शुद्धता का संकल्प

उज्जैन सहकारी दुग्ध संघ मर्यादित,

मक्सी रोड़, उज्जैन (म.प्र.) 456 010

E-Tender for DESIGN, ENGINEERING SUPPLY AND LABOUR JOB FOR CONSTRUCTION, INSTALLATION, TESTING, COMMISSIONING, SUCCESSFUL TRIAL RUN AND TRAINING OF 4 TPH CAPACITY GAS/ OIL (DUAL) FIRED BOILER TO BE INSTALLED AT MAIN DAIRY PLANT OF UJJAIN SAHAKARI DUGDHA SANGH MARYADIT, UJJAIN.

ई–निविदा क्रमांक उ.दु.स./नस्ती क्रं. 21/याँत्रिकी/2022/459 दिनांकः 07.02.2022

उज्जैन सहकारी दुग्ध संघ मर्यादित,
मक्सी रोड़, उज्जैन (म.प्र.) 450010
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ई–निविदा प्रपत्र मूल्यः– रू. 1,000.00(रू. एक हजार मात्र)

उज्जैन सहकारी दुग्ध संघ मर्यादित

UJJAIN SAHAKARI DUGDH SANGH MARYADIT

Maksi Road P.B. No 106,UJJAIN - 456010, Madhya Pradesh
Phone : (0734) 2527071

E-mail: udsplant@yahoo.com, engg_uds@sanchidairy.com **G.S.T. 23AAAAU0051C1ZB**

क्रमांकःउ.स.दु.सं./याँत्रिकी/नस्ती क्रं.21/2022/459 उज्जैन, दिनांकः 07.02.2022

E-Tender Notice

Ujjain Sahakari Dugdh Sangh Maryadit Ujjain invites on-line tenders from manufactures/suppliers having adequate experience in design, construction, fabrication, supply, erection, testing and commissioning, trial run and training of 04 TPH (Gas + Oil fired) Dual Boiler. Tender document is available & can be download from the website http://www.mptenders.gov.in from 11-02-2022 from 3:00PM. The tender document is also available on the website www.sanchidairy.com/ www.sanchiujjain.com of MP Co-operative Dairy Federation to read the terms & conditions., scope of works etc. as a reference only. The CEO, USDS reserve the right to accept or reject any or all the tenders without assigning any reason.

Sl. No.	Particulars	Qty.	EMD	Cost of tender doc	Last date for purchase of tender Form
01	Supply, Installation & Commissioning of Capacity 04 TPH (Gas + Oil fired) Boiler on turnkey basis.	01 No.	₹ 5,00,000/-	₹ 1,000/-	03-03-2022 up to 2:30 PM

Chief Executive Officer
Ujjain Sahakari Dugdh Sangh Mayadit Ujjain

उज्जैन सहकारी दुग्ध संघ मर्यादित

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क्रमांकःउ.स.दु.सं./याँत्रिकी/नस्ती क्रं.21/2022/459 उज्जैन, दिनांकः 07.02.2022

1. NAME OF WORK:	DESIGN, ENGINEERING SUPPLY AND LABOUR JOB FOR CONSTRUCTION, INSTALLATION, TESTING, COMMISSIONING, SUCCESSFUL TRIAL RUN AND TRAINING OF 4 TPH CAPACITY GAS/ OIL (DUAL) FIRED BOILER TO BE INSTALLED AT MAIN DAIRY PLANT OF UJJAIN SAHAKARI DUGDHA SANGH MARYADIT, UJJAIN.
2. PERIOD	The bidder shall complete supply, installation, testing, commissioning and successful trial run within six months from the date of agreement.
3. Last date & time for Tender Document purchase online	03-03-2022 up to 2:30 pm
4. Last date and time for on-line submission of Bid .	03-03-2022 UPTO 2:30 P.M
5. Date and time of on-line opening of Technical Bid documents.	04-03-2022 AT 3:00 P.M.
6. Date and time of opening of on line price bid.	Shall be communicated separately
7.Cost of Tender Document	₹ 1,000/-
8. Earnest Money Deposit (E.M.D.)	₹ 5,00,000/- (Rs. Five lakh Only)
9.Address for Communication.	UJJAIN SAHAKARI DUGDH SANGH MARYADIT DAIRY PLANT . MAXI ROAD UJJAIN (MP)

Chief Executive Officer
Ujjain Sahakari Dugdh Sangh Mayadit Ujjain

TENDER DOCUMENT

TENDER DOCUMENTS FOR DESIGN, ENGINEERING, SUPPLY, CONSTRUCTION, INSTALLATION, TESTING, COMMISSIONING, SUCCESSFUL TRIAL RUN AND TRAINING OF 4 TPH CAPACITY GAS/ OIL FIRED BOILER TO BE INSTALLED AT MAIN DAIRY PLANT OF UJJAIN SAHAKARI DUGDHA SANGH MARYADIT, UJJAIN.

OWNER: UJJAIN SAHAKARI DUGDH SANGH MARYADIT, UJJAIN.MP

TECHINICAL CONSULTANT:

MARIGO CONSULTANTS

Engineers, Architect & Project Management Consultants
Flat No- G-II NilgiriAppartment Anoop Nagar `` opposite CHL Hospital A.B. Road Indore (M.P)

Email ID – marigo_consultants@rediffmail.com
Contact No.- 9827065342, 9826149023

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Section I Part -I General Conditions of Contract

INSTRUCTIONS TO BIDDERS:

TENDER NOTICE

Tenders are invited for **DESIGN, ENGINEERING, SUPPLY, CONSTRUCTION, INSTALLATION, TESTING, COMMISSIONING, SUCCESSFUL TRIAL RUN AND TRAINING OF 4 TPH CAPACITY GAS/ OIL FIRED BOILER TO BE INSTALLED AT MAIN DAIRY PLANT OF UJJAIN SAHAKARI DUGDHA SANGH MARYADIT, UJJAIN**

1.METHOD OF SUBMISSION OF TENDER

The Tenderers are requested to through the tender document's instructions and various terms and conditions contained their in. It may be noted that no conditions or stipulations to the contrary or which are inconsistent will be accepted. Tenderers are requested to ensure that all such schedules along with questionnaire (duly filled-in), are submitted along with their offer. The Tenderers should also note that in absence of any of the schedules, their offer is likely to be rejected.

All the details to be filled as per tender document format and Tenderers should read all instructions for compliance before submitting his tender.

The tender to be submitted in two parts as explained below:

Part –A: This part is fulfilling the requirement of deposit towards Earnest Money and Technical Bid along with duly filled questionnaire (Both EMD and Technical bid documents should be uploaded in separately subscribing as:
"EMD for **DESIGN, ENGINEERING, SUPPLY, CONSTRUCTION, INSTALLATION, TESTING, COMMISSIONING, SUCCESSFUL TRIAL RUN AND TRAINING OF 4 TPH CAPACITY GAS/ OIL FIRED BOILER TO BE INSTALLED AT MAIN DAIRY PLANT OF UJJAIN SAHAKARI DUGDHA SANGH MARYADIT, UJJAIN**.
The supplier in this part should upload the online acknowledgement of purchase of tender document and payment of EMD amount On or before tender opening date as per schedule of submission mentioned in General Information.

Scaned copies of above documents are to be uploaded online on the website- https://mpetenders.gov.in

Part -B : - For this part shall contain duly filled Price Bid as per the price bid form and to be uploaded on line on website- https://mpetenders.gov.in

Tenderer to provide an undertaking signed by self or his authorized representative as a token of acceptance of the terms and conditions of tender as below on firm's letter head:

"TENDER Reference No.
"IT IS CERTIFIED THAT I/WE CATEGORICALLY AGREE TO ALL THE TERM CONDITIONS OF THIS TENDER ":-
Signature of authorized Signatory of the Unit (with seal).

Pl. note that all the above documents are to be uploaded online only and not to be submitted physically or else bid will be rejected without opening technical bid.

2. BASIC QUALIFICATION OF TENDERER:

This tender is open for all adequate experienced suppliers/ manufacturers/ authorized channel partners cum erector of boiler as per the norms laid down in IBR and who provide satisfactory evidence of :

Bidder must quote who have at least completed minimum 03 nos.(three) of similar nature of work for design, executed supply, construction of Boiler house, installation, testing and commissioning of 4 TPH and above capacity gas cum oil fired IBR approved boilers. The cost of the work order so completed should not be less than the cost of this tender quote offered by bidder for any of the industry/ institution within last three years (ie. 2019 - 20, 20-21 and 21-22).
Documentary evidence shall be provided for successful completion of the work in support of above.

3. EARNEST MONEY

The supplier shall deposit the Earnest Money amount (EMD) on line as mentioned in respective clause . In case, the supplier withdraws his offer during the validity period, after placement of order, the EMD amount shall be forfeited.
EMD shall be returned to the un-successful Tenderer, as soon as possible, after the tender is decided and on execution of agreement with successful Tenderers. No interest shall be paid on EMD amounts.

4. TAXES AND DUTIES

All taxes (CGST/SGST/) and duties/ any other taxes should be included in the prices quoted. Any kind of taxes and duties shall not be paid extra. However, the breakup of taxes & duties must be indicated separately.

5. AMENDMENT IN SPECIFICATIONS

The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN -.may revise or amend the specification and drawing, prior to the date notified for opening of Bid of tender. Such revision/ amendment, if any, will be uploaded on the same web site as corrigendum, hence bidder to check the same before uploading the bid. No separate communication shall be made in this respect.

6. DELAYED/ LATE SUBMISSION OF TENDERS

The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN -. shall not assume any responsibility for any delays for the late submission of documents by supplier for any of the reasons.

7. ALTERNATIVE TENDERS

Tender should be submitted as per intent of tender documents; any alternative offers are liable for rejection.

8. MISTAKES IN TENDERS
Rates should be quoted in both, figures, and words. In case of ambiguity between rates in figures and words, lower of the two/beneficial to the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN shall be considered. Such offers can also be rejected on recommendation of committee.

9. Documents to be submitted with the tender:
Apart from documents required as mentioned in part-1 for the online payment of purchase of tender document, payment of EMD and technical bid the followings are to be submitted in support of eligibility of the bidder:

1. Copy of Registration Certificate of the Firm / Organization (Tenderer)
2. Copies of purchase orders last three years along with successful completion certificates.
3. Copies of Income Tax and GST returns & copy of Permanent Account Number (PAN)
4. Proof of registration from Employees provident fund organization (EPFO) and ESI and coverage under group insurance.

10. ALTERATIONS/CORRECTIONS IN TENDERS

Any alteration/correction in the tender document should be counter-signed. Further, no post tender alteration/correction shall be entertained.

11. INCOMPLETE TENDERS

Tender which is incomplete or obscure in any form is liable for rejection.

12. ACCEPTANCE OF PART/WHOLE TENDERS & NEGOTIATION OVER TENDERERS RIGHTS THERE OF

Chief Executive Officer, Ujjain Sahakari. Dugdha Sangh Mydt, may Negotiate with Lowest renderer On

The Tender Date Or Any Suitable Date decided thereof.

UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN -. reserves the right to accept/ reject wholly or partly any tender without assigning any reason whatsoever and shall not entertain any correspondence in this regard.

13. AMBIGUITIES IN CONDITIONS OF TENDERS

In case of ambiguous or self-contradictory terms/conditions mentioned in the tender, interpretation as may be advantageous to the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN shall be taken without any reference to the tender.

14.DIS-QUALIFICATION OF TENDERS

Tender which gets opened before the due date because of improper uploading the documents, will be disqualified and Tenderer will not be permitted to change the substance of his tender on post interpretation/improper understanding grounds. This includes post tender price changes/ modifications etc. after opening of Price Bid. In such events, otherwise, that is, when a supplier does not comply, tender will be rejected.

15. DEVIATIONS FROM TERMS & CONDITIONS

Offers with deviations in the terms of payment, liquidated damages, EMD and performance guarantee are liable to be rejected out rightly.

16. OPENING OF E.M.D. & TECHNICAL BID

Mandatory documents to be submitted as mentioned in above clauses shall be part of Technical Bid.

The concerned tender committee of USDS shall first open the Part —A of all the Tenderers and verify the Earnest Money Deposit and Technical Bid submitted by the Tenderer. Committee shall check for the validity of Earnest Money Deposit as required. In case, the requirements are incomplete in EMD and Technical Bid another part-II of Price Bid of the concerned Tenderer shall not be opened. The requirement for EMD and Technical Bid shall

be verified and thereafter, the second part, i.e., Price Bid submitted by the Tenderer shall be opened on the same date or as may be fixed by USDS in respect of eligible Tenderer.

17. VALIDITY OF TENDERS

The offers shall be valid for 90 days. Validity of the offer shall be counted from the date of opening of tenders. Those who do not agree for a validity of 90 days will do so at their own risk and their offers are liable to be rejected.

18. AUTHORISATION/LOCAL REPRESENTATIVE

Only authorized representative, possessing necessary authority letter from the supplier who have participated in the tender shall be allowed to attend the tender opening.

19. ACCEPTANCE OF TENDER

I. The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-. may reject any or all tenders or to accept any tender considering advantageous to UJJAIN SAHAKARI DUGDHSANGHA MARYADIT, UJJAIN-. Whether it is the lowest offer or not.

II. The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-. may split the quantities against the tender on more than one supplier for the same item and shall not be liable to assign any reasons for this and the same will be binding on the Tenderer.

iii). USDS will award the contract to the successful bidder whose bid has been determined to be the lowest- evaluated responsive bid as per the eligibility Criterion mentioned. The Cost for the said calculation shall be taken as the all-inclusive cost quoted by bidder in price bid.

20. PAYMENT TERMS AND PERFORMANCE BANK GAURANTEE: -

Payment shall be made by A/c payee Cheque or RTGS only. The Schedule of Payment shall be as follows:

1. USDS shall pay to the contractor 70% of the approved bid price of respective items (equipment/accessories only) from time to time as and when supply of Boiler equipment/ accessories and installation in accordance with contract & to the satisfaction of USDS Engineer/ consultant after verification.

2. Out of remaining 30% of the respective executed work, USDDS shall pay 20% after successful testing and commissioning.

3. Remaining 10% amount shall be paid by USDS after 03 months from the date of successful trial on submission of satisfactory report by USDS engineer/ consultant and also on submission of performance bank guarantee of the equal amount of 10% of bid value.

4. At end of the completion of the project. Performance bank guarantee shall be for one year from the date of successful commissioning and trial shall be released on the satisfactory report of USDS engineer/ consultant when no defect liability or else if such liability is due/ recoverable, it shall be adjusted from contractor's performance bank guarantee amount by initiating action from concerned bank.

5. **ADVANCE PAYMANT:**

a) 20% advance on supply value shall be payable against bank guarantee of 110% of advance amount valid till scheduled date of delivery/ actual delivery of material (as per attached format-for bank guarantee).

21. PRICES AND STATUTORY LEVIES

The Tenderers should quote price of the design and supply of plant and equipment/ accessories of Boiler along with in separate column for civil construction materials for construction of RCC foundations/ any other to support MS structure and Mild Steel for reinforcement of foundations, fabrication of platforms, MS structure, staircase, Chimney, shed for Boiler house like on F.O.R. destination/ erection site including freight, insurance.
Price for labour job for construction, fabrication Erection, Installation, Commissioning, trial run and training charges shall be quoted separately along with applicable rate of gst on turnkey basis.

However, break up of Following elements may be indicated separately as per the format of price bid: -

Unit Ex-works/Ex-go down rate including packing and forwarding.
GST/ any other Duty applicable on Ex-works price as on date of Tender. Tax :GST
Freight charges Any other levy/tax NA
No revision on any account shall be allowed during execution of the order.
Prices offered by the renderer should be firm and free from all escalations. The prices offered should be valid at least for a period of 90 days from the date of tender opening. Rate approval shall be communicated within 30 days from the date of tender opening.

