

**INVITATION FOR EXPRESSION OF INTEREST
FOR
DESIGN, ENGINEERING, MANUFACTURE, SUPPLY,
LABOUR JOB
AND
INSTALLATION, TESTING AND COMMISSIONING
OF
KHOA MAKING & PACKING PLANT ON TURNKEY
BASIS
AT
BANAS DAIRY, SANADAR, GUJARAT**



REF: BNS/PROJECT/SAN/KHOA



BANASKANTHA DISTRICT CO-OP.MILK PRODUCERS' UNION LTD.
BANAS DAIRY, PB NO 20, PALANPUR -385001,DIST : BANASKANTHA,
GUJARAT PHONE : 253881-85..FAX : 02742-252723

Ref: BNS/PROJECT/SAN/KHOA

28/01/2021

INVITATION FOR EXPRESSION OF INTEREST

Banas Dairy invites technical Expression of Interest from reputed agencies for Design, Engineering, Manufacture, Supply, Labour Job and installation, testing and commissioning of 20 MTPD automated KHOA making & Packing Plant on turnkey basis at its Green field dairy & Potato processing plant at SANADAR, Taluka: Deodar, District: Banaskantha ,Gujarat. Interested, Technically and financially competent agencies having sufficient experience to undertake such work may visit Banas Dairy, Palanpur to understand technical details and scope of work before submitting their proposal.

Indicative detail for the work may be obtained from above mentioned address during office hours. Same may also be downloaded from our website www.banasdairy.coop . Technical details in sealed covers shall be submitted at the above given address by 20th February 2021 up to 17.00 hrs. Banas dairy at its sole discretion and without assigning any reason thereof, also reserves the right to accept any/or reject any or all technical proposal.

I/C MANAGING DIRECTOR



BANASKANTHA DIST. COOPERATIVE MILK PRODUCERS' UNION
LTD., PALANPUR : 385 001
(Banas Dairy, Palanpur)

Ref: BNS/PROJ/SAN/KHOA

28.01.2021

DETAIL WITH NOTICE FOR INVITATION FOR EXPRESSION OF INTEREST

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

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|-----------|--|
| Section 1 | Introduction of Banas Dairy |
| Section 2 | General Instructions |
| Section 3 | Terms and Conditions |
| Section 4 | Technical specifications & Scope of supply |

1. INTRODUCTION:

Banaskantha District Cooperative Milk Producers' Union Limited known as Banas Dairy is a cooperative organization established in the year 1969 under the Gujarat Co-operative societies Act 1961. Dairy having its independent operation in the District of Banaskantha located about 140 KM north to Ahmedabad on NH14. The Processed milk and milk products are manufactured under brand name of Amul, Sagar and are marketed by Gujarat Co-operative Milk Marketing Federation Ltd. (GCMMF) throughout the country & abroad. The Banas Milk Union , having turnover of over Rs 12000 Crores plays a major role in procurement of milk from rural areas through dairy co-operative societies.

Banas Dairy, Palanpur is setting up a new Green Field dairy plant of capacity 30 LLPD expandable up to 50 LLPD with all required Utilities at village: Sanadar, Taluka: Deodar, Banaskantha District, about 100 KMs from Palanpur.

The plant shall have following facility:

Liquid milk Plant	30 LLPD (Expandable up to 50 LLPD)
White/ Table Butter Manufacturing	80 MTPD
Khoa Manufacturing facility	20 MTPD
Ice Cream Manufacturing facility	70KLPD (Expandable up to 100 KLPD)
Potato product manufacturing facility	3 MT/hr

2. GENERAL INSTRUCTIONS

General instructions are specified in the following paragraphs. Please note that the instructions/terms and conditions presented are indicative in nature and not exhaustive. Bidder should read the instructions mentioned carefully and include these aspects in the proposal.

