR cassette Bank	03
5	No. Of membrane cassette	As per OEM design + 15% spare (dummy) module shall be provided for future capacity expansion (bidder to specify)
6	Design Flux	Flux rate shall be less than 17 LMH
7	Surface area of one membrane module	As per OEM design (bidder to specify)
8	Type	Submerged Hollow Fibre / flat sheet factory assembled
9	Operation	Outside In
10	MOC	Poly Vinylidene fluoride (PVDF)
11	Modular frame	SS 316L
12	Sludge concentration	Upto 12000 mg/ltr (max.)
13	Cleaning Chemicals	Citric acid and Sodium Hypo chloride
14	Performance Guaranteed Parameters (Outlet of Membranes)	BOD < 10 ppm COD < 50 ppm as Biodegradable TSS < 5 ppm Turbidity < 1 NTU FOG :NIL
15	P&ID	Bidder has to follow approved P&ID's from OEM

16	Lifting arrangement	Bidder to consider and provide suitable lifting arrangement with Geared chain pulley block for lifting membrane cassettes. Supports and structure shall be hot dip GI. Tools for membrane cassette lifting and membrane module removal shall be provided.
17	Testing, Commissioning & Training	Bidders to depute OEM supervisory support. Commissioning shall be done in the presence of OEM
18	Plant, Equipment & Accessories	OEM to provide guarantee to end user/ client

Following arrangement shall be provided with MBR

- Bidders should provide suitable accessories for the MBR system as per OEM design and functional requirements.
- A brief /tentative list of accessories like, air blowers, ejector system, permeate pump with accessories, RAS pumps, CIP system including dosing system and chemical preparation tank with 1 day backup capacity, pumps, air compressor, instrumentation like, flow meters (individual flow meter for each cassette bank), pressure & level transmitters, Piping, valves, actuators etc as per OEM design and functional requirement is in the scope of the MBR system.
- Puddle pipes, MBR Cassette support inside membrane tank should be SS316L.
- Permeate header should be SS316L (minimum) from membrane tank to treated water tank.
- Required FRP Grit platform with HDGI structure, ladder and railing for the operator and maintenance of MBR cassettes.
- Required pumps, valves and piping, back wash water storage tank.
- All the interconnecting piping shall be SS 316L.
- Supplier has to provide the cleaning facility for MBR cassettes required civil work flooring shall be in the scope of supplier.
- Storage facility for all MBR cassettes as recommended by OEM shall be in the scope of supplier. Supplier has to maintain required temperature in the storage facility.
- MBR system shall be approved by the OEM also and installation and commissioning shall be done in the presence of representative of MBR OEM.

Note:

The Bidder has to submit the detailed data sheets for the complete MBR system (Equipment wise) along with the bid. The OEM credentials and their client reports for the MBR systems offered are to be submitted for successful commissioning of similar system in Food industry.

Rated Capacity of RO plant shall be 150 m³/Hr (RO outlet permeate water).

RO Plant Details

Multi stage RO system

S. N.	Description	Specification
1	Number of stages	2 stage RO
2	Feed Flow m ³ /hr	Suitable
3	Total Recovery	90 %
4	Final Permeate Flow Rate	150 M ³ /Hr
5	MOC of skid	SS 304
6	Membrane Qty.	01 Lot
7	MOC of membrane	TFC

8	Design TDS for membrane	Max. 6000
9	Membrane Flux rate	less than 18 MLH
	Pressure tube	
10	Qty.	01 Lot
11	No of Element Long	as requirement
12	Pressure Rating	Minimum 450 PSI
13	MOC	FRP

The list of other equipment and accessories with technical shall be as under:

Sr. No.	Description of equipment/item	Capacity/size	Qty	Unit
1	Rotary screen before 3.5 MLD MBR Motorized Mechanical type. size of 2 mm. (MOC-SS304) This screen shall be installed between existing DAF and aeration. There shall be single common screen for all the 3 aeration. Required modification in the existing piping shall be in the scope of supplier. Civil work pertaining to land excavation and missionary etc. required for the screen installation shall be in the scope of supplier.	4 MLD	1	Nos
2	Membrane bio reactor (MBR) cassette bank with accessories – as mentioned above	1170 m3/day each train	03	Set
3	Air blower for MBR (working) – Twin / Tri lob type, MOC: CI	Suitable	03	Nos
4	Air blower for MBR (store spare complete with motor and ready to replace) - Twin / Tri lob type, MOC: CI	Suitable	01	Nos
5	Sludge recirculation pump for MBR (working) – MOC of impeller/casing : SS 316	Suitable	03	Nos
6	Sludge recirculation pump for MBR (store spare complete with motor and ready to replace) - MOC of impeller/casing : SS 316	Suitable	01	Nos
7	Permeate water pump for MBR (working) - MOC of impeller/casing: SS 316	Suitable	03	Nos
8	Permeate water pump for MBR (store spare complete with motor and ready to replace) - MOC of impeller/casing: SS 316	Suitable	01	Nos
9	On line COD meter- for measurement of COD, BOD,TSS,Ph .	Suitable	01	Lot
10	Electromagnetic flow meter	Suitable	01	Lot
11	Level sensor with transmitter (non contact type ultra sonic)	Suitable	01	Lot
	RO PLANT			
12	Feed pump from MBR permeate water tank to ACF-- MOC of impeller/casing : SS 316	Suitable	02	Nos
13	Steam sanitization activated carbon filter (1 W +1S) – MOC: SS 304, carbon media make: norit, water grade carbon.	Suitable	01	Set
14	Micron Cartridge filter- MOC of housing : SS316, MOC of cartridge : PP, 5 Micron, each set (1 x 50 %) shall be in the upstream of each RO Pass	Suitable	2	Set