The Material to be supplied shall be dispatched to site by Road transport under intimation to the purchaser and consignee. Depending upon the type of material, the supplier shall have to carry out proper packing/crating to avoid damage/breakage during transit. Road permit/any other document for dispatch of material if required will be sent by USDS on written request from supplier.

After rate approval, the party shall have to execute an agreement on a non—judicial stamp paper worth Rs. 1000/- to be executed with Ujjain Sahakari Dugdh Sangha Maryadit, Ujjain.

22. TRANSIT RISK
Responsibility regarding covering of risks during transit of material shall entirely be on the supplier. The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-. shall, in any case, not bear the transit risks/ transit insurance charges. Insurance shall be arranged by the supplier at his own.

23. SUBMISSION OF DRAWING AND LITERATURE
All the relevant drawings, layouts shall be submitted along with supply of machines. One set of drawing, Descriptive Literature and instructions Manual for Erection, Commissioning, and maintenance of the equipments ordered, shall be supplied.

24. DELIVERY: Supply, Erection, Installation & Commissioning shall be commenced within the period as mentioned in respective clause (including rainy season) from the date of contract agreement. In case of any delay due to assembling or any other technical reasons, supplier will have to communicate in advance in written to the CEO, Ujjain Sahakari Dugdh Sangha Maryadit , Ujjain.

25.FORCE MAJEURE:

Force majeure condition is herein defined as:-

Natural phenomena, such as floods, draughts, earth-quakes and epidemics.
Act of any Government Authority, domestic or foreign, such as war, quarantines, embargoes, licensing control or production or distribution restrictions.
Accident and disruptions such as fires, explosions, increase in power cut with respect to date of tender opening, break-down of essential machinery or equipments etc.
Strikes slow down, lockouts continuing for more than three (3) weeks.
Failure or delay in the supplier's source of supply due to force majeure causes enumerated at (a) to (d) above, provided the supplier produces documentary
evidence to show that there were no other alternative sources of supply available to him or if available, the lead time required was likely to be longer than the duration of the Force Majeure at the normal source of supply.
Any cause which is beyond the reasonable control of the supplier or purchaser as the case may be. All the provisions of this clause shall apply whether the disrupting cause is total or partial in its effect upon the ability of the supplier to perform.

26. FORWARDING BILLS INVOICE

The original bills should be forwarded to the paying authority and should be marked "ORIGINAL". The bill should indicate GST registration Number and date allotted to him under commercial Tax Act. The invoice in triplicate with relevant documents such as Material Receipt in good condition etc. should be submitted to UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN.

27. PERFORMANCE GAURANTEE.

if during 12 months from the date of commissioning any of the goods found to be defective in materials or workmanship or develops defects during service, they will have to be replaced by the supplier, free of all charges. All necessary arrangements on these accounts will be made by the supplier.

The said material if required to be replaced, shall be collected by the supplier/ firm from Area Stores/ work site at their own cost and at their own responsibility. These materials will likewise be returned duly repaired/ replaced and tested subsequently by the supplier to the destination indicated on "FREIGHT PAID BASIS" at their cost in a reasonable time of 30 days from the date of intimation. The guarantee period as stipulated in clause above shall also be applicable for repaired/replaced material, which shall however be counted afresh from the date of its delivery in our stores/site.
Further, it is clarified that all the charges towards supply of fabrication materials including packing, forwarding, loading, unloading shall be borne by the supplier. The amount deposited under security deposit clause shall also cover the performance guarantee of the material. All equipment/ line materials reported failed within the specified guarantee period may be replaced free of cost by the supplier.

Actual cost of dismantling and replacement of these' equipments/ materials with the new ones may be charged to the supplier's account. To and fro transportation cost of such failed equipment may also be borne by the supplier/ supplier.

In the event of the supplier's inability to adhere to the aforesaid provisions, suitable penal action will be taken, which may include blacklisting of the firm for future business with the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-. for a period as decided by USDS.

28. COMPLETENESS OF EQUIPMENTS:

The equipment/material shall be completed in every respect with all minor fittings and accessories, even though these may not be specifically mentioned in the purchaser's specifications or the tender's offer. The supplier shall not be eligible for any extra price in respect of such minor fitting and accessories which can be considered as an essential part of the basic equipment even though not specifically mentioned in the specification or in the offer.

29. EXTENSION ORDER

The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN -.Reserves right to place an extension order for any additional quantity to the extent of 100% quantity of the original order on the same rates, terms and conditions within six months from the date of order.

30. RECOVERIES FOR LIABILITIES AGAINST OTHER CONTRACTS

All amount recoverable from the successful Tenderer against earlier contracts including orders on sister concern with the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-.will be adjusted from payment due against the contract that may be awarded under this specification.

31. COMPLIANCE OF REGULATIONS:

The supplier should execute and deliver such documents, as may be needed, by the purchaser in evidence of compliance. All laws, Rules and Regulations are required to be incorporated in this reference. Any liability arising out of contravention of any of the laws shall be the sole responsibility of the supplier and the purchaser shall not be responsible in any manner whatsoever.

32. CANCELLATION OF ORDER

The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-. May upon written notice of default, terminate contract in the circumstances detailed here under: -
If in the opinion of the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN, the supplier fails to deliver the material within the time specified or during the period for which extension has been granted by the USDS.

If in the opinion of the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN , the supplier fails to comply with any of the other provisions of this contract or material is found not in accordance with prescribed specifications and or the approved samples

As a result of stage inspection, if applicable, it is revealed that material and/ or, workmanship is substandard which is likely to affect the performance of the finished product, a notice would be served' by the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-. to the supplier to suspend further activities and to take urgent steps towards corrective measures,

failing which the entire order would be cancelled.
In the event of such termination, UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN shall exercise its discretionary power as :-
a) To recover from the supplier the agreed liquidated damages.
OR
b) To purchase from elsewhere after giving due notice to the supplier on account and at the risk of the supplier such stores/ material not so delivered or others of similar description in respect of consignment not yet delivered.
OR

c) To cancel the contract reserving UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-.'s right to recover damages.

Notwithstanding that the powers under clause (a, b & c) referred to above, are in addition to the rights and remedy available to the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN under the general law of India relating to Contract.

In the event of risk purchase of stores of similar description, the opinion of the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN shall be final. In the event of action taken under clause (a) or (b) above, the supplier shall be liable to pay for any loss, which the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT UJJAIN . may sustain on that account but the supplier shall not be entitled to any saving on such purchases made against the default.

The decision of the Chairman, UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN shall be final regarding the acceptability of the stores supplied by supplier and the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN-. shall not be required to give any reason in writing or otherwise at any time for the rejection of the stores/ material. In the event, UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN -. does not terminate the order as provided in clauses above, the supplier shall continue execution of order, in which case he shall be liable to the UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN.

33. ARBITRATION

In case of any dispute ,if arises between the parties relating to any terms and conditions of the Tender / Agreement and or regarding the agreement /tender before or after the filling of tender and /or execution of the agreement, any party may refer the dispute to a sole arbitrator who will be the Chairman of Ujjaun Sahakari Dugdh Sangha Maryadit ,Ujjain or a person nominated by him whose decision and award shall be final and binding to both the parties. The arbitration proceedings shall be under and accordance with provision of Arbitration and Conciliation Act 1996. Supplies under the Contract shall be continued by the supplier during the arbitration proceedings, unless otherwise, directed in writing by the Purchaser or unless the matter is such that the work cannot possibly be continued until the decision of the arbitrators or of the Umpire is issued.

34. JURISDICTION
Any dispute or difference, arising under, out of, or in connection with this tender/ contract order shall be subject to exclusive jurisdiction of competent court at Ujjain only.

35. RANDOM TESTING-

Inspection of material after receipt or waiver of inspection will not relieve the supplier from his responsibility to supply the material strictly in accordance with the specification. The UJJAIN SAHAKARI DUGDH SANGHA MARYADIT, UJJAIN In case, the samples fail to withstand the required test, the entire lot will be liable to be rejected (i.e. unused material so

supplied) and the supplier will have to refund the amount paid, including all taxes and duties, as well as the test charges thereof, after inspection. Such quantities or rejected material as identified, shall be removed by the supplier and replaced in full at his own cost

36. CORRESPONDANCE: -
Copies of all important correspondence on subject should be sent to "CEO, Ujjain Sahakari Dugdh Sangh Maryadit, Ujjain".

37. CONSEQUENCES OF BREACH OF AGREEMENT
If the authorized person of the unit or a partner in the contract/tendering firm commit breach of any of the conditions of agreement it shall be lawful for the Chief Executive Officer, Ujjain Sahakari. Dugdha Sangh Mydt, to cancel the contract and purchase or authorize to purchase stores at the risk and costs of the unit.

38. DISPUTE ARBITRATION & FINAL AUTHORITY

It should be clearly understood that in the event of any dispute between suppliers and purchaser due to

deviation from any terms and conditions of work order & contract agreement, the decision of the Chairman, Ujjain Sahakari Dugdha Sangh Mydt., in this respect will be final and binding on both supplier and purchaser.
For matters of dispute, relating to the interpretation of the above clause, the decision of the Chief Executive Officer, Ujjain Sah. Dugdha Sangh Mydt, shall be final and binding on all the concerned.

39. Liquidated damages

If the supplier fails to deliver any or all of the Goods or perform the Services within the time period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to:

i. Up to 15 days 1% of the contracted value
Ii.Between 16 to 30 days 2% of the contracted value
Iii Beyond 30 days 5 % of the contracted vale USDS reserves the rights to either to cancel the order and make alternative purchase from other sources at the risk and cost of the of defaulting supplier.

(Section I - Part-II)-

Special Conditions of Contract for General Erection & Commissioning

1. Sufficiency of Tender

The Bidder/Supplier by bidding shall be deemed to have satisfied himself as to all the conditions and circumstances affecting the Contract Price, as to the possibility of executing the works as shown and described in the Contract, as to the general circumstances at the site of the works, as to the general labour position at site and to have determined the prices accordingly.

2. Program of Installation & Commissioning

As soon as practicable after the acceptance of the bid, the Bidder/Supplier shall submit to the Purchaser for his approval a comprehensive programmed in the form of bar chart showing the sequence of order in which the Bidder/Supplier proposes to carry out the works including the design, manufacture, delivery to site, erection and commissioning thereof. After submission to and approval by the Purchaser of such programmed, the Bidder/Supplier shall adhere to the sequence of order and method stated therein. The submission to and approval by the Purchaser of such programmed shall not relieve the Bidder/Supplier of any of his duties or responsibilities under the Contract. The programmed approved by the Purchaser shall form the basis of evaluating the pace of all works to be performed by the Bidder/Supplier. The Bidder/ Supplier shall update the PERT Network every month, submit it to the Purchaser and shall inform the Purchaser the progress on all the activities falling on schedule for the next reporting date.

3. Preparation of Drawings for Approval

The Bidder/Supplier should visit the site to acquaint himself in respect of existing site conditions and to know the details/information required for understanding the nature and type of works involved in the project. The Bidder/Supplier shall submit to the Purchaser for approval:

. Within the time given in the specification or in the program, such drawings, samples, patterns and models as may be called for therein, and in numbers therein required.

. During the progress of works and within such reasonable times as the Purchaser may require such drawings of the general arrangement and details of the works as the Purchaser may require.

. During the progress of works and before the start of the erection activities, Supplier to submit the intelligent 3D for entire plant in the freeware software format for the approval to the Purchaser/Consultant

Wherever necessary, the Bidder/Supplier would be provided with a set of
drawings where the erection works would be carried out and also the equipment details/ drawings of various equipment's handed over to the Bidder/Supplier by the Purchaser.

The specifications/ conditions concerning the submission of drawings by the Bidder/Supplier are detailed as under:

Bidder/Supplier shall furnish a list of all necessary drawings, which the
Bidder/Supplier shall submit for approval, identifying each drawing by a serial number and descriptive title and expected date of submission. A brief list of drawings is given in Table 1. This list shall be revised and extended if necessary, during the progress of work depending on the nature of the contract also.

The Purchaser shall signify his approval or disapproval of all drawings or such drawings that would affect progress of the contract as per the agreed programmed.

The purchaser shall issue, within four weeks of time in all circumstances, any drawing requested by the Bidder/Supplier and required to be provided by us. If the Bidder/Supplier

suffers delay and/ or incurs costs due to delay on purchaser's part in this regard, then the Purchaser shall take such delay into account in determining any extension of time to which the Bidder/Supplier is entitled under Clause 15 hereof and the Bidder/Supplier shall be paid the amount of such cost as shall be reasonable.
P&I Drawings, Plant Layout and GA Drawings submitted for approval shall be signed by responsible representative of Bidder/Supplier and shall be to any one of the following sizes in accordance with Indian Standards: " A0, A1, A2, A3 and A4"
All drawings shall show the following particulars in the lower right hand corner in addition to Bidder/Supplier's name:
Name of the Purchaser Date of drawing
Project Title Drawing number Title of drawing
Space for drawing number Scale Drawing Revision Number

In addition to the information provided on drawings, each drawing shall carry a revision number, date of revision and brief description of revision carried out. Whenever any revision is carried out, correspondingly revision number must be updated.

All dimensions on drawings shall be in metric units.

Drawings (three sets) submitted by the Bidder/Supplier for approval will be checked, reviewed by the Purchaser, and comments, if any, on the same will be conveyed to the Bidder/Supplier. It is the responsibility of the Bidder/Supplier to incorporate correctly all the comments conveyed by the Purchaser on the Bidder/Supplier's drawings. The drawings, which are approved with comments, are to be re-submitted to the Purchaser for purpose of records. Such drawings will not be checked / reviewed by the Purchaser to verify whether the Bidder/Supplier has incorporated all the comments. If the Bidder/Supplier is unable to in corporate any comments in the revised drawings, Bidder/Supplier shall clearly state in his forwarding letter such non-compliance along with thevalid reasons.

Drawings prepared by the Bidder/Supplier and approved by the Purchaser shall be considered as a part of the specifications. However, the examination of the drawings by the Purchaser shall not relieve the Bidder/Supplier of his responsibility for engineering design, workmanship, and quality of materials, warranty obligations and satisfactory performance on installation covered under the contract.
If at any time before completion of the work, changes are made necessitating revision of approved drawings, the Bidder/Supplier shall make such revisions and proceed in the same routine as for the original approval.
Date of submission: In the event, the drawings submitted for approval require many revisions amounting to redrawing of the same, and then the date of submission of the revised drawings would be considered as the date of submission for approval.

The Bidder/Supplier shall furnish to the Purchaser before the works are taken over, Operating and Maintenance instructions together with Drawings of the works as completed, in sufficient detail to enable the Purchaser to maintain, dismantle, reassemble and adjust all parts of the works. Unless otherwise agreed, the works shall not be considered completed for the purposes of taking over until such instructions and drawings have been supplied to the Purchaser.

List of Drawings required Submission but not limited to	
SN	Drawings

1	GA drawings for All equipment / items to be supplied.
2	Equipment Detail Layout Drawings.
3	Electrical cable, conduit/ cable tray layout, Single line Diagrams
4	Automation Architecture, including Philosophy of Control and written Automation logic of plant.
5	Instrumentation cable, Single line Diagrams, Local panels, instrument locations, Instrumentation routes, etc to be provided

4. Superintendence, Team And Conduct

The Bidder/Supplier shall employ one or more competent representatives, whose name or names shall have previously been communicated in writing to the Purchaser by the Bidder/Supplier, to superintend the carrying out of the works on the site. The said representative or if more than one

shall be employed, then one of such representatives shall be4 present on the site during all times, and any orders or instructions which the Purchaser may give to the said representative of the Bidder/Supplier shall be deemed to have given to the Bidder/Supplier. The said representative shall have full technical capabilities and complete administrative and financial powers to expeditiously and efficiently execute the work under the contract.