Bidder shall submit complete proposals along with all the required and other relevant information in sealed envelope. Complete Technical bid should be sealed in one envelope. Last date for submission is 20th Feb 2021 before 1700 hours at Banas Dairy, P.O. box 20, Palanpur 385 001. The technical offer shall be sent to

Sr. Gen. Manager (P&E)
Banas Dairy
Palanpur : 385001
Banaskantha
Gujarat

2.1 Technical Bid

- The bidder shall provide complete process write up with P&ID, Layout ,Space requirement, Utility consumption, process parameter ,Quality parameter, List of equipment and various makes of bought out items with technical bid.
- Technical bid should be organized strictly in the same manner and order as mentioned in this document. Information requested under section is the minimum information bidder needs to provide. In addition to this, Bidder should also include any other required relevant information.

2.2 Information regarding Bidder

At least following information, shall be provided with the proposal:

- Turnover and PL A/c for the last three financial years
- Sector clients
- No. and locations of offices in India
- Contact Person(s) authorized to deal on behalf of the company
- Key Personnel
- Details experience in handling similar projects
- A list of detailed references concerning similar project that have been executed
- Details regarding your quality policy
- ISO 9000 compliance or equivalent standards
- Project management skills

3. TERMS AND CONDITIONS

3.1 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 BANAS DAIRY .

3.2 Publicity

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

Note to Bidders: On receipt of technical details from various interested parties through this EOI, Banas Dairy shall study and evaluate the proposal and if required shall call the parties for technical discussions. If the solution proposed by the interested parties is found to be satisfactory to Banas Dairy, then only Banas Dairy Shall may float the tender inviting technical and commercial offer. However, it shall be sole discretion of Banas Dairy whether to accept or reject the technical proposal submitted by various interested parties and to float or not the tender inviting commercial bids.

4. Technical Specifications & Scope of supply :

The various sections comprising technical specifications are:

SCHEDULE - I	Design Basis & Process Description
SCHEDULE - II	Technical Specifications
SCHEDULE - III	Battery Limits

SCHEDULE - I: DESIGN BASIS AND ASSUMPTION

The scope of work includes:

- a) Standardized Milk receipt at Milk Formulation tank, formulation & transfer to an evaporator.
- b) Sugar syrup preparation & storage
- c) Milk concentration plant(evaporator) suitable for KHOA
- d) Condense milk storage.
- e) 1*1000 kg/hr or 2*500 Kg/hr Continuous KHOA making unit/s.
- f) Centralised CIP system.
- g) KHOA packing system.
- h) Automation of the entire KHOA making plant with all third party integration inside the KHOA plant including KHOA packing equipment.
- i) Automation interfacing/connectivity facility with existing liquid milk plant automation system shall be provided for receiving milk in milk formulation tank of KHOA plant.
- j) MIS Report generation for the entire KHOA Making & Packing Plant with interfacing/connectivity facility with centralized MIS of LMP on a common platform. (to be provided in coordination with LMP contractor, Interfacing work would be carried out by LMP contractor)

Project Information:

Project Authority	Managing Director,
	Banaskantha District Co-operative Milk
	Producers' Union Ltd., Palanpur.
Site Address	Banas Dairy
	Village : Sanadar
	Taluca: Deodar
	District : Banaskantha
Nearest Railway Station	Palanpur
Nearest airport	Ahmedabad
Nearest City	Deesa

Tentative Process for KHOA manufacturing:

The Khoa making and Packing plant shall be designed to manufacture Pindi/Dhap/Danedar Khoa , 20MTPD @1MTPH during 20 hrs operation

The plant shall also be able to produce the Sweetened Khoa at 1 MTPH for 20 hours of continuous operation.

Standardized Pasteurized Milk of 13 % TS shall be supplied by Purchaser at 4 deg C at valve battery of 2*25 Kl milk formulation tanks. Milk shall be pumped from these silos to Milk Evaporator for concentration from 13 % initial TS to 48 % TS through TVR based Falling Film single/Multistage Evaporator. Same Plant shall be able to Concentrate Standardized Pasteurized Milk with addition of sugar for Sweetened KHOA Manufacturing (13 % + 9% sugar) 22 % initial TS to 55 % TS. 2*3 Kl Sugar syrup preparation & storage tank shall be provided. Sugar syrup after filtration shall be added in milk formulation tank.