15	Hypo Dosing System With 2 nos Dosing Pump and Dosing Tank	Suitable	01	Set
16	SMBS Dosing System with 2 nos Dosing Pump and Dosing tank	suitable	01	Set
17	Auto pH Correction Dosing with 2 nos dosing pump and Dosing tank	Suitable	01	Set
18	Antiscalent Dosing System with 2 nos Dosing Pump and Dosing Tank	Suitable	01	Set
19	RO Feed pump / booster pump /High Pressure Pump - MOC of impeller/casing : SS 316	Suitable	02	Nos
20	Multi stage RO system- with skid, membrane and pressure tube with required accessories – as mentioned above	Suitable	01	Set
21	Pump for reject water with controls and conductivity meter- MOC of impeller/casing : SS 316	Suitable	02	Nos
22	RO Cleaning System including Micron Cartridge Filter with dosing pumps and tank	Suitable	01	Set
23	Degasser(DG) System with DG tank and blower (blower : 1w +1s), MOC: MSRL , Blower : Centrifugal, MOC: MS/CI	Suitable	01	Set
24	RO permeate storage pump (DG to storage tank) - MOC of impeller/casing : SS 304	75 m3 / Hr.	03	Nos
25	UV system (Outlet) : Medium pressure , capacity: 150 m3/hr	suitable	01	Set
26	RO Permeate Water Storage Tank with required accessories :MOC : SS 304, Thickness: Shell thk. 5 mm for height 4 mtr. from bottom, 4 mm for height from 4 mtr. to 8 mtr. and 3 mm for 8 mtr. to 12 mtr. Thickness: bottom 5 mm , top 4 mm	250 KL	02	Nos
27	Vertical pump with Hydro flow system and required accessories - MOC of impeller/casing : SS 304	75 m3 / Hr.	03	Nos
28	Flow Meter - Vortex flow meter for the conductivity less than 50 microsiemens and magnetic flow meter for the conductivity more than 50 microsiemens.	Suitable	01	Lot
29	Level sensor with transmitter (non contact type ultra sonic)	Suitable	01	Lot
Common Accessories for MBR and RO				
30	Structural support with puddles, inserts, foundation bolts, lifting system with chain block etc.	Suitable	01	Lot
31	IMCC with APFC panel complete MBR, RO plant with UPS, voltage stabilizer of suitable rating for PLC power supply, busbar shall be copper For harmonic filter there should be DC chock min 3% impedance/input chock minimum 3% impedance in the VFD. All the dosing pumps, Chain pulley block shall have DOL starter. Remaining the entire feeder shall have VFD feeder. There shall be 15 % spare feeder in the IMCC.	Suitable	01	Lot
32	Power cable from PCC to IMCC (Aluminum) including supports , cable tray etc.- suitable run with considering installed equipment load and	3.5C x 300 sq.mm	suitable	Mtr.

	voltage drop less than 5 %			
33	Power and control cables (Copper) with FRP / GRP/SS 304 cable trays and electrical accessories including motor isolators, emergency push button station, chemical earthing with earthing strip / cables, rubber mat etc.	Suitable	01	Lot
34	<p>Automation system including PLC and SCADA (automation hardware, software with instrumentation and electrical items)</p> <p>The High End PLC shall be used for centralized operation of the plant. The High End PLC system offered shall have open architecture and shall use common engineering tool for operator station, automation system, communication system, engineering system and I/O.</p> <p>In each high degree of System availability and reliability with necessary spare viz. 20% spare I/O pre wired in each panel (RIO or main panel), 40% spare memory for main high end PLC CPU after finalization of the logic, 35% spare SCADA tags in the main CPU, 20% spare back plane slots, switches, network components etc.</p> <p>Power supply for the PLC should be redundant for the main panel as per as the new RIO panels.</p> <p>The system software of approved make will be based on open architecture/protocol and shall support minimum 64-bit processing platform. It shall be latest object oriented software, which result in fully scalable system. Approved make original license version of the latest release of software full addition engineering, SCADA development and client licenses shall be used and provided to Purchaser. The system shall use Fiber optics as backbone. For networking Ethernet model will be in use. Application, DATA base, backup, windows software with required original license, version firmware & drivers shall be provided.</p> <p>The automation software should be from the Siemens/Rockwell/Schneider make. Engineering software and SCADA software should be such latest version and should be capable to communicate with MBR and RO plant.</p>	Suitable	01	Lot

SCADA and MIS PC Specification shall be as under:

	All the industrial PCs like ES/OS, OS	MIS Server/ SCADA Server	MIS CLIENT PCs AND OTHER PCs
MAKE	DELL / HP	DELL / HP	DELL / HP
PROCESSOR	Min. intel core i7, six core or better	Min. intel Xeon, eight core or better	Min. 8th generation intel core i5 or better
OPERATING	Windows 10	Windows server 2016	Windows 10

SYSTEM	professional 64 with latest service pack or latest(OEM)	or latest (OEM)	professional 64with latest service pack or latest(OEM)
MAIN AND HARD DRIVE	Min.500 GB SSD For OS and 1TB HDD for storage	Min.500 GB SSD and 1 TB HDD*3 Raid 5	Min.250 GB SSD For OS and 1TB HDD for storage
RAM	Min. 32 GB (16GB+16GB),	Min. 32 GB (16GB+16GB), expandable to 128GB	Min.16 GB(8GB+8GB)
LAN CARD	1 Nos Extra Lan card with 2 ports	1 Nos Extra Lan card with 2 ports	1 Nos Extra Lan card with 2 ports
MS OFFICE	MS office latest full version (life time licenced)	MS office latest full version (life time licenced))	MS office latest full version (life time licenced)
MONITOR	Min. 24 inch full HD LED with antiglare protection	Min. 24 inch full HD LED with antiglare protection	Min. 24 inch full HD LED with antiglare protection
KEYBOARD AND MOUSE	YES,USB TYPE	YES,USB TYPE	YES,USB TYPE
CD/DVD WRITER	YES	YES	NO

MOC of piping shall be as under:

- ✓ Piping from existing aeration to proposed MBR Launder: HDPE
- ✓ Proposed MBR Launder to MBR Tank : SS304
- ✓ Piping from existing MBR to proposed MBR permeate tank : SS304
- ✓ Back pulse and permeate piping for proposed MBR : SS316
- ✓ Chemical piping for proposed MBR: Grey UPVC
- ✓ Air piping for proposed MBR : GI "C" Class
- ✓ Piping from MBR permeate tank to internal RO and permeate up to Permeate water tank: SS316. Where TDS is more than 20000 ppm, required MOC for piping, control valves and piping accessories shall be Duplex steel.
- ✓ Final reject water piping from the downstream of reject control valve to reject water tank and then final treated water tank : HDPE
- ✓ Sludge piping shall be HDPE

5. TERMS & CONDITION and PRICE FORMAT:

Terms and condition

Payment for RO water will be done After successful commissioning and outlet RO water testing parameter achieved as per testing of NABL Laboratory (testing shall be done by the bidder).

Bidder has to install 2 (two) No's flow meter (custody meter) for metering purpose of RO Product water. lowest out of two will be considered for payment (Difference in both reading should not be more than 3%, If variation is more than 3% it is required urgent calibration needed) and bidder has to calibrate flow meters at his own cost by reputed party at intervals of every 6 Months and that will be verified by Banas Dairy.

Bidder has to provide minimum 85% of total quantity of RO product water on Monthly as per rated RO product water quality. (30

days). In Event of not achieving 85% monthly rated quantity, Banas will imposed penalty to bidder on that monthly bill of remaining quantity same as water rate.

In the event of capacity & quality is not achieved as per the defined agreed parameter, Supplier to modify the plant to meet the defined agreed parameter, if not achieved after 30 days of operation after product out, Banas Dairy will reject plant and Bidder had to take back plant without any commercial claim.

The RO product water quality must conform as per Tender Parameters. Water quality will be periodically checked by third party NABL certified lab every month and the system should perform consistently (all necessary key parameters will be checked daily)

The record of treated water supplied to the plant shall be maintained by the bidder. The record should always be updated, legible and be produced for inspection as and when required also operation & maintenance record maintained by bidder and verified by Banas Dairy's representative.

During this agreement Banas Dairy will not pay and not be responsible for any issue/Breakdown/Preventive Maintenance/Equipment replacement of any natural climates etc.

If any breakdown occurs in power, air and steam at Banas Dairy battery limit then bidder will not be responsible for that.

General terms and condition:

The Supplier shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only as far as may be necessary for purposes of such performance

The Supplier shall not, without the Purchasers prior written consent, make use of any document or information enumerated in above Para except for purposes of performing the Contract.

Any document, other than the Contract itself, enumerated in above Para shall remain the property of the Purchaser and shall be returned (in all copies) to the Purchaser on completion of the Suppliers performance under the Contract if so required by the Purchaser.

The Supplier shall indemnify the Purchaser against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the Goods or any part thereof in India.

Delivery of the Goods and performance of Services shall be made by the Supplier accordance with the time schedule specified by the Purchaser in its Schedule Requirements.

If at any time during performance of the Contract, the supplier or its subcontractors should encounter conditions impeding timely delivery of the Goods & Performance of Services, the Supplier shall promptly notify the Purchaser in writing of the fact the delay, its likely duration and its cause(s). As soon as practicable after receipt the Suppliers notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension on shall be ratified by the parties by amendment of the Contract.