The Bidder/Supplier shall, execute the works with due care and diligence within the time for completion and employ Bidder/Supplier's team comprising qualified and experienced engineers together with adequate skilled, semi-skilled and unskilled workmen in the site for carrying out the works. ThE Bidder/Supplier shall ensure adequate workforce to keep the required pace at all times as per the schedule of completion. Bidder/Supplier shall also ensure availability of competent engineers during commissioning/start up, trial runs, Operation of the plant/equipment till handing over of the plant.

The Bidder/Supplier shall furnish the details of qualifications and experience of their senior supervisors and engineers assigned to the work site, including their experience in supervising erection and commissioning of plant and equipment of comparable capacity.

When the Bidder/Supplier or Bidder/Supplier's representative is not present on any part of the work

where it may be desired to give directions in the event of emergencies, orders may be given by the Purchaser and shall be received and observed by the supervisors or foremen who may have charge of the particular part of the work in reference to which orders are given. Any such instructions, directions or notices given by the Purchaser shall be deemed given to the Bidder/Supplier.

The Bidder/Supplier shall furnish to the Purchaser a fortnightly labour force report showing by classifications the number of employees engaged in the work. The Bidder/Supplier's employment records shall include any reasonable information as may be required by the Purchaser. The Bidder/Supplier should also display necessary

information as may be required by statutory regulations.
None of the Bidder/Supplier's supervisors, engineers, or laborers may be withdrawn from the work without notice to the Purchaser and further no such withdrawals shall be made if in the opinion of the Purchaser, it will adversely affect the required pace of progress and/or the successful completion of the work.

The Purchaser shall be at liberty to object to any representative or person, skilled, semi-skilled or unskilled worker employed by the Bidder/Supplier in the execution of or otherwise about the works who shall, in the opinion of the Purchaser, misconduct himself or be incompetent, or negligent or unsuitable, and the Bidder/Supplier shall remove the person so objected to, upon receipt of notice in writing from the Purchaser and shall provide in that place a competent representative at Bidder/Supplier's own expense within a reasonable time.
In the execution of the works no persons other than the Bidder/Supplier, sub-Bidder/Supplier and their employees shall be allowed on the site except by the written permission of the Purchaser.

5. Purchaser's Instructions:

The Purchaser may, in his absolute discretion, issue from time to time drawings and/ or instructions, directions
and clarifications, which are collectively referred to as Purchaser's instructions in regard to:
. Any additional drawing and clarifications to exhibit or illustrate details.
.Variations or modifications of the design, quality or quantity of work or the additions or omissions or
substitution of any work.
. Any discrepancy in the drawings or between the schedule of quantities and/or specifications.
.Removal from the site of any material brought there by the Bidder/Supplier, which are unacceptable
to the Purchaser and the substitution of any other material thereof.
. Removal and/or re execution of any worker acted by the Bidder/Supplier, which are unacceptable to the Purchaser.
. Dismissal from the work of any persons employed there upon who shall in the opinion of the Purchaser, misconduct him, or be incompetent or negligent.
. Opening up for inspection of any work which is covered up.
. Amending and making good of any defects. Right Of The Purchaser

6. Right to direct works:
The Purchaser shall have the right to direct the manner in which all works under this contract shall be conducted, in so far as it may be necessary to secure the safe and proper progress and specified quality of the works. All work shall be done and all materials shall be furnished to the satisfaction and approval of the Purchaser. Whenever in the opinion of the Purchaser, the Bidder/Supplier has made marked departures from the schedule of completion or when circumstances or requirement force such a departure from the said schedule, the Purchaser, in order to ensure compliance with the schedule, shall direct the order, pace and method of conducting the work, which shall be adhered to by the Bidder/Supplier.

If in the judgment of the Purchaser, it becomes necessary at any time to accelerate the overall pace of the plant erection work, the Bidder/Supplier, when directed by Purchaser, shall cease work at any particular point and transfer Bidder/Supplier's men to such other point or points and execute such works, as may be directed by the Purchaser and at the discretion of the Purchaser.

7. Right to order modifications of methods and equipment:

If at any time the Bidder/Supplier's methods, materials or equipment appear to the Purchaser to

be unsafe, inefficient or inadequate for securing the safety of workmen or the public, the quality of work or the rate of progress required, the Purchaser may direct the Bidder/Supplier to ensure safety, and increase their efficiency and adequacy and the Bidder/Supplier shall promptly comply with such directives. If at any time the Bidder/Supplier's working force and equipment are inadequate in theopinion of the Purchaser, for securing the necessary progress as stipulated, the Bidder/Supplier shall if so

directed, increase the working force and equipment to such an extent as to give reasonable assurance of compliance with the schedule of completion. The absence of such demands from the Purchaser shall not relieve the Bidder/Supplier of Bidder/Supplier's obligations to secure the quality, the safe conducting of the work and the rate of progress required by the contract. The Bidder/Supplier alone shall be and remain liable and responsible for the safety, efficiency and adequacy of Bidder/Supplier's methods, materials, working force and equipment, irrespective of whether or not the Bidder/Supplier makes any changes as a result of any order or orders received from the Purchaser.

8. Right to inspect the work:

The Purchaser's representative shall be given full assistance in the form of the necessary tools, instruments, equipment and qualified operators to facilitate inspection. The Purchaser reserves the right to call for the original test certificates for all the materials used in the erection work. In the event the Purchaser's inspection reveals poor quality of work/materials, the Purchaser shall be at liberty to specify additional inspection procedures if required, to ascertain Bidder/Supplier's compliance with the specifications of erection work. Even though inspection is carried out by the Purchaser or Purchaser's representatives, such inspection shall not, however, relieve the Bidder/ Supplier of any or all responsibilities as per the contract, nor prejudice any claim, right or privilege which the Purchaser may have because of the use of defective or unsatisfactory materials or bad workmanship. Bidder/Supplier's Functions

The Bidder/Supplier shall provide everything necessary for proper execution of the works, according to the drawings, schedule of quantities and specifications taken together whether the same may or may not be particularly shown or described therein, provided that the same can reasonably be inferred there from and if the Bidder/Supplier finds any discrepancy therein, Bidder/Supplier shall immediately refer the same to the Purchaser whose decision shall be final and binding on the Bidder/Supplier.

The Bidder/Supplier shall proceed with the work to be performed under this contract in the best and workman like manner by engaging qualified and efficient workers and finish the work in strict conformance with the drawings and specifications and any changes/modifications thereof made by the Purchaser.
Variations

The Purchaser shall make any variation of the form, quality or quantity of the Works orany part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion be desirable, he shall have power to order the Bidder/Supplier to do and the Bidder/Supplier shall do any of the following:

. Increase or decrease the quantity of any work included in the contract,
. Omit any such work,

. Change the character or quality or kind of any such work,
. Change the levels, lines, position and dimensions of any part of the works
.Execute additional work of any kind necessary for the completion of the works and no such variation shall in any way vitiate or invalidate the contract, but the value, if any, of all such variations shall be taken into account in ascertaining the amount of the Contract price.

The Bidder/Supplier shall make no such variations without an order in writing of the Purchaser. Provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an order given under this clause, but is the result of the quantities exceeding or being less than those stated in the Contract/Bill of Quantities. Provided also that if for any reason the Purchaser shall consider it desirable to give any such order verbally, the Bidder/Supplier shall comply with such order and any confirmation in writing of such

verbal order given by the Purchaser, whether before or after the carrying out of the order, shall be deemed to be an order in writing within the meaning of this clause. Provided further that if the Bidder/Supplier shall within seven days confirm in writing to the Purchaser and the Purchaser shall not contradict such confirmation in writing within 14 days, it shall be deemed to be an order in writing by the Purchaser.

All extra or additional work done or work omitted by order of the Purchaser shall be valued at the rates

and prices set out in the contract if in the opinion of the Purchaser, the same shall be applicable. If the contract does not contain any Rates or prices applicable to the extra or additional work, then suitable rates or prices shall be agreed upon between the Purchaser and the Bidder/Supplier. Any Extra Work, carried out by the Bidder/Supplier would be at mutually agreed cost (Landed cost + 15% service charge).

Provided that if the nature or amount of any omission or addition relative to the nature or amount of the whole of the works or to any part thereof shall be such that, in the opinion of the Purchaser, the rate or price contained in the contract for any item of the works is, by reason of such omission or addition, rendered unreasonable or inapplicable, then a suitable rate or price shall be agreed upon between the Purchaser and the Bidder/Supplier. In the event of disagreement the Purchaser shall fix such other rate or price as shall, in his opinion, be reasonable and proper having regard to the circumstances.

Provided also that no increase or decrease mentioned above or variation of rate or price shall be made unless, as soon after the date of the order as is practicable and, in the case of extra or additional work, before the commencement of the work or as soon thereafter as is practicable, notice shall have been given in writing:
. By the Bidder/Supplier to the Purchaser of his intention to claim extra payment or a varied rate or price, or
. By the Purchaser to the Bidder/Supplier of his intention to vary a rate or price

If, on certified completion of the whole of the works, it shall be found that a reduction or increase greater than 15 per cent of the sum named in the Letter of Acceptance results from the aggregate effect of all Variation Orders but not from any other cause, the amount of the contract price shall be adjusted by such sum as may be agreed between the Bidder/Supplier and the Purchaser or, failing agreement, fixed by the Purchaser having regard to all material and relevant factors, including the Bidder/Supplier's site and general overhead costs of the contract.

The Bidder/Supplier shall send to the Purchaser's representative once in every month an account giving particulars, as full and detailed as possible, of all claims for any additional payment to which the Bidder/Supplier may consider himself entitled and of all extra or additional work ordered by the Purchaser which he has executed during the preceding month.

No final or interim claim for payment for any such work or expense will be considered which has not been included in such particulars. Provided always that the Purchaser shall be entitled to authorize

payment to be made for any such work or expense, notwithstanding the Bidder/Supplier's failure to comply with this condition, if the Bidder/Supplier has, at the earliest practicable opportunity, notified the Purchaser in writing that he intends to make a claim for such work.
The work shall be carried out as approved by the Purchaser or his authorized representative/s from time to time, keeping in view the overall schedule of completion of the project The Bidder/Supplier's job schedule must not disturb or interfere with Purchaser's or the other Bidder/Supplier's schedules of day-to-day work. The Purchaser will provide all reasonable assistance for carrying out the jobs.
Night work will be permitted only with prior approval of the Purchaser. The Purchaser may also direct the Bidder/Supplier to operate extra shifts over and above normal day shift to ensure completion of contract as per schedule. Adequate lighting wherever required should be provided by the Bidder/Supplier at no extra cost. The Bidder/Supplier should employ qualified electricians and wire-men for these facilities In case of Bidder/Supplier's failure to provide these facilities and personnel, the Purchaser has the right to arrange such facilities and personnel and to charge the cost thereof to the Bidder/Supplier.

In order to enable the Purchaser to arrange for insurance of all items received at the site including the items of supply covered under this contract, the Bidder/Supplier shall furnish necessary details of all the equipment immediately on its receipt at site, to the Purchaser. Any default on the part of the Bidder/Supplier due to which any item does not get covered under the insurance of the Purchaser; the cost of such equipment shall be charged to the Bidder/Supplier.

The Purchaser shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workman or other person in the employment of the Bidder/Supplier or any sub-Bidder/Supplier, save and except an accident or injury

resulting from any act or default of the Purchaser, his agents, or servants. The Bidder/Supplier shall
indemnify and keep indemnified the Purchaser against all such damages and compensation, save and except as aforesaid and against all claims, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto. Purchaser shall be liable for and shall indemnify bidder/supplier against all losses, expenses or claims in respect of loss of or damage to any physical property or of death or personal injury whenever occurring, to the extent caused by any negligence or breach of statutory duty of purchaser or its employees, contractors or agents.

The Bidder/Supplier shall ensure against such liability with an insurer approved by the Purchaser, which approval shall not be unreasonably withheld, and shall continue such insurance during the whole of the time that any persons are employed by him on the works shall, when required, produce to the Purchaser or Purchaser's representative such policy of insurance and the receipt for payment of the current premium. Provided always

that, in respect of any persons employed by any sub-Bidder/Supplier, the Bidder/Supplier's obligations to ensure as aforesaid under this sub-clause shall be satisfied if the sub- Bidder/Supplier shall have insured against the liability in respect of such persons in such manner that the Purchaser is indemnified under the policy, but the Bidder/Supplier shall require such sub-Bidder/Supplier to produce to the Purchaser or Purchaser's representative, when required such policy of insurance and the receipt for the payment of the current premium.

Whenever proper execution of the work under the contract depends on the jobs carried out by some other Bidder/Supplier, the Bidder/Supplier should inspect all such erection and installation jobs and report to the Purchaser regarding any defects or discrepancies. The Bidder/Supplier's failure to do so shall constitute as acceptance of the other Bidder/Supplier's installation/jobs as fit and proper for reception of Bidder/Supplier's works except those defects which may develop after execution. Bidder/Supplier should also report any discrepancy between the executed work and the drawings. The Bidder/Supplier shall extend all necessary help/cooperation to other Bidder/Suppliers working at the site in the interest of the work.

Bidder/Supplier shall carryout final adjustments of foundations, leveling and dressing of foundation surfaces, bedding and grouting of anchor bolts, bed plates etc. required for seating of equipment in proper position. The Bidder/Supplier shall be responsible for the reference lines and proper alignment of the equipment. However, all civil works like making cut-outs in walls, floors and ceilings for pipelines shall be done by the purchaser. Adjustment & leveling are to be carried out by the Bidder/Supplier at no extra cost. The Purchaser shall arrange the necessary refilling/repairs of these cut-outs and pockets. The Bidder/Supplier should arrange for laying the supports, cut-outs,

grouting of bolts, etc. When the civil works are in progress, so as to avoid refilling/repair works The Purchaser at Bidder/Supplier’s costs shall make the damages occurring to civil and other works good. For fixing of piping/equipment supports on wall/beams/roof floor etc., preferably anchor bolts shall be used by the Bidder/Supplier. Drilling of holes for fixing anchor bolts & supply of anchor bolts is in the scope of Bidder/Supplier without any extra cost. The Bidder/Supplier shall keep a check on deliveries of the equipment covered in the scope of erection work and shall advise the Purchaser well in advance regarding possible hold-up in Bidder/Supplier's work due to the likely delay in delivery of such equipment/components to enable him to take remedial actions.

9. Duties of the Bidder/Supplier Vis-à-Vis the Purchaser:

The equipment and the items, if any, to be supplied by the Purchaser for erection, testing and commissioning shall be as listed in the contract.

Besides the utilities/ services as specified in battery limits, Purchaser shall also provide the following assistance/ facilities to the Bidder/Supplier for carrying out the installation work:
Plant building ready for installation of equipment/items.

Necessary temporary water for carrying out the installation shall be supplied at only one point within the project site by the Purchaser free of charge. All necessary distribution tapings from this point onwards shall be the Bidder/Supplier's responsibility.

Necessary temporary power for carrying out the installation shall be arranged by theBidder/Supplier at Bidder/Supplier's own cost. The Purchaser on written request by the Bidder/Supplier will issue the necessary authorization letter.

The details of temporary water and power requirements shall be furnished one month in advance by the

Bidder/Supplier to enable the Purchaser to make timely arrangement.