The concentrate shall be stored in insulated tanks - 02 Nos x 5 KL capacity. The tank shall be conical bottom design with agitator and all the standard accessories.

The heated concentrate of 45% TS shall then be transferred in to 02 Nos insulated product intermediate conditioning tanks. The tanks shall be used for addition of citric acid and /or other ingredients as may be required. Two tanks are provided to ensure that one tank is hooked up to Khoa processing module while other tank is under filling /conditioning process.

In case of exigency the concentrate shall be cooled to less than 10 deg C through double section PHE type chiller. The concentrate of 54 Deg C shall be cooled to 32 deg C through cooling tower water and further to less than 10 deg C by chilled water. The stored concentrate shall be heated to the 55 deg C with hot water generated through steam .The heater can be shell & tube design or PHE type. The capacity of the heater shall be about 3000 Kg/ Hr.

The product from the conditioning tanks shall be pumped to a continuous scrapped surface heat exchanger (under vacuum) complete with necessary accessories for removal of vapour after condensing. The TS of the final product from the scrap surface heat exchanger may be 70%.

The product is further cooled under suitable vacuum chamber or in trays kept in the suitable cooling chamber. Bidder may also propose other alternate hygienic solution for continuous/batch Khoa cooling. The system proposed should be CIP cleanable with least manual intervention.

The final product shall be further suitably conveyed, packed (pouch /Thermoforming) in 200 g, 500 g, 1 kg and then packed in Cartoon .Khoa shall also be packed in 12 Kg bucket and stored in cold rooms.

The Final product KHOA shall confirm to the following standards:

	Characteristic	Requirement for KHOA		
		Pindi	Danedar	Dhap
1	Total solids % by mass minimum	65	60	55
2	Fat ,% by mass on dry basis, Minimum	37	37	37
3	Total Ash, % by mass(on dry basis) maximum	6	6	6
4	Titration acidity (as lactic acid),% by mass maximum	0.8	0.9	0.6
5	Coliform count/g maximum	0	0	0
6	Yeast & mould counts/g maximum	0	0	0

SCHEDULE – II: Technical specification

The KHOA Plant shall comprise of the following sections:

1.0	Milk formulation
1.1	Storage of pre-standard milk, preparation of sugar solution, mixing of sugar solution in milk storage tanks, and transferring milk to balance tank of multistage TVR evaporator.
2.0	Evaporation plant
2.1	1 set of multistage falling film evaporation plant using one suitable TVR system to achieve 48%TS
2.2	Steam condensate recovery system
2.3	Product vapour collection system
3.0	Khoa making unit and Cooling unit
4.0	Khoa Packing machines
5.0	Centralized CIP system
6.0	Instrumentation & automation controls
7.0	Electrical distribution system
8.0	Services & utilities

1. MILK FORMULATION

The Standardized & Pasteurized milk at maximum 13 % TS shall be transferred to milk formulation section and shall be kept in 25 KL silo. Sugar solution of 50% concentration is prepared and dosed to milk kept in 25 KL silo in right proportion for formation of 22 % TS in feed.

The milk silo shall be emptied out within 4 hours of evaporator working. By this time next batch of formulated milk shall be made for uninterrupted processing.

SUGAR SYRUP PREPARATION SYSTEM

Initially the predetermined quantity of RO WATER at 25-35 deg. C. (through LT of Sugar preparation tank) taken to sugar syrup preparation (storage-cum-recirculation) tank. The milk shall be circulated through PHE heater (Δt 20^o C) in

storage-cum-recirculation tank. Ro water will be heated to 65-70^o C by circulating through the PHE heater & Sugar Syrup preparation tanks for required duration while adding predetermined quantity of sugar through the tri-blender hopper. Final Sugar Syrup TS would be up to 50%.

Once the required sugar conc. is reached and batch is prepared, it shall be stored in any of 2*3 kl sugar syrup storage tank after passing through a filter press (3 - 5 micron).

Filtered sugar syrup shall be dosed to any of 2 x 25 KL Milk formulation tank in required quantity.