The Purchaser may, by written communication sent to the Supplier, terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the purchaser's convenience, the extent to which performance of work under the Contract is terminated, and the date upon which such termination becomes effective.

The Goods that are complete and ready for shipment within 30 days after the Suppliers receipt of notice of termination shall be purchased by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:

- a. To have any portion completed and delivered at the Contract terms and prices; and/or
- b. To cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and for materials and parts previously procured by the Supplier.

The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

If, after thirty (30) days from the commencement of such informal negotiations, the Purchaser and the Supplier have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified in the Special Conditions of Contract. These mechanisms include, but are not restricted to, conciliation mediated by a third party, adjudication in an agreed national or international forum, and/or international arbitration, the mechanism shall be specified in the Special Conditions of Contract.

This invitation for bids is issued for and on behalf of Banaskantha District Co-operative Milk Producers' Union Ltd. having its head office situated at Palanpur (Gujarat), for the settlement of any dispute arising out of the contract against this bid, only the Courts at Palanpur shall have jurisdiction.

If circumstances of Force Majeure have occurred and shall continue for a period of 182 days then, notwithstanding that the Supplier may by reason thereof have been granted an extension of Time for Completion of the Works, either party shall be entitled to serve upon the other 28 days' notice to terminate the Contract. If at the expiry of the period of 28 days Force Majeure shall still continue the Contract shall terminate.

If the Contract shall be terminated as aforesaid the Supplier shall be paid by the Purchaser for all work executed prior to the date of termination at the rates and prices provided in the Contract and in addition:

- a. The amounts payable in respect of any preliminary items, so far as the work or service comprised therein has been carried out or performed, and a proper proportion as certified by the Purchaser of any such items the work or service comprised in which has been partially carried out or performed.
- b. The cost of materials or goods reasonably ordered for the Works or for use in connection with the Works which shall have been delivered to the Supplier or of which the Supplier is legally liable to accept delivery (such materials or goods becoming the property of the Purchaser upon such payment being made by him).
- c. A sum, to be certified by the Purchaser, being the amount of any expenditure, which in the circumstances was reasonably incurred by the Supplier in the expectation of completing the whole of the Works, in so far as such expenditure shall not have been covered by the payments in this Sub-Clause before mentioned.
- d. The reasonable cost of removal under Sub-Clause b of this Clause and (if enquired by the Supplier) return thereof to the Supplier's works in his country or to any other destination at no greater cost.
- e. The reasonable cost of repatriation of all the Supplier's staff and workmen employed on or in connection with the Works at the time of such termination.

Provided always that, against any payments due from the Purchaser under this Sub-Clause, the Purchaser shall be entitled to be credited with any outstanding balances due from the Supplier for advances in respect of Plant and materials, and any sum previously paid by the Purchaser to the Supplier in respect of the execution of the Works.

Bids shall remain valid for **120 days** after the last date of receipt of bid prescribed by the Purchaser, pursuant to Clause 19. A bid valid for a shorter period shall be rejected by the Purchaser as non-responsive.

In exceptional circumstance, the Purchaser may prior to the expiry of initial validity period solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing (or by fax or email). A Bidder granting the request will not be required nor permitted to modify its bid.

The Bidder cannot modify or withdraw its bid after the bid's submission, provided that written notice of the modification or withdrawal is received by the Purchaser prior to the deadline prescribed for submission of bids.

No bid can be modified subsequent to the deadline for submission of bids.

No bid may be withdrawn interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid Form. Withdrawal of a bid during this interval may result in the Bidder's forfeiture of its bid security.

Price Break-up

The bidder shall also submit the itemized price breakup separately mentioning HSN code/SAC code, basic price, P&F, GST, Freight, Insurance, I&C, etc. as applicable which will be applicable for progressive payments. Items and works for which no break-up price is furnished by the bidder will not be paid for by the purchaser when supplied

/ executed and shall be deemed covered by the other break-up prices. Wherever items are mentioned in terms of length, prices should be quoted on per meter basis. However, for evaluation purpose, prices quoted as indicated in above only will be considered.

Wherever there is more than one item, unit rates should be indicated separately.

Any variation in taxes and duties during the delivery period shall be on the purchaser's account.

A supplier shall be entirely responsible for payment of all taxes, GST, duties, license fees, etc. until taking over of the works by the 'Purchaser'.

The Service Provider shall ensure transfer of all project assets to Banas Dairy or its successors or an agency as decided by the Banas Dairy after (Mentioned in table- Price format) from COD of project at zero cost and free from any encumbrance and liability. The transfer shall be completed within 90 days after (Mentioned in table- Price format) from COD of project failing which Banas Dairy shall be entitled to take over the project assets Suo moto.

The Contract Price payable on monthly basis shall be fixed during the contract period and no price variation on the same shall be payable during the contract period.

Confidentiality

The bidder shall keep confidential any information obtained from the Banas Dairy and shall not divulge the same to any third party without consent in writing by BANASDAIRY.

Publicity

The bidder shall not advertise or publicly announce that he is participating in EOI for BANAS DAIRY without written consent of BANASDAIRY.