If the Bidder/Supplier suffers delay and/or incurs costs from failure on the part of the purchaser to give possession of the civil works in accordance with the mutually agreed schedule, the purchaser shall determine.

. Any extension of time to which the Bidder/supplier is entitled due to delay caused by Purchaser.
. Any extension of time to which the Bidder/Supplier is entitled under respective clause of GCC
(General Conditions of Contract).

10. Supply Of Tools, Tackles And Materials:

The Bidder/Supplier shall, at his own expense, provide all the necessary equipment, tools and tackles, haulage power, consumables necessary for effective execution and completion of the works during erection and commissioning.

11. Protection Of Plant:

The Purchaser shall not be responsible or held liable for any damage to person or property consequent upon the use, misuse or failure of any erection tools and equipment used by the Bidder/Supplier or any of Bidder/Supplier's Sub-Bidder/Suppliers even though such tools and equipment may be furnished, rented or loaned to the Bidder/Supplier or any of Bidder/Supplier's Sub- Bidder/Suppliers. The acceptance and/or use of any such tools and equipment by the Bidder/Supplier or Bidder/Supplier's Sub-Bidder/Supplier shall be construed to mean that the Bidder/Supplier accepts all responsibility for and agrees to indemnify and save the Purchaser from any and all claims for said damageresulting from the said use, misuse or failure of such tools and equipments.

The Bidder/Supplier and Bidder/Supplier's Sub-Bidder/Supplier shall be responsible, during the works, for protection of work, which has been completed by other Bidder/Suppliers. Necessary care must be taken to see that the Bidder/Supplier's men cause no damage to the same during the course of execution of the work.

All other works completed or in progress as well as machinery and equipment that are liable to be damaged by the Bidder/Supplier's work shall be protected by the Bidder/Supplier and protection shall

remain and be maintained until the Purchaser directs its removal.

The Bidder/Supplier shall effectively protect from the effects of weather and from damages or defacement and shall cover appropriately, wherever required, all the works for their complete protection.

The Bidder/Supplier shall carry out the work without damage to any work and property adjacent to the area of Bidder/Supplier's work to whomsoever it may belong and without interference with the operation of existing machines or equipment.

Adequate lighting, guarding and watching at and near all the storage handling,

fabrication, pre-

assembly and erection sites for properly carrying out the work and for safety and security shall be provided by the Bidder/Supplier at Bidder/Supplier's cost. The Bidder/Supplier should adequately light the work area during nighttime also. The Bidder/Supplier should also engage adequate electricians/wiremen, helper etc to carry out and maintain these lighting facilities. If the Bidder/Supplier fails in this regard, the Purchaser may provide lighting facilities as he may deem necessary and charge the cost thereof to the Bidder/Supplier

The Bidder/Supplier shall take full responsibility for the care of the works or any section or portions there of until the date stated in the taking over certificate issued in respect thereof and in case any damage or loss shall happen to any portion of the works not taken over as aforesaid, from any cause what so ever, the same shall be made good by and at the sole cost of the Bidder/Supplier and to the satisfaction of the Purchaser. The Bidder/Supplier shall also be liable for any loss of or damage to the works occasioned by the Bidder/Supplier or the Bidder/Supplier's Sub- Bidder/Supplier in the course of any operations carried out by the Bidder/Supplier or by the Bidder/Supplier's Sub-Bidder/Suppliers for the purpose of completing any outstanding work or complying with the Bidder/Supplier's obligations.

12. Unloading, Transportation And Inspection:

The Bidder/Supplier shall be required to unload all the materials/equipment from the carriers, those received at site after Bidder/Supplier's team arrives at site. Bidder/Supplier shall be paid extra for unloading of the equipment being supplied by the purchaser whereas no extra payment for unloading of the equipment/piping shall be paid to Bidder/Supplier for the equipment being supplied by the Bidder/Supplier. The Bidder/Supplier shall plan in advance, based on the information received from the Purchaser, Bidder/Supplier's requirement of various tools, tackles, jacks, cranes, sleepers etc. required to unload the material/equipment promptly and efficiently. The Bidder/Supplier shall ensure that adequate and all measures necessary to avoid any damage whatsoever to the equipment at the time of unloading are taken.

Any demurrage/detention charges incurred due to the delay in unloading the material/equipment and releasing the carriers shall be charged to the Bidder/Supplier's account.

The Bidder/Supplier shall be responsible for the reception on site of all plant and Bidder/Supplier's equipment delivered for the purposes of the contract.

The Bidder/Supplier shall safely transport/shift the unloaded materials/equipment by the Bidder/Supplier to the storage area.

All the materials/equipment received by the Purchaser prior to arrival of the Bidder/Supplier at site shall be handed over to the Bidder/Supplier and there upon the Bidder/Supplier shall inspect the same and furnish the receipt to the Purchaser. The manner in which the inspection shall be carried out is enumerated below:

The materials/equipment would be carefully unpacked by opening the wooden cases/other modes of pickings as the case may be.

Detailed inventory of various items would be prepared clearly listing out the shortages, breakage/damages after checking the contents with respect to the Bidder/Supplier's packing list, the

Purchaser's purchase order and approved equipment drawings. The Bidder/Supplier shall also check each & every equipment for any shortage/shortcoming that may eventually create difficulty at the time of installation or commissioning.

All the information and observations by the Bidder/Supplier shall be furnished in the form of `INSPECTION REPORT' to the Purchaser with specific mention/suggestions which in the opinion of the Bidder/Supplier should be given due consideration and immediate necessary actions, to enable the Purchaser to arrange repair or replacement well in time and avoid delays due to non- availability of equipment and parts at the time of their actual need.

The inspection for all the equipment handed over to the Bidder/Supplier shall be completed within three week's period.

The protection, safety and security of the materials so taken over from the Purchaser shall be the responsibility of the Bidder/Supplier, until they are handed over to the Purchaser after erection, commissioning and testing as per the terms of the Contract.

13. Storage Of Equipment:

The Bidder/Supplier shall be responsible for the proper storage and maintenance of all materials/equipment under Bidder/Supplier's custody. However purchaser to provide with covered lockable area which can be used by Bidder/Supplier as site office or storage area for small costly items. Bidder/Supplier shall take all required steps to carry out frequent inspection of equipment/materials stored as well as erected equipment until the same are taken over by the Purchaser. The following procedure shall apply for the same.

The Bidder/Supplier’s inspector shall check stored and installed equipment/materials to observe signs of corrosion, damage to protective coating to parts, open ends in pipes, vessels and equipment, insulation resistance of electrical equipment etc. The Bidder/Supplier shall immediately

arrange a coat of protective painting whenever required. A record of all observations made on equipment, defects noticed shall be promptly communicated to the Purchaser and Purchaser's advice taken regarding the repairs/rectification. The Bidder/Supplier shall there upon carry out such repairs/ rectification at Bidder/Supplier’s own cost In case the Bidder/Supplier is not competent to carry

out such repairs/ rectification, the Purchaser reserves the right to get this done by other competent agencies at the Bidder/Supplier's responsibility and risk and the entire cost for the same shall be recovered from the Bidder/Supplier's bills.

The Bidder/Supplier's inspector shall also inspect and provide lubrication to the assembled equipment. The shafts of such equipment shall be periodically rotated to prevent rusting as well as to check freeness of the same.

The Inspector shall check for any signs of moisture or rusting in any equipment.

If the commissioning of equipment is delayed after installation of the equipment, the Bidder/Supplier shall carry out all protective measures suggested by the Purchaser during such period.

Adequate security measures shall be taken by the Bidder/Supplier to prevent theft and loss of materials handed over to the Bidder/Supplier by the Purchaser. The

Bidder/Supplier shall carry out periodical inventory checks of the materials received, stored and installed by the Bidder/Supplier and any loss noticed shall be immediately reported to the Purchaser. The Bidder/Supplier shall maintain a proper record of these inventories. The Bidder/Supplier should not sell, assign, mortgage, hypothecate or remove equipment or materials which has been installed or which may be necessary for completion of the work without the written consent of the Purchaser.

Suitable grease recommended for protection of surfaces against rusting (refined from petroleum oil with lanolin minimum (70 ^{0}C) and water in traces) shall be applied over all equipment as required once in every six months.

All equipment shall be stored inside a closed shed or in the open depending upon whether they are of indoor or outdoor design. The space heaters where provided into the electrical equipment shall be kept connected with power supply irrespective of their type of storage. Where space heaters are not provided adequate heating with bulb is recommended. For transformers heating of oil shall

be done by giving 440 V supply and short-circuiting the LT terminals. Frequent checks on insulation resistance are essential for all electrical equipment and record of the inspection reports and mugger readings shall be maintained equipment wise. Such records shall be presented to the Purchaser whenever demanded.
All the necessary items/goods required for the Bidder/Supplier as described above shall arrange protection and such cost shall be included in the Contract price.

14. Approvals:

The Bidder/Supplier shall obtain the necessary approvals of the Electrical Inspector, Weights & Measures Inspector, Explosive Inspector and any other state and local authorities as may be required and the cost of obtaining such approvals shall be included in the contract price.

The Bidder/Supplier will furnish all the necessary details, drawings, and submission of application and proofreads to the Purchaser for verification/ signature. The Bidder/Supplier on behalf of the Purchaser shall submit the necessary application duly filled-in, together with the prescribed fees to the appropriate authorities. However all the actual statutory prescribed fees paid

by the Bidder/Supplier shall be reimbursed by the Purchaser upon production of the receipt/vouchers.

The bidder shall arrange for approval from concerned statutory authority on be half of the UDS and the statutory fees shall be reimbursed by the UDS at actuals on production of receipts.

Bidder/Supplier shall provide all necessary documents/details to the Purchaser for obtaining the

necessary approval of concerned authority and related area.

15. Review & Co-Ordination of Erection Work:

The Bidder/Supplier shall depute senior and competent personnel to attend the site co-ordination meetings that would generally be held at the site every month or at such frequency as the purchaser may decide from time to

time. The Bidder/Supplier shall take necessary action to implement the decisions arrived at such meetings and shall also update the erection schedule.

16.Extension of Time for Completion:

Should the amount of extra or additional work of any kind or any cause of delay referred to in these conditions, or exceptional adverse climatic conditions, or other special circumstances of any kind whatsoever which may occur, other than through a default of the Bidder/Supplier, be such as fairly to entitle the Bidder/Supplier to an extension of time for the completion of the works, the Purchaser shall determine the amount of such extension and shall notify the Bidder/Supplier accordingly. Provided that the Purchaser is not bound to take into account any extra or additional work or other special circumstances unless the Bidder/Supplier has within twenty eight days after such work has been commenced, or such circumstances have arisen, or as soon thereafter as is practicable, submitted to the Purchaser full and detailed particulars of any extension of time to which he may consider himself entitled in order that such submission may be investigated at the time

Section I - Part III

Special Conditions Of Contract for Electrical Works

1.Scope:

The intent of this specification is to define the requirements for the installation, testing and commissioning of the electrical system like panels, power control cables, remote push button stations, motors, earthling network, etc Requirement of a particular project shall be as specified in schedule of quantities/approved drawings or as per the battery limits fixed in the contract. Bidder should note that specifications given under this scope are at broad level, the applicability shall be according to relevant work.

2. Standards:

The work shall be carried out in the best workmanship in conformity with this specification, the relevant specification/codes of practice of the Bureau of Indian Standards, approved drawings and the instructions issued by the Engineer-in-charge or his authorized representative, from time to time. Refer Some of the relevant Bureau of Indian Standards is listed in onwards table.
In addition to these standards, all works shall also confirm to the requirements of the followings: Indian Electricity Act and Rules framed there under.

3. Fire Insurance Regulations:

Regulations lay down by the Chief Electrical Inspector of the State/State Electricity Board.
Regulations lay down by the Factory Inspector of the State.
Any other regulations lay down by the local authorities.
Installation & operating manuals of original manufacturers of equipment. Equipment and Accessories Specifications
This defines specifications and requirements mainly for the equipment and accessories which are generally supplied by the erection agency and do not cover the specification of main electrical equipment such as Transformers, HT and LT panels, switchboards and motors etc which may be supplied by the Owner.
All materials, fittings and appliances to be supplied by the Bidder/Supplier shall be of best quality and shall conform to the specification given hereunder. The equipment shall be manufactured in accordance with current Bureau of Indian Standard Specifications wherever they exist or with the BS or NEMA specifications, if no such BIS are available. In the absence of any specification, the materials shall be as approved by the Owner or his authorized representative.
All similar materials and removable parts shall be uniform and interchangeable with one another.
You must furnish makes of bought out items.
Power Cables (HT)
Specifications as per table Power Cables (LT).
Specifications as per Section table Control Cables.
Specifications as per table Cable Trays.
Specifications as per table Cable Glands.
These shall be provided at both ends of armoured/ Unarmoured electrical cables. Cable glands to be manufactured as per performance requirements of BS 6121amended as on date, with BRASS material accurately machined and NICKEL finish. Single compression cable glands to be complete with checkout, gland body, 3 nose metal washers, and outer seal rubber ring and compression nut. Double compression glands to be complete with checkout, gland body, neoprene outer ring, Armour clamping cone, Armour clamping ring, Armour clamping nut, neoprene outer ring, skid washer & outer seal nut. Sample of cable gland to be got approved from the Site In charge before supply For instruments MOC of cable gland shall be polyamide.
Cable Connectors

Cable connectors, lugs/sockets, shall be of copper/Aluminium alloy, suitably tinned, soldering less, crimping type. These shall be suitable for the cable being connected and type of function (such as power, control or connection to instruments, etc.)

Cable Route Markers

These shall be galvanized Cast Iron plate with marking (LT/HT) diameter 150 mm with 600 mm long 25x25 mm MS. angle riveted/bolted with this plate. Sample to be got approved before use. Cable Indicators.

Individual symbols / numbers printed on yellow strips of glossy PVC should be used for cable indicator.

Pipes for Cables

For lying of cables under floor, G.I. class 'A' pipes shall be used. MS. conduits are acceptable for this purpose. For laying cable in air whereas cable trays are not being used, MS `B' class pipe shall be used. Size of pipe shall depend upon the overall diameter of cable to be drawn through pipe. To determine the size of pipe, assume that 40% area of pipe shall be free after drawing of cable. In dairy's process area wherever required SS-304 pipe, 1.6 mm thick shall be used.

Motor Isolators

These shall be in Aluminium cast housing, completely dust, vermin and weather proof (IP 55), suitable for 30/25 A, 415 volts, 50 Hz with rotary type switch complete with cable gland for incoming and outgoing cables. For dairy's process area SS-304 motor isolator shall be used. Final finish of housing to be buffer mirror for SS and powder coated gray for Aluminium housing. Sample to be got approved before supply.

Control Junction Box

These shall be in Aluminium cast housing, completely dust, vermin and weather proof (IP 55). For dairy's process area SS-304 junction box shall be used. Final finish of housing to be buffer mirror for SS and powder coated gray for Aluminum housing. Sample to be got approved before use.

Remote Push Button Stations

These shall be used for remote OFF for motors, away from MCC. These shall besuitable for surface/structure mounting in Cast Aluminium housing having IP-55 class of protection i.e. completely weather proof. For dairy's process area SS-304 push button shall be used. Final finish of housing to be buffer mirror for SS and powder coated gray for Aluminum housing. Sample to be got approved before supply.

Riveted type bi-colour plastic nameplate to be provided for each feeder.

For outdoor installation suitable canopy to be provided.