CIP of Sugar syrup preparation cum storage tanks with transfer lines shall be done from centralised CIP kitchen .

2. TVR EVAPORATION PLANT

General design parameters of falling film multistage TVR evaporation plant:

Sr. No.	Parameter	Units	Plain KHOA *Indicative	Sweetened KHOA *Indicative
1.	Feed rate	Kgs/hr	6000	Bidder to provide
2.	Feed Concentration	% TS	13%	22%(13% milk TS + 9%sugar)
3.	Feed temperature	°C	4-10	4-10
4.	Water evaporation	Kgs/hr	4400	Bidder to provide
5.	Concentrate flow rate	Kgs/hr	1600	Bidder to provide
6.	Product concentrate	% TS	48	55
7.	Product temp (Indicative)	°C	56	56

8.	Condenser		Detail to be provided by Bidder
9.	Water inlet temperature to condenser	°C	
10.	Cooling system		
11.	Pre heater		
12.	Boiling temperature		

Indicative data shall be revised by the designer to optimize the plant capacity as main design product shall be Plain Khoa.

- a) The Evaporation plant comprises of Calandrias, Vapour separators, Dead vapour preheater, Temperature treatment holder, Inline filter, Thermal vapour re-compressor & Surface condenser.
- b) The plant operation with proper tube wetting rates ensures the continuous operation of 20 hours without requiring CIP and with no re-circulation.
- c) The product (milk) from balance tank is pumped through dead vapour preheater where the incoming milk is heated by the vapour from the last effect.
- d) After partial heating of milk in dead vapour preheater (DVH), milk is heated in Pre-heaters (82- 86°C) by vapour from 2nd and 1st effect. It shall be further heated to Pasteurization temperature (115 – 126 °C) by High heaters (DSI) and then held at this temperature in holding tube for pre-determined time.
- e) Heated milk is then directly introduced in effect I for evaporation. Vapours generated in 2 effect are partly recycled to finisher jacket after compression by high pressure steam in TVR and partly in Dead Vapour Preheater by milk coming from Feed balance tank and remaining vapours are condensed in Surface condenser by cooling water. Finally vapours generated in finisher are condensed in effect 2.
- f) Final condensed milk is achieved pumped out by concentrate discharge pump.
- g) Vacuum in the plant is established by double stage vacuum pump. A surface condenser is provided for condensation of vapours from dead vapour preheater.

Design shall be based on following product & utilities to be provided by the Purchaser

Milk quality	Milk passing clot-on-boil test.
Steam	Min 98 % dry, free from foreign matter/chemicals
Water	Soft water and RO water
Electricity	415 V+5%, 50+3% Hz AC supply.

All parts coming in contact with product & CIP solution shall be in Stainless Steel AISI 304. All internal weld joints coming in contact with the product and for un-insulated external surfaces shall be ground to 150 grit and other weld joints shall be left un-ground. External and internal surface finish shall be retained as original mill finish up to the extent possible. All welds for the process lines and equipment shall be by TIG welding only.

STEAM CONDENSATE RECOVERY SYSTEM

A suitable steam condensate recovery system shall be provided with suitable capacity insulated tank, pumps, valves & controls to receive condensate from all sections. The clean condensate from the tank shall be pumped to the boiler feed tank and excess shall be used as CIP make up water or during plant start up water or for floor cleaning.

PRODUCT VAPOR CONDENSATE RECOVERY SYSTEM

A suitable product vapor condensate recovery system shall be provided with suitable capacity recovery tank, pump, valves & controls to receive condensate from all places. The murky condensate shall be drained off. The clean condensate from the tank shall be pumped to the suitable design system to use condensate as CIP make up water or during start up water or for floor cleaning.

3. KHOA making unit :

Khoa making unit may consists of following equipment

- a) Scraped surface heat exchanger particularly suitable for concentrated viscous, stick and heat sensitive heat product. It may consist of suitable cylinder with drive unit. Rotor and scraper blades with staggered configuration to prevent product channeling. The heating surface is to be made of stainless steel AISI 316 L honed to very high finish on the inner surface. The scrapping blades are made out of hardened ground stainless steel or other suitable material.