Note to Bidders: On receipt of bid from various interested parties through this EOI, Banas Dairy shall study and evaluate the proposal. However, it shall be sole discretion of Banas Dairy whether to accept or reject the bid submitted by various interested parties.

Payment terms:

Service water shall be made available free of cost.

Power cost shall be borne by the supplier and shall be calculated as per Monthly electricity bill of DISCOM.

Air cost shall be borne by the supplier and shall be calculated as per air generation cost.

Steam cost shall be borne by the supplier and shall be calculated as per steam generation cost.

100% payment at the end of every month after satisfactory supply of RO water. Bidder has to raise the bill at the end of every month.

No advance payment will be given against bank guarantee.

No Finance will be given. 100 % finance will be done by bidder.

Price Format for BOO:

Sr. no.	Period	Item Description	Unit	Amount (Including all) (INR) (except GST)
1	Up to 10 years	RO Water supply price	Rs./1000 Liter	
2	Up to 15 years	RO Water supply price	Rs./1000 Liter	
3	Up to 20 years	RO Water supply price	Rs./1000 Liter	
4	Up to 25 years	RO Water supply price	Rs./1000 Liter	

Note: GST shall be extra as actual

Price Format for BOOT:

Sr. no.	Period	Item Description	Unit	Amount (Including all) (INR) (except GST)
1	Up to 10 years	RO Water supply price	Rs./1000 Liter	
2	Up to 15 years	RO Water supply price	Rs./1000 Liter	
3	Up to 20 years	RO Water supply price	Rs./1000 Liter	
4	Up to 25 years	RO Water supply price	Rs./1000 Liter	

Note: GST shall be extra as actual

Price:

Price submitted shall be FOR Banas Dairy and its site inclusive of all taxes, GST, duties, insurance, transportation, O & M, consumables etc.

6. BATTERY LIMITS: Scope of work

S. N.	Description	Purchaser's scope	Bidder's scope
1	Service water	Service water header shall be available in ETP Plant campus. Service water shall be made available free of cost.	Distribution to all the consumption point for MBR and RO plant as per the requirement. Bidder has to tap with isolation valve and flow meter from the common header of hydro flow RO line for surface cleaning and chemical preparation.
2	Electricals	Single out going feeder (3-phase 415 volt) shall be available at PCC in the Substation of Banas –I Dairy plant.	Bidder scope shall be from PCC to IMCC and IMCC to all individual loads for the MBR, RO plant and accessories. Cabling for all instruments, flow meter, sensors etc. are covered in the work scope. The junction box and the electrical connection. The scope

			<p>includes supply and installation of IMCC, controls, cables etc. and submission of documents approval for electrical installation executed by the bidder.</p> <p>There shall be separate energy meter for MBR and RO plant. For the measurement of power there shall be 3 phase energy meter and energy meter should be tested in the reputed lab of DISCOM.</p>
3	RO Plant inlet water	<p>There shall be two inlets. One shall be available at the outlet of 1.6 MLD MBR. Another shall be available at the outlet of 3.5 MLD Aeration tank. These water shall be free of cost</p>	<p>Bidder has to tap from the existing 1.6 MLD MBR to permeate tank. For 3.5 MLD outlet bidder has to install MBR in between existing aeration and proposed MBR permeate water tank. Bidder scope shall start from the individual outlet of aeration. Required piping, piping header with fittings, valves and supports shall be in the scope.</p> <p>Bidder has to make by pass connection with required isolation valves for secondary clarifier between existing aeration and MBR.</p> <p>The arrangement should be such that by changing the valve effluent can be diverted from MBR to existing secondary clarifier and vice versa.</p>
4	RO Plant outlet water (permeate)	<p>Tapping from the common header near proposed hydro flow system at RO Plant. Further distribution of treated RO water. Purchaser will pay amount on the RO treated water.</p>	<p>Bidder has to make common header in the hydro flow system.</p> <p>Tapping with isolation valve from the common header shall be in the scope of purchaser. Flow meter for qty. measurement shall be after hydra flow pump.</p>
5	Reject water	<p>Final treated water tank available. Further distribution from this tank.</p>	<p>Reject water shall be transferred up to Purchaser final treated water tank as mentioned in tender and subsequent clarification.</p>
6	Earthing		<p>Excavation of Earthing pits and earthing for MBR, RO Plant panels, instrument earth, and grid for electrical equipment in the scope of supply. Bidder has to provide precast earth pit for all the earthings.</p>
7	Civil work	<p>Only open land will be provided</p>	<p>Necessary steel supports/cable trays etc. for piping/ducting and cabling is in bidder's scope. Supports for piping, ducting, and platform for piping header in the scope. All necessary bolts/nuts, templates for equipment & machinery</p>