4. Erection of Equipment:

The cases containing the equipment (being supplied by the purchaser shall be handed over to the Bidder/Supplier. The Bidder/Supplier shall make his own arrangements for safe transportation of all the items to the erection site and also carry out complete loading/unloading duringtransportation. Equipment shall not be removed from packing cases unless the floor has been made ready for installing them. The cases shall be opened in presence of the Engineer-in-charge or his authorized representative. These empty packing cases shall be returned to the storage space identified by engineer in charge and any document if found with the equipment shall be handed over to the Engineer-in- charge. Any damage or shortage noticed shall be reported to the Engineer-in-charge in writing immediately after opening of packing cases.

Not Relevant in this tender Not Relevant in this tender Erection and Testing of Motors

Erection and coupling of motors with machines will be done under the mechanical erection. However, earthing, cable termination, testing and commissioning are covered under this section. Before starting, the alignment and coupling of motors with machines

and the insulation resistance of the motors will be measured and recorded by the Bidder/Supplier. The direction of the rotation of the motor shall also be checked before the driven equipment is finally coupled. Motor bearings are to be checked and rectified including supply and changing of grease if required, checking of fans coupling with bodies etc. The Bidder/Supplier shall take adequate precaution and care while executing the work. For all damage due to negligence etc. the Bidder/Supplier shall be responsible to replace/repair at his own cost.

Before connecting power cables to motors the insulation resistance of all motor windings shall be measured. Measurement shall be repeated after power cable terminations are completed and before first charging.
Motors shall be operationally tested together with the starting gear and auxiliary apparatus such as push button stations, the contractors, level and pressure controls, signal and alarm apparatus, power and control circuits etc.
Check the anti-condensation heater and its circuit (if installed).
Check the setting of the thermal overload protection / singl phase prevent or.Testing of these devices is to be done wherever required as per the instructions of the Engineer-in-charge.
Run all motors uncoupled for a maximum period of 4 hours before the driven equipment is placed in regular service. Fill up Test Certificate as per Table 3.
All outdoor-installed motors must be shrouded with cover made out of 14 gauge GI sheet with lifting hook and louvers as per norms
.

5. Installation of Cable Network:

Cable network shall include power, control and lighting cables which shall be laid in underground trenches, home pipes, open trenches, cable trays, GI pipes, or on building structure surfaces as detailed in the relevant drawings, cable schedules or as per the Engineer-in-charge's instructions. Supply and installation of cable trays, GI pipes/ conduits, cable gland sockets at both ends, isolators, junction boxes, remote push buttons stations, etc shall be under the scope of the Bidder/Supplier. For selection of cable size please refer onwards Table .

6. General Requirements for Handling of Cables:

Before laying cables, these shall be tested for physical damage, continuity absence of cross phasing, insulation resistance to earth and between conductors. Insulation resistance tests shall be carried out with 500/1000 volt Mugger.
The cables shall be supplied at site, wound on wooden drum as far as possible.For smaller length and sizes, cables in properly coiled form can be accepted. The cables shall lie by mounting the drum of the cable on drum carriage. Where the b carriage is not available, the drum shall be mounted on a properly supported axle, and the cable laid out from the top of the drum. In no case the cable will be rolled on, as it produces kinks, which may damage the conductor.
Sharp bending and kinking of cables shall be avoided. The bending radius for PVC insulated and sheath armoured cable shall not be less than 10 D Where `D' is overall diameter of the cable.
While drawing cables through GI pipes, conduits, RCC pipe, ensure that size of
pipe is such that, after drawing cables, 40 % area is free. After drawing cable, the end of pipe shall be sealed with cotton/bituminous compoun
High voltage (11 kV and above), medium voltage (230 V and above) and other control cables shall be separated from each other by adequate spacing or running through independent pipes/trays.
Armoured cables shall never be concealed in walls/floors/roads without GI pipes,

conduits RCC pipes .Joints in the cable throughout its length of lying shall be avoided as far as possible and if unavoidable, prior approval of site engineer shall be taken. If allowed, proper straight through epoxy resin type joint shall be made, without any additional cost. A minimum loop of 3 M shall be provided on both ends of the cable, or after every 50 M of uncounted length of cable and on both ends of straight through cable joint. This additional length shall be used for fresh termination in future. Cable for this loop shall be paid for supply and lying.

Cable shall be neatly arranged in the trenches/trays in such a manner so that crises crossing are avoided and final take off to the motor/switchgear is facilitated. Arrangement of cables within the trenches/trays shall be the responsibility of the Bidder/Supplier.

All cable routes shall be carefully measured and cable cut to the required lengths and undue wastage of cables to be avoided. The routes indicated in the drawings are indicative only and the same may be rechecked with the Engineer-in-charge before cutting of cables. While selecting cable routes, interference with structures, foundations, pipeline, future expansion of buildings, etc. should be avoided.
All temporary ends of cables must be protected against dirt and moisture to prevent damage to the insulation. For this purpose, ends of all PVC insulated cables shall be taped with an approved PVC or rubber insulating tape. Use of friction type or other fabric type tape is not permitted. Lead sheathed cable sshall be plumbed with lead allo

Wherever cable rises from underground/concrete trenches to motors/switchgears/push buttons, these shall be taken in G.I./MS pipes of suitable size, for mechanical protection unto 300 mm distance of concerned cable gland or as instructed by the Engineer-in-charge.

Where cables pass through foundation/walls of other underground structures, the necessary ducts or openings will be provided in advance for the same. However, should it become necessary to cut holes in existing foundations or structures the electrical Bidder/Supplier shall determine their location and obtain approval of the Engineer-in-charge before cutting is done.

Laying of Cables (Underground System)

Cables shall be so laid in ground that these will not interfere with other underground structures. All water pipes, sewage lines or other structures, which become exposed by excavation, shall be properly supported and protection from injury until the filling has been rammed solidly in places under and around them. Any telephone or other cables coming in the way are to be properly shielded diverted as directed by the Owner.

Cables shall be laid at minimum depth of 750 mm in case of LT & 1200 mm in case of HT, from ground level. Excavation will be generally in ordinary alluvial soil. The width of the trench shall be sufficient for lying of required number of cables.

Sand bedding 75 mm thick shall be made below and above the cables. A layer of bricks (full size) shall be laid on the edge, above sand bedding on the sides of cables and a flat brick to cover cable completely. More than one cable can be laid in the same trench by providing a brick on edge between two cables. However the relating location of cables in trench shall be maintained till termination. The surface of the ground after back filling the earth shall be made good so as to conform in all respects to the surrounded ground and to the entire satisfaction to the Engineer-in- charge.

For all underground cables, route markers should be used

Separate cable route markers should be used for LT, HT and telephone cables.

Route markers should be grounded in ground with 1:2:4 cement concrete pedestal size 230 x 230 x 300 mm.

Cable markers should be installed at an interval not exceeding 50 M along the straight routes of cables at a distance of 0.5 M away from centre of cable with the arrow marked on the cable markers plate indicating the location of cable. Cable markers should also be used to identify change in direction of cable route and for location of every joint in underground cable.

RCC Hume pipe for crossing road in cable laying shall be provided by Owner. No deduction shall be made for cable lying in home pipe for not providing bricks, sand and excavation. RCC home pipe at the ends shall be sealed by bituminous compound after laying and testing of cable by electrical Bidder/Supplier without any extra charge.

Laying of Cables under Floors

GI class a pipe shall be used for lying of outgoing cables under floors from distribution boards to motors, isolators/junction boxes of motors, starter of motors and push button stations. Preferably
one cable shall be drawn throughone pipe. Size of pipe shall be such that after drawing of cable 40
% area is free. If length of pipe is more than 30 M, free area may be increased to 50 %.

Use of elbows is not allowed at all and number of bends shall be kept minimum. Instead of using bends with sockets, pipe-bending machine shall be used for making long smooth bends at site.

Ends of pipe shall be sealed temporarily while laying with cotton/ jute/ rubber stopper etc to avoid entry of building material.

Exact location of equipment motor/ isolator/ push buttons etc shall be ascertained prior to lying of pipe.
Laying of Cable in Masonry Trenches
Masonry/ concrete trenches for lying of cable shall be provided by Owner. However steel members such as MS angles/ flats etc shall be provided & grouted by electrical Bidder/Supplier to support the cables

without any extra charge. Cables shall be clamped to these supports with Aluminium saddles/ clamps. More than one tier of cables can be provided in the same trench if the number of cables is more. If required cable trays can also be provided in trenches.
Entry of cables in trenches shall be sealed with bituminous MASTIC compound to stop entry of water in trenches.

Laying of Cables in Cable Trays

Cable trays and supporting steel members such as MS angle/ channel/ flats etc shall be provided and fixed by the Bidder/Supplier.

Cables shall be fixed in cable trays in single tier formation and cables shall be clamped with Aluminium flat clamps and galvanized bolts/unit.

Earthing flat/ wire can also be laid in cable tray along with cables. After lying of cables

minimum 20 % area shall be spare.
Laying of Cables on Building Surface/ Structure

Such type of cable lying shall be avoided as far as possible and will be allowed only for individual cables or small group of cables, which run along structure.

Cables shall be rigidly supported on structural steel/masonry using individual cast/malleable iron galvanized saddles and these supports shall be approximately 400 to 500 mm for cables unto 25 mm overall diameter and maximum 1000 mm for cables larger than 25 mm. Unsightly sagging of cables shall be revenged. Only/GI clamps with GI bolts/nuts shall be used.

If drilling of steel structure must be resorted to, approval must be secured from the Engineer-in- charge and steel must be drilled where the minimum weakening of the structure will result.

Termination & Jointing of Cables

Use of Glands: All PVC cable unto 1.1 kV grade, armoured or Unarmoured shall be terminated at the equipment/junction box/ isolators/push buttons/control accessories, etc. by means of suitable size single/double compression type cable glands. Armour of cable shall be connected to earth point. The Bidder/Supplier shall drill holes for fixing glands wherever necessary. Wherever threaded cable gland is to be screwed into threaded opening of different size, suitable galvanized threaded reducing bushing shall be used for approved type.

In case of termination of cables at the bottom of the panel over a cable trench having no access from the bottom, a close fit holes should be drilled in the bottom plate for all the cables in one line, then bottom plate should be split in two parts along the centre line of holes. After installation of bottom plate and cables with glands, it shall be sealed with cold sealing compound.

Use of Lugs/ Sockets: All cable leads shall be terminated at the equipment terminals, by means of crimped type solder less connectors unless the terminals at the equipment ends are suitable for direct connecting without lugs/sockets.

The following is the recommended procedure for crimped joints and the same shall be followed: Strip off the insulation of the cable end with every precaution, not to severe or damage any strand. All insulation to be removed from the stripped portion of the conductor and ends of the insulation should be clean and square.

The cable should be kept clean as far as possible before assembling it with the terminal/socket. For pre Ingress of moisture and possibility of re-oxidation after crimping of the aluminum conductors, the socket should be fitted with corrosion inhibiting compound. This compound should also be applied over the stripped portion of the conductor and the palm surface of socket. Correct size and type of socket/ ferrule/ lug should be selected depending on size of conductor and type of connection to be made. Make the crimped joint by suitable crimping tool. If after crimping the conductor in sock lug, some portion of the conductor remains without insulation the same should becovered sufficiently with PVC tape.

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Dressing of Cable inside the Equipment

After fixing of cable glands, the individual cores of cable shall be dressed and taken along the cableways (if provided) or shall be fixed to the panels with polyethylene straps. Cable

shall be dressed in such a manner that small loop of each core is available inside the panel.

For motors of 20 HP and above, terminal box if found not suitable for properdressing of Aluminium cables, the Bidder/Supplier shall modify the same without any additional cost. Cables inside the equipment shall be measured and paid for.

Identification of Cables/ Wires/ Cores

Power cables shall be identified with red, yellow & blue PVC tapes for trip circuits identification, additional red ferrules shall be used only in the particular cores of control cable at the termination points in the switchgear/control panels and control switches.

In case of control cables all cores shall be identified at both ends by their wire numbers by means of PVC ferrules or self-sticking cable markers, wire numbersshall be as per schematic/connection drawing. For power circuit also wire numbers shall be provided if required as per the drawings of switchgear manufacturer.

Cable between Isolators/ Junction box & Motors/ Controls

Wherever possible Copper cables with glands shall be used between isolator/junction box (installed near motor/controls) and motors/controls. If terminal box of the motor or control switch is not suitable for accepting armoured cable or it is difficult to lay, copper conductor, multi-core, Unarmoured flexible cable in PVC flexible conduit steel (reinforced) with flexible conduit glands shall be used.

Testing of Cables

Before energizing, the insulation resistance of every circuit shall be measured from phase to phase and from phase to ground. This requires 3 measurements if one side is grounded and 6 measurements for 3 phase circuits.

Where splices or terminations are required in circuits rated above 650 volts, measure insulation resistance of each length of cable before splicing and/or terminating. Report measurements after splices and/or terminations are complete.

DC High Voltage test shall be made after installation on all 1100 Volts gradecables in which straight through joints have been made and all cables above 1100 V grade.

For record purposes test data shall include the measured values of leakage current versus time. The DC High Voltage test shall be performed as required.

Cables shall be installed in final position with the entire straight through jointscomplete. Terminations shall be kept unfinished so that motors, switchgear, transformer etc are not subjected to test voltage.

31.6 The test voltage and duration shall be as per relevant codes and practices of Indian Standards Institution. Fill up the Test Certificate as required.

7. Earthing Network:

The entire earthing installation shall be done in accordance with the earthing drawings, specification and instructions of the Engineer-in-charge. The entire earthing system shall fully comply with the Indian Electricity Act and Rules framed there under.

The Bidder/Supplier shall carry out any changes desired by the electrical inspector or the Owner in order to make the installation conform to the Indian Electricity Rules, at no extra cost. The exact location of the earth pits, earth electrode and conductors and earthing points of the equipments shall be determined at site, in consultation with the Engineer-in-charge. Any change in

the methods, routing, size of conductor etc. shall be subject to approval of the owner/engineer-in-charge before execution.

Earth Pit with Electrode

Plate or pipe type earth electrode with earth pit shall be provided for this workunless otherwise advised by the Engineer-in-charge due to typical site conditions.Earthing electrode and pit shall be as per IS: 3043-1966 (code of practices for Earthing). All earth electrodes shall preferably be driven to a sufficient depth to reach permanent moist soil.

Prior approval of the engineer-in-charge shall be taken for selecting type of earth electrode (pipe or plate).

Earth pit centre shall be at a minimum distance of 2 m from nearest building,unless otherwise advised. The minimum 3 m distance shall be maintainedbetween centres of 2 earth pits.

Earth Bus, Earthing Lead & Earth Wire/ Strip

All electrical equipment is to be doubly earthed by connecting two-earth strip/wire conductor from the frame of the equipment to an earthing pit/ main earthing ring. The earthing ring will be connected via links to several earth electrodes. The cable armoured will be earthed through the cable glands.Conductor size for connection to various equipments shall be as specified in the drawing or as instructed by the Engineer-in-charge. However, the length of thebranch leads from equipment to earthing grid/ ring shall not be more than 10 to15 meters.

All hardware for earthing installation shall be hot dip galvanized. Spring washers shall be used for all earthing connections of equipment having vibrations.

Size of earthing lead/ wire shall be as specified in schedule of quantities/ drawings. Table 6 may be considered as general guidelines.
When earthing wire is to be drawn under floor/in underground, Aluminium wire 10 mm dial. With PVC insulation shall be used. Instead of GI wire, PVC insulated copper conductor wires can also be used.

However, while deciding type & size of earth lead, the resistance between the earthing system and the general mass of the earth shall be as per IS code of practice. The earth loop impedance to any point in the electrical system shall not be in excess of 1.0 ohms in order to ensure satisfactory operation of protective devices.

wire/ Aluminium wire shall be connected to the equipment by providing crimping type socket/ lug.
Wherever earthing strip to be provided in cable tray, it shall be suitably bolted on cable tray and electrically bonded to the cable tray at regular interval.