The general design parameters of scrapped surface heat exchanger shall be as below:

Sr. No.	Parameter	Units	Plain KHOA Design	Sweetened KHOA *Indicative
1	Feed Rate	Kgs/hr	1600	Bidder to mention
2	Feed concentration	% TS	48	55
3	Evaporation rate	Kgs/hr	Bidder to mention	Bidder to mention
4	% TS at outlet	% TS	Bidder to mention	Bidder to mention
5	Product temp at outlet	Deg C	Bidder to mention	Bidder to mention
6	Inlet steam Pressure . to SSHE (Indicative)	Kg/cm 2	Bidder to mention	Bidder to mention

b) Vapour separator

The separators shall be placed in front of the scrapped surface heat exchanger to separate the vapor from the entrained feed and will be provided with light/sight glass assembly, manhole, CIP spray balls connected to the pressure side of the feed pump.

c) Khoa cooling unit

Khoa coming out from SSHE shall be transferred through suitable Pump to Khoa cooling unit.

Bidder to provide the detail of suitable Khoa cooling unit.

All parts in contact with the product, except for gaskets, shall be stainless steel AISI 304. Internal surfaces in contact with product shall of finish 2B. The welds shall be ground to 180grit. External surfaces shall be of 2B/2D finish and the welds shall be left ungrounded.

4. Khoa Packing Machines

The final product shall be further suitably conveyed, packed (pouch /Thermoforming) in 200 g, 500 g, 1 kg and then packed in Cartoon .Khoa shall also be packed in 12 Kg bucket and stored in cold rooms.

Bidder to suggest technical detail of packing machines with accurate filling (by weight) in thermoforming machines.

5. CIP SYSTEM

One set of centralized CIP kitchen shall be provided.

A well-designed typical dairy standard automated Clean-In-Place (CIP) system shall be provided for entire Khoa Palnt . CIP station shall have minimum two numbers of circuits. All the pipe lines and storage equipments shall be cleaned on each emptying if the gap is more than one hour before handling of next product. Each route shall have different flow, temperature and time duration set point and operator can change this recipe configuration from man-machine interface with use of password facility.

It shall be designed for maximum recovery of CIP solution, milk and water using conductivity transmitter on CIP return lines. CIP chemicals shall be dosed in CIP tanks automatically as per set points given by operator. All CIP operations shall be carried out from control station. Status of each program for particular route is available on human-machine interface. All the drains from CIP system shall be taken outside the room and terminated in the drain/manhole chamber.

CIP station shall have CIP tanks, plate heat exchangers, filters, pumps, valves and fittings etc. The system shall be operated and controlled from control station. The details of the on-going CIP program shall be displayed in the control station. The system shall be totally secured against the mixing of cleaning solutions with the products in case of malfunction in the system or power failure. The system shall be fully automatic and pre-programmed. However, it shall be possible to select/modify the cleaning sequence and duration from the control station.

High and low level probes shall automatically control levels of chemicals in the service tanks. Necessary pipes & fittings with pneumatic valves shall be provided.

Cleaning Program:

The CIP system shall generally have the cleaning program/sequence detailed below:

- Water Pre-rinse (to be drained)
- Hot Detergent circulation
- Hot/cold water rinse
- Hot Acid circulation
- Hot/cold water rinse
- Hot water Sterilisation

The system shall facilitate bypass of any operation from the above sequence of programs. At the end of detergent and acid cleaning, the solution shall be recovered with the help of sensors provided in the return line and substandard solutions shall be automatically diverted to the drain. The concentration of detergent and acid shall be maintained with the help of an automatic dosing system equipped with conductivity probes.