			<p>etc. all types of ladders, grit type platforms and GI hand railing in the RCC tanks, platforms for MBR, RO plant. Insert pipes in the tanks and internal piping in the tank.</p> <p>Construction of the control room, IMCC room, shed for RO Plant equipment, Underground RCC water tanks, equipment foundations based on the details provided by the equipment bidder. Earthing pits. RCC Water tanks as provided detail in tender and subsequent clarification.</p>
8	Compressed Air piping	Compressed air shall be made available Near ETP plantas mentioned in tender and subsequent clarification.	Compressed Air shall be drawn from the available header with required valve and flow meter for the instrumentation of MBR and RO plant equipment.
9	Steam for ACF	3 kg / cm2 pressure Steam shall be made available Near ETP plant	Shall tap with isolation valve and flow meter for steam sanitization activated carbon filter
10	Raw materials & Consumable		All consumables like chemicals, Gear oils, lubricants, packing for flanged joints etc. and spares required if any, for installation, testing & commissioning and till BOOT contract.
11	Automation	Integration of Central PLC (dairy plant) with ETP PLC and cable connection to ETP control room PLC	For all machines /equipment's in the scope of supply up to PLC & control desk in RO plant control room. SCADA and PLC shall be capable to integrate the PLC of Existing ETP plant and central PLC of dairy plant also.
12	Statutory requirement		Statutory approval will be carried out by purchaser. However, Document require for the approval shall be provided by bidder.

7. List of preferred Makes of Bought out Items (Not in order of preference)

DESCRIPTION	MAKES
ROTARY SCREEN	JASH ENGINEERING/VOLTAS/HUBER/AURIC
PH CORRECTION SYSTEM	E&H /EMERSON / YOKOGAWA
ROOT BLOWER	EVEREST / USHA/ATLAS COPCO /TMVT/KAY
CENTRIFUGAL EFFLUENT PUMP	JOHNSON/ KIRLOSKAR
SUBMERSIBLE EFFLUENT PUMP	SULZER / GRUNDFOSS / ABS
MEMBRANE BIO REACTOR (MBR)	SUEZ (VEOLIA)/ MITSUBISHI /TORREY/DUPONT/SUPRATEC
ON LINE COD METER	ORBIT TECHNOLOGIES / WTW- XYLEM GERMANY/E&H/JUMO
HDPE FITTINGS	DURAFUSE/INNOGAZ/FRIATEC / +GF+
ULTRA SONIC LEVEL SENSOR AND CONTROLLER	E & H / SIEMENS / EMERSON
DIAL TYPE THERMOMETERS	WIKA/ WAREE/BAUMER/JUMO / FORBES MARSHALL
TEMPERATURE SENSORS AND DIGITAL INDICATORS/ CONTROLLERS/ RECORDERS	YOKOGAWA/ TATA HONEYWELL/ E & H / GIC
SIGNAL & INSTRUMENT CABLE	LAPP KABEL / POLYCAB / CONCAB / ESBEE
TEMPERATURE SENSORS / DIGITAL INDICATOR / CONTROLLER / RECORDER	YOKOGAWA / TATA HONEYWELL / RADIX / E & H / EMERSON /
IP 55 BOXES FOR MOTOR ISOLATORS, PUSH BUTTONS, JUNCTION BOXES ETC.	HENSEL / HANSU / BCH
METERING PUMP FOR PH CORRECTION	GRUNFOS/ DOSMATIC / SWELORE/ PROMINENT / MILTON ROY
AIR BLOWER	EVEREST / USHA/ATLAS COPCO /TMVT/KAY
AIR COMPRESSOR	ELGI / IR /ATLAS COPCO
CHEMICAL DOSING PUMP	GRUNFOS / PROMINENT / MILTON ROY
RO MEMBRANE	DUPONT / TORREY / SUEZ (VEOLIA)
HDPE TANK	SINTEX / NATIONAL
SPIRAL WOUDED HDPE TANK	REPUTED SUPPLIER
UV SYSTEM	ALFA / BIOUV-TRIOGEN /ATLANTIUM/XYLEM
RO Feed /booster/high pressure pump	GRUNDFOSS/KSB/KIRLOSKAR/CRI