Excavating & refilling of earth, necessary for laying underground earth bus loops shall be the responsibility of the Bidder/Supplier.

Wherever earth leads/ strips/ wire are laid in cable trenches, these shall be firmly and suitably cleared to the walls/ supporting steel structure on which cable is clamped.

The neutral of the transformer shall ben connected to earth pit independently and earth pit shall have copper earth plate.

Long runs of GI strip shall be connected at each end with lap type welding to ensure continuity. Erection Procedure Guidelines of Instrumentation & Control System

The erection of Instrumentation & Control System shall be carried out generally conforming to General Technical Standards as described herein. However, the Bidder shall select and adopt methods and procedures for equipment erection to suit the nature of equipment and erection work, involved according to the best modern practice and his own experience. Shop tests as well as Site tests shall be performed to ensure that all equipment / sub-systems / systems furnished are manufactured and tested conforming to the requirements of the specification and approved Quality

Assurance Program. All assembly and erection procedures adopted by the supplier shall be open for

inspection and approval by the Client. Acceptance of erection procedures shall not in any way relieve the supplier of his responsibility for proper erection of the equipment.

Transmitters, converters and pressure & temperature switches shall generally be installed on Instrument Stands made of 2" SS pipes located at convenient points. Level transmitters shall normally be flanged for direct mounting in the tank / equipment.

Temperature / Pressure Stub on equipment and pipelines shall preferably be of same material or higher grade of material Suitable Root Valves shall be provided with every tap-off point.

Installation of Pressure and Differential Pressure Transmitter shall be as per standard engineering practice incorporating Drain Valves, Isolation Valves, 2/3-Valve Manifold, Syphon etc. as applicable.

For instrument air, SS. Pipe shall be used for air distribution from Battery Limit to the designated point of use. Take-off connections to instruments / actuators shall be with suitable size nipples and shut-off valves. Individual air supply shall be provided by 6 mm OD PU tube through an isolating needle valve and air filter regulator.

Perforated Aluminium Trays (minimum 2 mm thick) shall be utilized for routing of signal tubing / cables in field. All cables / tubes in the supporting trays / channels shall be tagged properly. The loading of the cable trays shall not exceed 60 % of the available space. Proper gap between the electrical trays, as per the voltage level, shall be maintained in the cable tray layout. Tray numbers shall be provided at suitable intervals.

Rigid and flexible conduits along with necessary fittings shall be used for cable laying from instrument to JB or instrument to trays etc.

Table 1 Bureau of Indian Standards (BIS)		
SN	Description	BIS
1	PVC insulated cables (light duty) for working voltage unto 1100 volts	694-1977 Part I
2	PVC insulated cables (heavy duty) for voltage unto 1100 volts	1554-1976 Part I
3	-- Do -- for voltage 3.3 kV to 11 kV	1554-1976 Part II
4	Specification for polyethylene insulated PVC sheathed heavy duty electric	5959-1970 Part I
5	-- Do -- voltage 3.3 kV to 11 kV	5959-1970 Part II
6	Guide for marking of insulated conductors	5578-1970
7	Code of practice for installation and maintenance of paper insulated power	1255-1967
8	Code of practice for earthing	3043-1966
9	Guide for safety procedures and practices in electrical work	5216-1969
10	Code of practice for installation and maintenance of AC induction motor	5214-1969
11	Code of practice for installation and maintenance of induction motors	900-1965
12	Code of practice for installation and maintenance of switchgears	372-1975
13	Code of practice for installation and maintenance of transformers	1886-1967
14	Code of practice for electrical wiring installation, voltage not exceeding 650 V	732-1963
15	Code of practice for electrical wiring installation (system voltage exceeding	2274-1963
16	Guide for testing three phase induction motor	4029-1967

Table 2 Pro forma for PCC, DB, Motor Control Centres Test		
SN	Test	Report
1	Circuit(Breaker/Bidder/Supplier Module Designation/Bus	
2	Insulation resistance (Contacts open, breaker Racked in position)	
a.	Between each Phase & Bus (Mega Ohm)	
b.	Between each phase and earth (Mega Ohm)	
c.	DC and AC control & auxiliary circuits (Mega Ohm)	
d.	Between each phase of CT/PT and between CT & PT circuit if	
3	CT Checks	
a.	CT ratio	
b.	CT secondary resistance	
c.	CT polarity check	
4	Check for contact alignment and wipe	
5	Check/test all releases/ relays	
6	Check mechanical interlocks	
7	Check electrical interlocks	
8	Check switchgear/control panel wiring	
9	Checking breaker/Bidder/Supplier circuits for	
a.	Closing- local and remote (wherever applicable)	
b.	Tripping-local and remote (wherever applicable)	
10	Opening time of breaker/ contactor	
11	Closing time of breaker/ contactor	
Signature and seal of Engineer-in-charge of UDS, Ujjain		Signature and seal of Engineer-in-charge of Bidder/Supplier

B	Y Phase Amps	
C	B Phase Amps	
6	Temperature rise after 4 hours run	
A	On no load degree C	
B	On full load degree C	
C	Ambient temperature during test degree C	
7	Operation of thermal overload relay	
A	At normal Full Load current of motor	
B	At twice Full Load current of motor trips in Seconds	
Signature and seal of Engineer-in-charge Of UDS,Ujjain		Signature and seal of Engineer-in-charge of Bidder/Supplier

Table 4 Pro forma for Testing Cables		
Sr No	Test	Report
1	Date of Test	
2	Drum Number (from which cable is	
3	Cable From -> To	
4	Length of run of this cable (meter)	
5	Insulation resistance test (In Mega Ohm)	
A	Voltage of Megger Volts	
B	Between core-1 to earth	
C	Between core-2 to earth	
D	Between core-3 to earth	
E	Between core-1 to core-2	
F	Between Core-2 to Core-3	
G	Between Core-3 to Core-1	
6	High Voltage Test (Voltage Duration)	
A	Between Cores and Earth	
B	Between Individual Cores	
Signature and seal of Engineer-in-charge of UDS, Ujjain.		Signature and seal of Engineer-in- charge of Bidder/Supplier

Table 5 Recommended Cables Sizes For Industrial Wiring				
3 Ø 415 V Motor HP	Aluminium Conductor Cable Size (in mm^2)			
	Rotor Resistance Starter		Star Delta Starter	
	Supply side	Motor Side (2 Cables)	Supply side	Motor Side (2 Cables)
10	6	6	6	4
15	10	10	10	4
20	16	16	16	6
25, 30	25	25	25	10
40	35	35	35	16
50	50	50	50	25
60	70	70	70	35
75	95	95	95	50
100	120	120	120	70
125	150	150	150	95
150	225	225	225	120
180	300	300	300	150
215	300	300	300	185

Table 6 Sizing of Earthing Lead/ Wire		
Sr No	ITEM	Size
1	Control switches	G.I. wire 14 SWG
2	Motor unto 10 HP	G.I. wire 8 SWG
3	Motor above 10 HP unto 125 HP	G.I. strip 25 x 3 mm
4	Motor above 125 HP	G.I. strip 25 x 6 mm
5	Switch Board	G.I. strip 25 x 6 mm
6	Power control centre/ LT panel of sub-station	G.I. strip 40 x 6 mm

Section-1

SPECIAL CONDITIONS OF CONTRACT FOR MECHANICAL WORKS
PART – IV

1. MECHANICAL INSTALLATION:

The installation work would comprise:

1.0. General installation i.e. positioning and installing all the processing, miscellaneous and service equipment as per approved layout drawings and as per the contract.
2.0. Supply and installation of structural platforms and tables.
3.0. Supply and installation of all service and product piping including ancillary items.
4.0. Interconnections of services and electrical with equipment.
5.0 Insulation and cladding of piping and equipment including supply of materials.
6.0 Guideline for expansion work
7.0. Supply of all cleaning chemicals (except CIP chemicals) and lubricants.
8.0. Clean up of work site
9.0. Painting including supply of paints as approved by the Owner.
10.0. Testing, commissioning, and start-up.
11.0. Training of personnel.

1.0 GENERAL INSTALLATION

Positioning of Equipment

The work involves preparation of access for moving of the plant and equipment including their fittings from the work site godown or from the place within the site where they have been unloaded, to the place of erection, decorating and placing on the foundation wherever required. All the civil foundations as per the manufacturer/supplier's drawings shall be arranged by the Owner. The Supplier shall place the equipment and carry out final adjustment of the foundations including alignment and dressing of foundation surface, embedding, and grouting of anchor bolts and bedplates. The Supplier shall be responsible for obtaining correct reference lines for purpose of fixing the alignment of various equipment from master benchmarks provided by the Owner.

Tolerances shall be as specified in equipment manufacturers drawings or as stipulated by the Owner's Engineer. No equipment shall be permanently bolted down to foundations or structure until the alignment has been checked by the Supplier and witnessed by the Purchaser. The Supplier shall carry out minor alterations in the anchor bolts, pockets etc., at no extra cost and set the equipment properly as per approved layout, drawings, and manufacturer's instructions. The Supplier shall supply all the necessary foundation/anchor bolts and bedplates if required without extra cost.

The Supplier shall supply, fix and maintain, at his own cost, during the erection work, all the necessary centering, scaffolding, staging required not only for proper execution and protection of the said work but also for protection of the surrounding plant and equipment. The Supplier shall take out and remove any or all such centering, scaffolding, staging planking etc., as occasion shall require or when ordered to do so and shall fully rein-state and make good all things disturbed during execution of the work, to the satisfaction of the Owner. The Supplier shall be paid no additional amount for the above.

2.0 Structural Platforms, Service Pipe Bridge and Tables

Structural platforms shall be required to provide access for various equipment's. Pipe support bridges/gantry shall be required for supporting the pipes from the ground, including road crossings outside the buildings. Tables shall be required for handling milk/milk products. These platforms, bridges/gantry and tables shall be fabricated keeping stability and other functional as well as aesthetic requirements into consideration as approved by the Owner. The payment shall be made on the basis of the actual weight executed and the unit rates agreed upon or as per provisions made in the contract for such items.

The supplier shall arrange for any civil works required for the above works based on the drawings

and load details as per the design and engineering offered by the bidder. Necessary templates and other accessories required by the civil contractor shall be provided by the bidder.

3.0 SERVICE PIPING INSTALLATION

General Guidelines

All piping systems shall comply with the latest editions of the following regulations wherever applicable.

Regulations of explosives inspectorate.

All applicable Indian Standards.

All applicable State Government/Central Government laws/acts.

The successful Tenderer has to prepare all erection drawings of the proposed plant including equipment positions and service-piping positions (Isometric), spacing between pipes, all other relevant details and submit these drawings to USDS for approval.

3.1. Scope of Supply

The Supplier shall supply all piping materials like pipes, fittings, flanges measuring instruments and all other items as shown in the flow diagram/specifications and schedule of quantities. All the pipes & fittings and insulation material etc. should be of class and make as approved by the Owner. Prior approval of the Owner must be obtained by the Supplier for the class and make of all materials. The Supplier should furnish the details of makes selected by him.

3.2 Scope of Piping Erection:

This to be performed by the Supplier as outlined below:

The scope of erection for piping, includes all system covered in the flow diagrams and specifications.

The Supplier's work commences/terminates at the pipe connections with valves or flanges as specified
in flow diagrams/battery limits.

The Supplier shall also install necessary piping and any specialties furnished with or for equipment

such as relief valves, built-in-pass and other items of this type.

The Supplier shall install primary elements for flow measurements, control valves and on-line
metering equipment.

The Supplier shall perform necessary internal machining of pipes for installing orifices, flow nozzles,
control valves etc.

The Supplier shall install all pipes, valves and specialties being procured from other sources.

3.2. Testing of Piping

The Supplier shall test all piping/ ducting systems as required including valves and specialties and instruments as per procedure laid down.

All piping shall be internally cleaned and flushed by the Supplier after erection in a manner suited to the
service and as directed by the Owner.

For hydrostatic testing and water flushing, the Supplier shall furnish necessary pumps, equipment, instruments and piping etc.

Color code shall be used to identify pipe material. The Supplier shall be able to identify on request all random piping prior to field fabrication.

The Supplier shall be responsible for the quality of welding done by them and shall conduct tests to
determine the suitability of the welding procedure by him.

All piping supports, guides, anchors, hangers, rollers with structural framework shall be supplied and erected by the Supplier. Only anchor fasteners of adequate size shall be provided for support from RCC structures and Helmet Gun shall be used for fastening the anchors. The kind of pipe supports like CI clamps, wooden saddles, roller supports and support framework shall be as per the design approved by the Owner prior to taking up the work.

All piping shall be suspended, guided, and anchored with due regard to general requirements and to avoid interference with other pipes, hangers, electrical conduits and their supports, structural embers and equipment and to accommodate insulation and conform to buildings structural limitations. It is the responsibility to the piping Supplier to avoid all interference while locating hangers and supports.

Anchors and/or guides for pipelines or for other purposes shall be furnished, when specified, for holding the pipeline in position for alignment. Hangers shall be designed fabricated and assembled in such a manner that they cannot become disengaged by any movement of the support pipes.
49.0 All piping shall be wire brushed and purged with air blast to remove all rust, mill scale from inner surface. The method of cleaning shall be such that no material is left on the inner or on outer surfaces, which will affect the service-ability of the pipes.

Effective precautions such as capping, and sealing shall be taken to protect all pipe

ends against ingress of dirt and damage during transit or storage. The outside of the steel pipes (black) shall be painted with two coats of red oxide paint or as directed by the Owner.

All pipes in the corridor shall be supported from the sidewall.

Pipe support shall be of steel, adjustable for height and primers coated with rust preventive paints and finish coated with dark admiral grey of approved shade. Where pipes and clamps are of dis- similar material, gaskets shall be provided in between. Pacing of pipe supports shall not exceed the following:

3.3. Pipe size Spacing between supports

Up to 12mm	1.5m
15 to 25mm	2.0m
30 to 150mm	2.0m
Over 150mm	2.5m

Vertical risers shall be parallel to walls and column lines and shall be straight and plumb. Risers passing from floor to floor shall be supported at each floor slab by clamps or collars attached to pipe and with a 15mm thick rubber pad or any resilient material. Where pipes pass through the terrace floor, suitable flashing shall be provided to prevent water leakage. Risers shall have a suitable clean out at a lower point and air vent at the highest point.

Pipe sleeves at least 3mm thick, 50mm/100mm larger in diameter than the pipes shall be provided wherever pipe passes through walls and slabs. Annular space shall be filled with fibre glass and finished with retainer rings. No extra payment shall be made on account of providing the sleeves.

All piping works shall be carried out in a workman like manner, causing minimum disturbance to the services, buildings, roads and structures. The entire piping work shall be organized, in consultation with other agencies work, so that laying of pipe support, pipes and pressure testing for each area shall be carried out in one stretch.

Cutouts details in the floors and slabs for installing various pipe are to be provided by the contractor immediately after receipt of the purchase order, so as to make the cutouts ready by civil contractor.
The contractor shall make sure that the clamps, brackets, clamp saddles and hangers provided for pipe supports are adequate. Piping layout shall take due care for expansion and contraction in pipes include expansion joints wherever required.

All pipes shall be accurately cut to the required size in accordance with the relevant BIS code and burrs removed before laying. Open ends of the piping shall be closed as the pipe is installed to avoid entrance of foreign matters. Where reducers are to be made in horizontal runs, eccentric reducers shall be used for piping to drain fully. In other locations concentric reducers may be used.

All buried pipes shall be cleaned and coated with zinc chromate primer and bitumen paint, then wrapped with three layers of fiber glass tissue, each layer laid in bitumen.