Chemical dosing shall not be done during the CIP cleaning process. Between each successive cleaning cycle the conductivity meters installed on the tanks shall measure the strength of the cleaning solution. If the strength shall be found less, dosing shall be done automatically suitable numbers of conductivity meters, pneumatic valves and other necessary fittings / instruments shall be provided for guiding CIP solutions to the respective tanks or drain. Intermediate rinse shall be with plain hot/cold water. The alkaline/acidic traces shall be removed with the help of cold/hot water. Hot water rinse shall ensure satisfactory cleaning of the lines and equipment. Final rinse water shall be drained. The completion of CIP of every circuit shall be suitably signaled. Sequence of operations and detergent acid consumption shall be automatically recorded in the PLC and shall be recalled on the screen on demand. The temperature and concentration of cleaning solutions shall be continuously monitored and corrected automatically. In case of non-compliance of any of the parameters, the sequence shall remain suspended for such time and resume to "NORMAL" when corrected. The route for CIP circulation shall be pre-programmed. The solution spray shall be only through spray balls. CIP solution shall be returned to the CIP unit through self-priming CIP return pumps at each circuit. If the program execution stops at particular step due to power failure or fault, then commencement of program execution shall be from the same step where the program was terminated after restoration of power/rectification of fault with the help of reset switch.

Arrangements shall be made to ensure that adequate quantity of the cleaning solutions at the desired temperature and pressure reach the equipment to be cleaned. Each CIP unit return lines from each CIP circuit shall be equipped with a conductivity probe and a temperature transmitter. The conductivity probes shall detect the interface between detergent/acid solution and rinse water, and shall be used to control various routing valves in each circuit return line. These probes shall also detect substandard solutions and divert them to drains. The temperature transmitter shall monitor temperature of water returning during hot water sterilization cycle.

Within each CIP unit, appropriate valve manifolds shall be provided for the CIP circuit to operate independently and for routing of various cleaning fluids to the required section of the process plant. Additional manifolds shall be provided to allow cleaning fluids to be recovered re-circulated or drained. The equipment/pipelines/tanks being cleaned under each circuit and the number of circuits being used in each system shall be indicated.

Pneumatically operated drain valves shall be provided in all low points of the system pipe work to ensure the lines are fully drained. The cleaning programs shall have safety interlocks to ensure isolation of the relevant circuit in a section before a cleaning cycle starts. Operation of each CIP unit shall be fully automatic and shall be controlled from the DCS. The operator shall select individual cycles/circuit and cleaning initiated from the main control room.

6. INSTRUMENTATION & AUTOMATION

The entire Control & Automation (C&A) system shall be designed, supplied and commissioned to enable the operator to operate the KHOA plant in a safe, efficient and reliable manner, without exceeding plant operational limits and ensuring the overall performance guarantee conditions. The C&A System shall be designed utilizing state-of-the-art technology to ensure:

- High degree of system availability and reliability.
- Extensive diagnostic capability to pinpoint failure areas.
- Low downtime and high meantime between failures.
- System flexibility and modular expansion capability.
- Safety of the main equipment, system and operating personnel.
- Consistent product quality using advance predictive control system (APC).
- Open connectivity using OPC (client server architecture)
- Hot swappable system modules.

The C& I System shall be configured to perform the following basic functions: -

- Start-up and shutdown of major equipment of the plant maintaining the operating conditions.
- Regulation functions for various valves to achieve guaranteed performance.
- Acquisition, display and archiving of plant data and generation of reports.

The entire operation and monitoring under all regimes of operation i.e. start-up, normal operation, shutdown etc. shall be possible through operator's consoles in control room. HMI (human machine interface) panel shall be used for control &

monitoring of milk reception activity and shall be connected to the main control network for interfacing with the main high end PLC system.

Communication of all field instruments with high end PLC shall be through Field Bus only. Instruments shall be smart type. All process operations are considered as automatic.

The system should be provided with regulating and control system loops consisting of Transmitter, Electronic controller and control valve. Instrumentation and control scheme of the evaporator plant should essentially comprise of following

- Steam pressure monitoring & control.
- Temperature monitoring at various location.
- Vacuum indication & control.
- Feed flow monitoring & control
- Final concentrate density monitoring & control.
- Condensate conductivity monitoring.