Water, sludge, effluent pumps (Except RO pump as above)	GRUNDFOSS/KSB/KIRLOSKAR/CRI/JHONSON
VERTICAL WATER PUMPS	GRUNFOS / KSB
HORIZONTAL WATER PUMP	GRUNFOS / KSB/ KIRLOSKAR
ACTUATOR / SOLENOID VALVE	FESTO/ EI-O-MATIC / BRAY / TURCK / ROTEX
SS BUTTERFLY VALVE	INTERVALVE/DELVAL/L&T/SAUNDERS/BDK
HDPE ELECTRO FUSION FITTINGS	DURAFUSE / INNOGAZ/FRIATEC / +GF+
MICRON CARTRIDGE FILTER	AMIAD/MAGNA/EQUIVALENT
Laboratory glassware, Chemical & instrument	
DIGITAL INSTRUMENT	HATCH
CHEMICALS	S D FINE / MERCK / FISCHER
INSTRUMENTATION, CONTROLS & AUTOMATION	
DESCRIPTION	MAKES
PLC SYSTEM / DCS SYSTEM / AUTOMATION	SIEMENS / SCHNEIDER / ROCKWELL (ALLEN BRADLEY)
HMI	SIEMENS/DANFOSS/ALLEN BRADLEY
VFD	DANFOSS / SIEMENS / ROCKWELL
LEVEL TRANSMITTER & INDICATOR	E&H/EMERSON/BAUMER/IFM/JUMO/PUNE TECHTROL/ANDERSON NEGELE
TEMPERATURE / PRESSURE TRANSMITTER	E&H / EMERSON / SIEMENS/BURKET/BAUMER/IFM/RADIX/JUMO//ANDERSON NEGELE/WIKA/WAREE
CONDUCTIVITY & PH TRANSMITTER	E&H / EMERSON / METTLER/BURKET/YOKOGAWA/JUMO
DENSITY TRANSMITTER	E&H / ANTON- PARR/EMERSON / YOKOGAWA /SIEMENS
RTD	E&H / EMERSON / SIEMENS / BAUMER/ANDERSON NEGELE/ WIKA/RADIX
PID CONTROLLER	EMERSON / YOKOGAWA / FOXBORO /BURKET/ HONEYWELL /FORBES MARSHAL /RADIX
FLOW SWITCH	DANFOSS / SWITZER / IFM / HONEYWELL / BURKET/JOHNSON/BAUMER/ANDERSON NEGELE
PHOTOCELL WITH REFLECTOR	LEUNZE / IFM/P&F
LEVEL SWITCH (FLOAT TYPE & VIBRATING FORK TYPE)	E&H / EMERSON / SIEMENS/BURKET/BAUMER/ANDERSON NEGELE/PUNE TECHTROL
VORTEX / MAGNETIC FLOW METER	E&H / EMERSON / SIEMENS/HONEYWELL/KROHNE MARSHALL/ YOKAGAWA
MASS FLOW METER	E&H / EMERSON / SIEMENS / YOKAGAWA/ANTON-PARR
CONTROL VALVE	SAMSON/BURKET/FORBESH MARSHALL
PRESSURE SWITCH / TEMP. SWITCH/THERMOSTAT	DANFOSS/ HANSEN / PARKER/BURKET/BAUMER / ANDERSON NEGELE/P&F/SWITZER/ INDOSS/

PRESSURE & TEMPERATURE GAUGE	WIKA/ WAREE/BAUMER/JUMO / FORBES MARSHALL
DUAL TYPE PRESSURE / TEMP GAUGES	WIKA/ WAREE/BAUMER/JUMO
LOAD MANAGER / POWER / ENERGY MONITOR	SIEMENS / ABB / ROCKWELL/SCHNEIDER
PC (PERSONAL COMPUTER)	HEWLETT-PACKARD/IBM / DELL
ELECTRICALS	
DESCRIPTION	MAKES
ELECTRIC MOTORS	SIEMENS / ABB
AIR CIRCUIT BREAKER	L&T / SIEMENS / SCHNEIDER/ABB
MCCB	L&T / SIEMENS / SCHNEIDER/ABB
CONTACTORS	L&T / SIEMENS / SCHNEIDER/ABB
STARTER OVERLOAD RELAYS	L&T / SIEMENS / SCHNEIDER/ABB
INTELLIGENT MOTOR PROTECTION RELAYS	SIEMENS / ROCKWELL / L&T / SCHNEIDER
TIMERS ELECTRONIC	L&T / SIEMENS / SCHNEIDER/ABB
MCBS	L&T / SIEMENS / SCHNEIDER/ABB
PUSH BUTTONS	TEKNIC / L&T / SIEMENS/ABB
INDICATING LAMPS (LED)	TEKNIC / L&T / SIEMENS/ABB
DIGITAL AMMETER & VOLTMETER	CONZERV / MECO / HPL SOCOMEC / L&T / SIEMENS
ANALOG AMMETER & VOLTMETER	RISHABH / IMP / MECO / AE
DIGITAL ENERGY METER	SIEMENS / ABB / ROCKWELL / SCHNEIDER
PVC CONDUIT & ACCESSORIES	PRECISION / CLIPSAL / P - PLAST / POLYCAB
POWER FACTOR METER	L&T / IMP / MECO / AE / CONZERV
PROGRAMMABLE PROTECTION RELAY	MINILEC / CONZERV / L&T / SIEMENS / SCHNEIDER
CURRENT TRANSFORMER	KAPPA / MECO / AE / IMP / INDCOIL
LT POWER CABLES (COPPER) FROM IMCC TO VARIOUS CONSUMPTION POINTS.	LAPP /CONCAB/SBEE
LT COPPER CONTROL CABLES	LAPP /CONCAB/SBEE
SIGNAL & INSTRUMENT CABLE	LAPP /CONCAB/SBEE
LT POWER CABLES (ALUMINIUM) FROM PCC TO IMCC/POWER DISTRIBUTION BOARD	POLYCAB / HAVELLS / KEI / FINOLEX
POWER CAPACITORS	EPCOS / SCHNEIDER / SIEMENS / L&T
APFC RELAY	BELUKE / EPCOS / L&T / PHASITRON