Auto purge valve shall be provided with all high points in the piping system for venting. Air valve shall be 15mm, pipe size valves with screwed joints. Discharge from the air valves shall be piped through an equal size mild steel, hot galvanised pipe to the nearest drain or sump. These pipes shall be pitched towards drain point.

Tee-off connections shall be through equal or reducing tees. Otherwise ferrules welded to the main pipe shall be used. Drilling and tapping of the walls of the main pipe shall not be resorted to.

3.4.SPECIAL INSTRUCTIONS AND SPECIFICATIONS

Steam Piping

Steam piping work can be classified into two categories:

High-pressure steam piping when the working pressure of steam is more than3.1 kg/sq.cm (50 psi).

Low-pressure steam piping when the working pressure of steam is below 3.1 kg/sq.cm (50 psi).

All the pipes and fittings used for high pressure steam piping work should conform to IBR and they should be IBR certified and also to be identified with number and mark showing that they are tested by the Boiler Inspector and supported with duly authentic certificates to this effect. ALL HIGH PRESSURE STEAM PIPES SHALL BE SEAMLESS TYPE, AS PER IS-CODE.

The high pressure steam piping after installation should be hydraulically tested in presence of the Boiler Inspector for his approval.

The high-pressure steam piping work should also include fabrication and installation of
pressure reducing stations strictly conforming to IBR.

Chilled Water Piping:

All the piping for chilled water, ammonia, soft and raw water, steam pipes and air shall generally of welded construction. Whenever welding is done for pipes of smaller size special care should be exercised to avoid clogging of flow area with the welding material.

SS Piping;

Generally all SS piping for process and CIP shall be of welded construction. However, SMS unions may be used as per process requirements or as directed by the Engineer-in-charge. The overhead and ground pipe supports for SS piping shall be of SS square sections of suitable wall thickness. The accessories like nipples, clamps, base plates etc. are included in the scope of this package shall be provided by the supplier.

Pipe supports for straight length of SS piping are to be provided at suitable distances as instructed by Engineer-in-charge to avoid any sag or hang in the pipelines.

PROCUDURE TO BE ADOPTED FOR SS WELDING

The SS pipes shall be cut square and joints to be prepared without damage to the electro polishing of the pipes.
The welding shall be done using TIG welding procedure with inert gas masking to prevent

oxidation of the joints.

The joints then shall be cleaned using proper abrasive material such as 3Mabrasive weld cleaning cloth so that proper polishing is maintained at the weld joints.

Weld penetration of the inner side of the pipe shall be avoided.

4.0. INTER CONNECTIONS OF SERVICE AND ELECTRICALS WITH EQUIPMENT

The Supplier shall lay service piping and provide connections with the equipment complying strictly with the equipment manufacturers' instructions. The Supplier shall also carry out all the interconnecting service piping with the various items of plant/system. The work shall be complete with capillary piping if required and connections with instruments and controls supplied with the equipment.

The Supplier shall also carry out electrical connections for equipment with the control panels including equipment lighting as per the wiring diagrams of the equipment suppliers.

Connection shall be made for small electrically operated devices on equipment installed as accessories to, or assembled with equipment. Connections regarding instruments, float switches, limit switches, pressure switches, thermostats and other miscellaneous equipment shall be done as per manufacturers' drawings & instructions.

5.0. INSULATION OF PIPING AND EQUIPMENT

Insulation of Chilled Water and Ammonia Pipeline

All the chilled water pipelines shall be insulated by expanded polystyrene or polyurethane foam or any other high-grade insulation acceptable to the Purchaser. This insulation could be in pre- formed sections or cast in situ. The insulation with pre-formed sections shall be carried out in the following manner.

Before starting insulation work all pipelines shall be tested for 8.5 kg/sq. compressor.

The surface of the pipes to be insulated should be properly cleaned.

Hot bitumen of 85/40 or 85/25 conforming to IS 702 should be applied uniformly @1.5 kg per sq.m.on
the surface of the pipes.

A similar layer of bitumen should be applied on the inner surface and on the edgesof the insulation
sections.

The sections should then be stuck to the coated pipes with joints staggered. Adjacent sections
should be tightly pressed together.

All joints should be properly sealed with bitumen.

A thick vapour seal of hot bitumen @ 2.5 kg/sq. cm should be applied uniformly onthe outer surfaces of
the pipe sections and allowed to dry.

In case the insulation sweats or the specified/required insulation properties are not attained, the
entire insulation in such region shall be redone with fresh material, entirely at the Supplier's cost.

The thickness of insulation may be as per Annexure II.

Note: In situ insulation shall be carried out as per standard procedure.

Insulation of Steam and Hot Water Pipe Lines

All the steam and hot water pipelines shall be insulated with mineral wool or equivalent of specified thickness. The insulation shall be carried out in the following manner and should be supplied in the form of properly required sizes.

Clean the surfaces to be insulated. Apply a coat of red oxide primer and fix glass wool/ mineral wool of specified thickness, tightly to the pipes, butting all joints and tie with lacing wire.

It should then be covered with GI wire netting of 20 mm x 24 SWG.

In case the insulation does not have the desired insulation properties, the entireinsulation will have to be redone at the Supplier's cost to give the desired results.

In case of condensate return piping all the steps mentioned above shall beexecuted except that thickness of the insulation shall be 25 mm.

Aluminium/GI Cladding

The chilled water, ammonia, water, & hot water lines after insulations shall becovered by Aluminium/GI cladding the payment will be made as per the executed items.

Aluminium cladding will be done with 22-gauge aluminum sheet with proper roves and overlaps and screwed in position with 12 mm. self- tapping parker screws.

GI sheet cladding will be done with 22 gauge sheet with proper grooves and overlaps and screwed in position with 12 mm self tapping.

The GI sheet cladding will finally painted 2 (coats) by approved shade and quality of paint.

All the necessary materials of quantity and make approved by the Owner, required for carrying out insulation, cladding and other works mentioned above, shall be supplied by the Supplier.

6.0. GUIDELINES FOR EXPANSION WORK

Shutdowns

Plant shutdown shall be required for making tapings/interconnections of the new equipment proposed to be installed under expansion with the existing equipment. These shut downs should be planned carefully well in advance to enable the Owner to take suitable actions for ensuring normal Plant operations. The details of shut downs; the numbers and duration should be worked out and intimated to the Owner for

approval. The Supplier should ensure completion of all the necessary works well within the allowed time so that no inconvenience is caused in regular operation and working of the existing plant.

Cleanliness

Wherever the Supplier is required to work in existing plant area he should take due care and extra precautions to ensure absolute cleanliness and minimum hindrance for proper working of the existing plant.

Change over

The program for change over from existing plant system to new plant system should be prepared by the Supplier and should be got approved by the Owner.

Modifications and rectifications of existing plant and equipment

During expansion work, the Supplier shall be required to carry out modifications, repairs/replacement of the existing equipment. The alterations/modifications not specified in the contract/order and or minor in nature requiring not more than 24man-hours for each item, will be carried out by the Supplier without any extra cost. However, if the modifications are of major nature

and if not specified in the Contract/order, the Supplier shall be paid for such works based on man- hour rates.

7.0.SUPPLY OF CLEANING CHEMICALS AND LUBRICANTS

The necessary quantities of cleaning chemicals (except CIP chemicals) and the first charge of oil and lubricants required for the installation, commissioning, testing and start-up of all the equipment till handing over are to be supplied by the Supplier and nothing extra would be paid for these.

8.0.CLEAN UP OF WORKS SITE

All soils, filth or other matters of an offensive nature taken out of any trench, drainor other places shall not be deposited on the surfaces, but shall at once be carted away by the Supplier from the site of work for proper disposal.

The Supplier shall not store or place the equipment, materials or erection tools onthe drive ways and passages and shall take care that his work in no way restricts or impedes traffic or passage of men and materials during erection. The Supplier shall without any additional payment, at all time keep the working and storage area used by him free from accumulation of dust or combustible materials, waste materials rubbish packing, wooden planks to avoid fire hazards and hindrance to other works.

If the Supplier fails to comply with these requirements in spite of written instructions from the Owner, the Owner will proceed to clear these areas and the expenses incurred by the Owner in this regard shall be payable by the Supplier. Before completion of the work, the Supplier shall remove or dispose off in a satisfactory manner all scaffolding, temporary structures, waste and debris and leave the promises in a condition satisfactory to the Owner. Any packing materials received with the equipment shall remain as the property of the owner and may be used by the Supplier on payment of standard charges to the Owner and with prior approval of the Owner. At the completion of his work and before final payment, the Supplier shall remove and shall restore the site

to neat workman like conditions at his cost.

9.0. PAINTING INCLUDING SUPPLY OF PAINTS AS APPROVED BY PURCHASER

All the equipment/machineries like motors, pumps, HT/LT panel, transformer, switch boards, starters, junction boxes, isolators, storage tanks, supporting structures, pipe supports and MS/GI pipes and all exposed and visible iron parts included in the scope of erection/commissioning shall be given double coat of paint of approved shade over a double coat of anti-corrosive primer wherever necessary irrespective of the condition of original paint of equipment/machineries/ structures/supports. All surfaces wherever required must be properly cleaned from scale, dirt and grease prior to painting. Spray painting must preferably be used on all the equipment/machineries and wherever practicable. Suitable and necessary cleaning/ wiping of sight/dial glasses, other non-metallic parts, flooring, walls and other surfaces which have been spoiled by paint during painting must also be carried out by the Supplier.

Lettering and other markings, including capacity and flow direction markings, shall also be carried out by the Supplier on the tanks, pipe lines, starters, motors, isolators and wherever else necessary, as directed and as per the standard practice of installation. ISI colour codes and colour charts as mentioned below:

Table 1 Painting of Equipment & Structural Work		
SN	Item	Painting Shade
1	All Storage tanks with outer MS	Bright yellow Shade No 632 of ISI
2	All M.S. platforms/pipe supports/ pipe bridges and any other structures	Dark Admiral grey shade No.632 of ISI
3	Water Pumps & Motor	Original colour
4	HT & LT panels	Original colour
5	LT distribution switchboards	Dark admiral grey
6	Fuel Handling Equipment FO NG	 Black Yellow
7	Evaporative type Ammonia Condenser	Smoke Grey

Table 2

Colour Code For Pipelines as per BIS 2379-1963

SN	Services	Ground Colour	First Band	Second Band
1	Cold Water	Sea Green 217	French Blue 166	-
2	Boiler Feed Water		Parrot Green	-
3	Condensate		Light Brown 410	-
4	Hot Water		Light Brown 410	-
5	Drinking Water		French Blue 166	Signal Red 37
6	Treated Water		Light Orange 557	-
7	Untreated Water		White	-
9	Compressed Air	Sky Blue 101		
10	Vacuum		Black	
11	Steam	Silver Grey 628	Original colour	
12	Diesel	Light Brown 410	Brilliant 221	
13	Lubricating Oil		Light Grey 631	
14	Drainage	Black		
15	Fire Hydrant	PO Red		

Table 3 Testing Pressures for Various Pipelines					
Sr No	Name	Test Pressure kg/cm2	Test medium	Duration of Test (Hour)	Allowable pressure Drop (kg/cm2)
1	H.P.Steam pipe lines	27	Water	1/2	0
2	L.P.Steam pipe lines	8	Water	1/2	0
3	Water pipe lines1	8	Water	1/2	0
4	Furnace oil/ LSHS	16	Water	½	0
5	MS pipes for dairy	6	Water	1/2	0
6	Air	12	Air	8	0.1
7	Ammonia pipe lines				
7a	Suction 16	16	N2	24	0.2
7b	Discharge	24	N2	24	0.2
7c	Vacuum Test of Ammonia Lines	Absolute Zero	Vacuum	48	NIL

Supply of all paints and all other materials required is included in the scope of supply of the Supplier under this contract/order.

10.0.TESTING, COMMISSIONING AND START-UP

The Supplier shall operate, maintain and give satisfactory trial run of the plant in such manner and for such periods as has been specified in Technical Specifications.

The commissioning shall also include the following for each equipment:

Field dis-assembly and assembly of equipment, instruments and controls where required for access to fixing or adjustment.

Clean out of lubrication system including chemical cleaning wherever required.

Circulation of lubricant to check flow.

Clean out and check out of all the service lines.

Check out and commissioning of instruments, equipment and plants, filtering of transformer and other oils so that if deteriorated, they shall attain the required properties/standards, specified tests in this regard carried out by approved authorities and their satisfactory reports submitted to the Owner before start-up.

Recharging or make-up filling of lubricant oil up to the desired level in the lubrication system of individual machine.

Operation in empty condition to check general operation details wherever required and wherever possible Closed loop dynamic testing with water wherever required.

Operation under load and gradual load increase to attain maximum rated output.

Trouble shooting during the trial period.

The Supplier shall demonstrate proper working of all mechanical and electrical controls; safety and protective device, in presence of the Owner's engineer and the same should be duly recorded.

Commissioning of automation system:

The supplier should provide a detailed schedule of testing all automation and control systems. 144.0All controlled or monitoring devices on the plant should be tested from the relevant control
centre and recorded to be operating as designed, including feed back detection.

A log of these operations is to be maintained, and each completed group of tests to be signed by the supplier's commissioning engineer.

The purchaser reserves the right to witness as much of these test procedures, as he may feel necessary.

Testing procedures and commissioning period will be as specified in respective Section.

After conducting testing, in case a particular equipment is not working properly or not giving rated output the Supplier will furnish a detailed report to the Owner stating therein the detailed account on the performance of the equipment with possible reasons for improper or not working of the same.

After satisfactory commissioning and start-up, the Supplier shall keep/depute his representatives at the plant in the manner, for the duration and for the performance of such tasks as specified in respective clause.

11.0. TRAINING OF PERSONNEL

Necessary staff as may be deputed by the Owner shall be trained by the Supplier for operating the plant. The personnel will be associated for the training during the installation; testing, commissioning and start-up period and the training tenure shall be extended for a minimum period of six months from the date of commissioning and start-up. This training will be a continuous process during commissioning and stand by period and as described in the Technical Specifications.
Detailed specifications are given in the subsequent clauses.

Section II -

1.0. Project introduction.
2.0. Work scope.
3.0. Design basis and technical specifications.
4.0. Scope of supply/ BOQ.

1.0. PROJECT-INTRODUCTION:

Ujjain Sahakari Dugdha Sangh, Ujjain is intent to install a new gas(high and low pressure) cum oil fired Boiler of 4000 Kgs per hour capacity(design pressure of 17.5 kgs) for continuous processing and manufacturing of milk and milk products. The job requirement is to design, engineering, supply of 4000 Kgs PH capacity steam generating Boiler along with equipment and accessories, civil construction materials, Mild Steel and labour job for construction and fabrication of complete Boiler house installation, testing, commissioning, successful trial run and training to staff/ operator, to be installed at main dairy plant of USDS.
Bidder to visit the USDS main dairy plant to take required details from concerned officials for the location where the new boiler is to be installed to make actual assessment for civil construction, fabrication work and for piping and cabling.