7. ELECTRICAL DISTRIBUTION SYSTEM

The purchaser shall provide the required power supply at one point in the KHOA section IMCC. From there on it shall be responsibility of the Bidder to design a suitable electrical System as per the latest IS specification, Indian electricity rule, including special requirements of concerned state electricity Inspectorate. The system shall be designed to receive, control & distribute electrical power at 415V, 50Hz AC in sheet steel housing powder coated finished in Siemens grey. The acceptable variation in voltage is +/- 5% & frequency is +/-3%.

The scope would consist of design, supply, Installation, testing and commissioning of Intelligent Motor Control Centres and ancillary panels with complete switchgears & electricals.

Required quantity of armoured cable /control cable / Instrument cable / GI perforated cable trays, GI drop conduit pipes, plate type earth pit, earthing network, earthing conductors, load break Isolators / PB station near motors for emergency isolation, rubber mats for panels etc. shall be provided. Power cables shall be suitable for use on 415 V system, shall be of 1100 V grade, Aluminum conductor, PVC insulated, armoured and overall PVC sheathed strictly as per IS 1554(Part -I, 1976 - Amended upto date) .

The detailed specification of the required electrical system shall be provided by Bidder.

8. SERVICES & UTILITIES

A well-designed khoa plant proposed by the bidder shall conform to the product process parameters stated earlier and has the lowest consumption of utilities & services.

All the utility piping, fittings for steam, chilled water, cooling tower water, RO water, Raw water, compressed air with in the battery limits shall be supplied with supports and clamps.

SCHEDULE – III: BATTERY LIMIT

BATTERY LIMIT

Item	Purchaser's Scope	Supplier's Scope Includes
Civil works	Necessary foundations for equipment based on the details provided by the equipment supplier.	Supply of necessary foundation bolts along with the template, sub base, motor slide rails and all other associated erection materials. Civil work pertaining to the earthing, grouting of various foundation bolts, other patch up/finishing works, specifically for the cut-openings in the wall, ceiling etc. including supply of necessary civil materials/ pipe sleeves required for the above. Rectification of defective work resulting from the incorrect / delayed / in sufficient information provided by the supplier.
MILK	Standardized milk line shall be supplied, laid by LMP supplier, starting from outlet of pump in valve cluster of PMST at LMP plant and shall be given with a tapping at inlet of MFT tank. CIP and product recovery of this transfer line shall be in scope of LMP plant supplier including laying of CIP return line back to process LMP CIP Kitchen. This transfer shall be done on signal exchanges between LMP plant and khoa plant supplier	Scope of work start from milk formulation tank. Valve cluster at MFT (milk formulation tank) is in scope of KHOA plant. Necessary valves, isolation, Instrumentation and CIP valves required at KHOA plant shall be in scope of KHOA plant.
CIP lines	Concentrated CIP chemicals at the outlet of LMP ACID& Caustic tank.	Conc. CIP chemical lines from the conc. bulk Acid & Caustic tank to solution tanks. Complete 1set of CIP kitchens with required circuit.

Item	Purchaser's Scope	Supplier's Scope Includes
RAW/SOFT/RO Water lines	Tapping shall be provided at one point adjacent to KHOA plant.	Distribution of Raw/ soft/ RO water lines to all consumption point.
Compressed air lines	Tapping shall be provided at one point adjacent to KHOA plant.	Distribution of compressed air lines to all consumption point.
Chilled water Supply & Return	Tapping shall be provided at one point adjacent to KHOA plant	Distributions of Chilled water lines to all consumption points & return line outside the plant.
Steam & Condensate	HP tapping @ 8kg/cm ² g shall be provided at one point adjacent to KHOA plant.	Steam PRS and distribution of HP & LP steam lines to all consumption points & condensate return line outside the KHOA plant.
Power	Power shall be made available at the IMCC, located at KHOA plant. Required runs of cable from PCC to IMCC, Cable trays from PCC to IMCC and termination at both ends shall be the scope of purchaser (Substation Supplier).	Distribution of power and controls from the respective IMCC up to the consumption points. Necessary Earthing of IMCC. In included in the scope of this tender.
Automation / MIS	Networking up to KHOA control room	KHOA plant complete automation including all third parties interfacing inside the plant & utility related equipment/Instruments.