CABLE TRAY	INDIANA / MEK / PILCO / ELCON / METALICA PRESSINGS / POWER CONTROLS / SILVER LINE
ISOLATING SWITCHES	L&T / SIEMENS / SCHNEIDER
HRC FUSES	L&T / SIEMENS / EE / C&S / BUSMANN / GE POWER
PLUG & SOCKET	SCHNEIDER / LEGRAND / CLIPSAL / BCH / HENSEL
TERMINAL BLOCKS	WAGO / CONNECT WELL / ELMEX
ROTARY SELECTOR SWITCH	KAYCEE / SALZER / L&T / SIEMENS
CABLE GLANDS	COMMET / EX-PROTECTA / DOWELS / BRACKO
CABLE LUGS	DOWELS / COMMET
MECHANICAL INTERLOCK	L&T / SCHNEIDER / ABB / SIEMENS
ELECTRONIC SOFT STARTER	DANFOSS / SIEMENS / ROCKWELL (ALLEN BRADLEY)
SERVO VOLTAGE STABILIZER	APLAB / NEEL / CRYCARD / DB ELECTRONICS / PRIMA / NUMERIC
UPS	APC / EMERSON / NUMERIC / REILLO / SIEMENS / HI-REL / APLAB
SMF BATTERY	YUASA-ROCKET / EXIDE
LITHIUM ION BATTERY	SAMSUNG / LG / PANASONIC
CABLE JOINT KIT	3M / RAYCHEM-RPG
PVC INSULATED TAP	ANCHOR / STILL GRIP
LIGHT FIXTURE LED	PHILIPS / WIPRO
EXHAUST FAN	CROMPTON / ALMONARD
CHEMICAL TYPE EARTHING	NATIONAL /EQUIVALENT
RUBBER MAT	JYOTI / VARDHAN / RAYCHEM RPG
BOXES FOR MOTOR ISOLATORS, PUSH BUTTONS, JUNCTION BOXES ETC.	HENSEL / HANSU / BCH
VALVES & PIPES (MS, GI, HDPE, UPVC)	
DESCRIPTION	MAKES
WATER VALVES (BUTTERFLY / BALL)	AUDCO / SAUNDERS / INTERVALVE / BDK / L&T / DELVAL
WATER VALVES (DIAPHRAGM)	SAUNDERS / BDK / L&T
NON-RETURN VALVE FOR WATER	AUDCO / INTERVALVE / BDK / L&T
WATER FOOT VALVE	KIRLOSKAR / GG / LEADER
GI PIPES FOR WATER, CHILLED WATER & AIR	TATA / JINDAL
MS PIPES FOR STEAM.	TATA / JINDAL / KALYANI / MSL
MS PIPES FOR GYCHOL	TATA / JINDAL / KALYANI / MSL
NRV FOR AIR / OIL LINE	INTERVALVE / AUDCO / LEADER / L&T
SOLENOID VALVE FOR WATER LINE	DANFOSS / AVCON / ROTEX / BURKERT / FESTO

GLOBE VALVES (FOR HOT WATER , STEAM)	AUDCO / SPIRAX / ARMSTRONG, USA / BDK / L&T
GREY UPVC PIPE	ASTRAL / FINOLEX
HDPE PIPE	NOBEL / DUTRON
SS PIPES & VALVES	
DESCRIPTION	MAKES
SS PIPES	RATNAMANI / BHANDARI FOILS & TUBES / APEX TUBES
SS SEAT TYPE PNEUMATIC VALVES	GEA TUCHENHAGEN / ALFA LAVAL / SPX
PNEUMATIC SS BUTTERFLY / BALL TYPE VALVES	GEA TUCHENHAGEN / ALFA LAVAL / SPX
SS MANUAL VALVES & FITTINGS	ALFA LAVAL / IDMC / SPX
AIR COMPRESSORS & AIR LINE FITTINGS	
DESCRIPTION	MAKES
AIR LINES ACCESSORIES	FESTO /SHAVO NORGEN / LEGRIS / NUCON / SMC / PARKER
AUTO DRAIN VALVE	ULTRA FILTER / ZANDER/HYDINT
MISCELLANEOUS ITEMS	
DESCRIPTION	MAKES
GEARED MOTOR / GEAR BOX	SEW/PBL / ELECON / IC BAUER/ BON FIGLIO
HOT WATER-WATER MIXING BATTERY	SPIRAX / ARMSTRONG, USA
STRUCTURAL STEEL	SAIL / TISCO / ESSAR
APT CONDENSATE PUMP	SPIRAX MARSHALL / ARMSTRONG
MONORAIL /CHAIN PULLY BLOCK	MMORRIES / INDEF / BRAD / VGOR
ANCHOR FASTNER	HILTI / 3M
DESCRIPTION	MAKES
HOT INSULATION (LRB)	LLOYD / UP TWIGA / ROCKWOOL
COLD INSULATION	ARMAFLEX / BEARDSHELL / LLOYD / HITLIN / FRICK
SANDWITCH PANEL INSULATION FOR COLD ROOMS	JINDAL MECLEC/LLOYDS / BEARDSSELL
SADDLES FOR COLD INSULATION	SUPERTHERM (LLOYDS) / BEARDSSELL
ALUMINIUM CLADING SHEET	HINDALCO / BALCO