2.0. WORK SCOPE: It includes Design, Supply, installation, testing, commissioning, trial run and training of 4TPH capacity Boiler with following equipment and accessories:

1. Complete Boiler house with civil foundations and MS structure shed as per design requirement of Boiler, equipment/ accessories and piping offered by the bidder, providing proper space and for operation on dual system of fuel ie. Gas/oil, Boiler cleaning/ maintenance and ventilation for cross air circulation.
2. Boiler model capable of generating 4000 kg/hr of steam 100 deg.cel. with working pressure as 17.5
kg/cm2 working on Natural Gas fuel as well as Furness oil with all equipment and accessories as offered
and required by bidder.
3. Day tank for water (10KL).
4. Furnace oil storage tank-10 kl.
5. Day tank for FO- it will be insulated and provided with steam heating and condensate out.
6. Air Pre Heater suitable for Boiler.
7. Gas train for Natural gas suitable for 4000 kgs/hr steam generating Boiler.
8. Chimney 30.5 Mtr of height suitable for above Boiler (As per IBR norms).
9. Interconnecting Duct between Boiler to APH to Chimney.
10. Soft water storage tank of 10 KL Capacity.
11. All water, drain, vent and blow down piping.
12. Installation of new steam pipeline up to the processing, Ghee, Butter, RMRD and any other existing
sections where ever required in main dairy plant.
13. All Electrical Work both for power cabling existing PCC to MCC of Boiler and up to motors along with
Boiler House shed complete with illumination.
14. Civil Foundations for Boiler & Chimney, Plate forms , Ladder & Catwalk for Boiler.
15. Suitable capacity De-Mineralized water treatment plant for above Boiler.
16. Insulation of Boiler & Pipelines up to main plant.
17. Suitable Pressure Reducing Station for existing processing/ production sections in main dairy plant
18. Insulation of Boiler & Pipelines up to main plant.
19. Boiler registration and approval from Boiler Inspector as per IBR guidelines.
20. Annual Maintenance counteract on mutual agreed terms after completion and handing

over of Boiler for regular operation. Bidder to provide terms and conditions of the agreement.

3.0. DESIGN BASIS AND TECHNICAL SPECIFICATIONS.

INPUT- DATA:

1) FUEL :-

Furnace oil / Natural Gas as specified in the IS- 1593 as following.

1) Net calorific value – 9650 Kcal/kg
2) Flash point -- 60 - 70 deg c
3) Water content -- 1%vol . (max)
4) Kinematic viscosity -- 250 cst @ 50 deg c(max)
5) Pour point -- 15 deg c
6) Sediment -- 0.25 %
7) Sulphur -- 4.5 % (max)
8) Contradson carbon -- 4% .

Natural Gas (With composition % by VOL as given below)

1) CH4 -- 76%
2) C2H6 -- 10%
3) C3H8 -- 2%
4) N2 -- 6%
5) CO2 -- 6%

Net calorific value -- 8500 Kcal/ Nm^3
Density -- 0.91 Kg/Nm^3
Maximum Inlet Press -- 500 mbar

2) WATER :-

Raw water specification:

Perticulars of test	Test Parameters	Remark
Water hardness	400 to 500 PPM Maximum	In case of requirement of any micro analysis for designing the De-mineralization plant, bidder can contact concerned USDS official for drawing water sample and can arrange testing at his own level.
Total dissolved solids	400 mg/L	

Feed water specifications:

-Should be as per IS 10392 –1982/ design requirement/ considering the operating economics.

-Bidder to propose any treatment scheme, in case required for water in Boiler feed tank, apart from water already treated in De- mineralization plant, for maintaining the Ph/ alkalinity level .

-Bidder to ensure required elevation level of Feed water tank to avoid loss of heat in case of condensate recovery
system provided in future.

POWER :-

Supply voltage3 ph, 4 wire, 415 / 380 + 6 % V and 50 + 3 % Hz
Control voltage 240 / 220 V, A.C., 1 ph
Note - Control supply one phase to be drawn form the three phase supply line with the neutral .

EFFICIENCY :-

- Bidder to design the system to providing adequate heat recoveries in order to ensure maximum
efficiency of Boiler and its economical operation.
-Efficiency shall be demonstrated as per the standard BS: 845 Part 1 - indirect method.

PERTICULARS OF BASIS	UNITS	DESIGN/ TECHNICAL DETAILS
GENERAL		
Boiler Type		Three pass wet back smoke tube boiler
Design Code		IBR 1950 (With latest amendment)
Steam Output F & A 100 ^{0} C	kg / hr	4000
Design Pressure	kg / cm^2(g)	17.5
Safety Valve Set Pressure	kg / cm^2(g)	17.5
Thermal Efficiency on NCV	%	Bidder to provide
Dryness Fraction	%	Bidder to provide
Heat Output	10^6kcal/hr	Bidder to provide
Volumetric Heat Release Rate	10^6kcal/hr.m^3	Bidder to provide
FUEL		
Type		Light Diesel oil cum N gas (high/ low pressure)
NCV of Light Diesel Oil	kcal/kg	10200
NCV of N gas	Kcal/Nm3	8500
BURNER Type		Bidder to provide
Light Up		Bidder to provide
Fuel Supply Pressure(LDO)	kg / cm^2g	Bidder to provide
Turn Down (Oil cum gas / gas)		Bidder to provide
Modulation type (Oil cum gas/gas)		Bidder to provide
F.D.FAN Type		Bidder to provide
Flow	m^3/hr	Bidder to provide
Head (at 20^o C & at sea level)	mmwc	Bidder to provide
Arrangement		Bidder to provide
FEED WATER PUMP		
Type		Bidder to provide

Flow	**m^3/hr**	**Bidder to provide**
Head	**MLC**	**Bidder to provide**
FUEL PUMP		
Type		**Bidder to provide**
Flow	**LPH**	**Bidder to provide**
Discharge Pressure	**kg / cm^2g**	**Bidder to provide**
Power		**415/380 Volts + 6% ; 50 Hz + 3% ; 3 Ph,3 / 4 Wire**
UTILITIES CONSUMPTION		
Light Diesel Oil	**kg/hr**	**Bidder to provide**
N gas	**Nm3 / hr**	**Bidder to provide**
Power	**KW**	**Bidder to provide**
Water	**Liters**	**Bidder to provide**
Air	**Kg/M3**	**Bidder to provide**

4.0. SCOPE OF SUPPLY/ BOQ (Includes design, engineering and supply)

A. Boiler (4000 kgs per hour steam generation capacity) and it's accessories:

S.NO.	NAME OF EQUIPMENT/ ACCESSORIES	PERTICULARS	QTY.	UNIT
01	**PRESSURE PART ASSEMBLY**	consisting of the Full fusion welded shell consisting of wet back furnace and two sets of convection smoke tubes, hinged ceramic lined front doors and smoke chamber with soot cleaning door. One Manhole, Two head holes on the boiler shell to inspect the internal of the boiler. One access opening at the back of the IRC to inspect the internal of the furnace. Two fusible plugs are provided as an ultimate mechanical safety to prevent the boiler from over heating in case of very extra low water level in boiler.	01	Lot
02.	**OIL CUM GAS FIRED BURNER**	Pressure jet spill return step less modulation burner with the high voltage spark ignition/Pilot flame for burner light up. Burner should be suitable for firing LDO/ Natural gas(Both for low and high pressure) one at a time. Pressure gauge at inlet & outlet with isolation valve & syphon for oil pressure sensing. Flame sensor is provided in the burner to detect the flame in auto mode operation.	01	Lot

03	**FUEL OIL PUMPING UNIT**	Fuel oil gear pump with motor. With Isolating ball valves at inlet and outlet	02	Set
04	**AIR /OIL/GAS REGULATING ASSEMBLY**	Damper assembly with step motor & cam linkages with oil regulating valve to control oil flow rate to the burner. Separate cam for gas .Proper support frame to be provided to mount the Air regulating assembly.	01	Lot
05	**FORCED DRAFT COMBUSTION AIR FAN**	Backward curved design Forced draft combustion air fan with the motor & flexible duct at the suction & discharge of the fan to prevent the other components from any vibration. Arrangement to be provided to connect the Air regulating assembly at the suction of the fan.	01	Lot
06	**FEED WATER PUMPS**	Highly efficient Centrifugal multi-stage, vertical feed water pumps with motor, Impellers & shaft of the pump should be of stainless steel with Mechanical Seal.	02	Set
07	**CONTROL PANEL BOX ASSEMBLY**	**Panel box :** **A - Power cum control panel:** **The power & control section should be physically isolated with partition plate. The power section to be provided with a main incomer Isolating switch with MCCB. The required switch gears for all the feeders to be housed in the power section. Burner management system along with necessary start stop button, auxiliary contactor, control circuit, indication lamps & hooter for the alarm are housed in the control section.** **- Temp indicator & switch is provided in the control panel to indicate the boiler stack temp to give high stack temp alarm , lamp indication & burner trip interlock.** **- One Sequence controller for burner management**	01	Lot

		system to be provided. **B- FIELD MOUNTED INSTRUMENTS:** **Should have as follows:** **Pressure switch for stepless modulation. - 01** **Pressure switch for burner ON/OFF control. - 01** **Temperature element for flue gas temperature- 01** **Pressure switch to sense low combustion air** **pressure-01**		
08	**ACCESSORIES**	**Air ducting:** **Set of M.S ducting to connect the burner to F.D.Fan. - 01** **Piping:** **Set of Natural gas piping from gas train to burner inlet.-01** **Set of feed piping to connect feed water pumps to the boiler.-01**	01	Lot
09	**SET OF VALVE MOUNTINGS AND FITTINGS**	**.** **BOILER SHOULD HAVE FOLLOWING :** **Main steam stop valve.-01** **Spring loaded single port safety valves.-02** **Air vent valve. -01** **Blow down valve.-01** **Main steam pressure gauge.-01** **Explosion door for protection against high flue gas pressure.-01** **plain tubular gauge glasses along with inbuilt isolation and drain valves.- 02** **Float operated magnetic water level controller,-02** **Isolation valves for Main steam pressure gauge , Inspector pr gauge & Isolation valve and drain valve for two float operated level controller. -08** **<u>Structure</u>** **Boiler should have Set of ladder & catwalk to operate the valves & fittings mounted. 01 Set**		
09	**FUEL OIL FILTER**	**Duplex type basket filter with suitable filter element.**	01`	

<table>
<tr><td>10</td><td>GAS TRAIN SUITABLE FOR OPERATION OF HIGH OR LOW PRESSURE GAS</td><td>Consisting of:
Isolating ball valve on main line.-01
Gas filter-01
Pressure gauge each at upstream &down stream of the pressure regulator with push to read valves.-02
Gas pressure regulator.-01
Safety shutoff valve -01
Relief valve with isolation ball valve -01
Low gas pressure switch -01
Solenoid Valves-02
Solenoid valve on pilot line-01</td><td></td><td></td></tr>
<tr><td>11.</td><td>BOILER SAFETIES</td><td>Should be provided as follows:
<table>
<tr><th>Safety features/ Unsafe conditions</th><th>Instrument</th><th>Action</th></tr>
<tr><td>(a) Low water level in the boiler #</td><td>Level controller-1</td><td>Alarm & burner trip</td></tr>
<tr><td>(b) Extra low water level in the boiler</td><td>Level controller -2</td><td>Alarm & burner trip</td></tr>
<tr><td>(c) Very extra low level</td><td>Fusible plug</td><td>Fusible plug blow & burner trip</td></tr>
<tr><td>(d) Flame failure</td><td>Flame sensor</td><td>Alarm & burner trip</td></tr>
<tr><td>(e) Steam pressure high</td><td>Safety valve</td><td>Lift</td></tr>
<tr><td>(f) Stack temp high</td><td>Temperature switch</td><td>Alarm & burner trip</td></tr>
<tr><td>(g) Gas pressure low</td><td>Pressure switch</td><td>Alarm & burner trip</td></tr>
<tr><td>(h) combustion air pressure low</td><td>Pressure switch</td><td>Alarm & burner trip</td></tr>
</table></td><td></td><td></td></tr>
</table>

		Note – **1. For avoiding the dry run of the boiler feed water pump , it has to be provided with the potential free contact of the extra low level switch of the soft water tank , to be hooked up in the boiler control panel.** **02. Suitable provision is to be made in the Boiler control panel to trip the main fuel pump in case of ring main pump pressure is low to avoid burner inlet pressure fluctuations**		
B. Other accessories:				
01		**Day MS tank with epoxy painted for water (10KL).**	01	No.
02		**Furnace oil storage tank-10 kl.**	01	No.
03		**Day tank of suitable capacity for FO- it will be insulated and provided with steam heating and condensate out.**	01	No.
04		**Air Pre Heater suitable for Boiler.**	01	Set
05		**Chimney 30.5 Mtr of height suitable for above Boiler (As per IBR norms) with all other accessories for complete installation including round ladder up to required height for drawing samples of out going hot gases.**	01	Lot
06		**Interconnecting Duct between Boiler to APH to Chimney.**	01	Lot
07		**Soft water storage tank (MS) of 10 KL Capacity.**	01	Lot
08		**All water, drain, vent and blow down piping.**	01	Lot
09		**New steam pipeline up to the processing, Ghee, Butter, RMRD and any other existing working sections where ever required in main dairy plant**	01	Lot
11		**Suitable capacity De-Mineralized water treatment plant for above Boiler.**	01	No.
12		**Insulation materials for Boiler & Pipelines up to main plant.**	01	Lot
13		**Suitable Pressure Reducing Station for existing processing/ production sections in main dairy plant.**	01	Set
C	**ELECTRICAL WORK:**			
	A.	**Electrical materials for power cabling from existing PCC to MCC and motors of Boiler.**		

	B.	**Electrical materials for complete illumination of Boiler shed.**		
D. CIVIL CONSTRUCTION MATERIAL, STELL AND MILD STEEL FOR BOILER HOUSE				
01	Civil and fabrication materials.	**Civil construction materials and Mild Steel for construction of Complete Boiler house with civil foundations for Boiler & Chimney and Stell/ Mild Steel for civil structure of shed, Plate forms , Ladder & Catwalk as per design requirement of Boiler, equipment/ accessories, space for operation and piping offered by the bidder..**	01	Lot

E	**LABOUR JOB FOR CONSTRUCTION, INSTALLATION, TESTING, COMMISSIONING, SUCCESSFUL TRIAL RUN AND TRAINING OF 4000 KGS PER HOUR CAPACITY GAS/ OIL (DUAL) FIRED BOILER.**	
01	**MECHANICAL JOB**	**Complete installation, testing, commissioning, trial run, training to USDS staff of 4000 kgs per hour capacity Boiler along with it's equipment and accessories as mentioned in the design, engineering and supply under A,B,C.(scope of supply)**
02	**CIVIL CONSTRUCTION AND MECHANICAL JOB**	**Civil construction work for Complete Boiler house with civil foundations for Boiler & Chimney and Mild Steel fabrication work for shed, Plate forms , Ladder & Catwalk as per design requirement of Boiler, equipment/ accessories, space for operation and piping offered by the bidder..**
03	**ANNUAL MAINTANANCE CONTERECT**	**Annual Maintenance counteract (subject to on mutual agreed terms) after completion and handing over of Boiler for regular operation. Bidder to provide terms and conditions of the agreement.**
04	**IBR APPROVAL AND REGISTRATION**	**Boiler registration and approval from Boiler Inspector as per IBR guidelines.**

Sub section- 4 A-Battery Limits –Suggested	
1	Feed water: Bidder to install pipe line from nearest available Header for Taking raw water To De mineralization plant and ahead.
2	Steam: Up to production block of all sections through PRS.
3	Steam: outlet flange of steam safety valve.
4	Fuel: inlet of gas train
5	Flue gas: Inlet of chimney
6	Electrical power :Bidder to take power supply from PCC by providing required electrical equipment and cable to connect to MCC and motors of Boiler.
7	Civil construction and fabrication of Boiler hose- all in Bidder's scope

Sub section- 4-B- Preferred Make :Thermax/Forbes marshall/ Industrial Boilers Ltd/Ross Boilers Ltd/ energy industrial Boiler Ltd.			
1	Burner Mono -bloc	Nuway/ Weishaut/ Saacke/ Oilan/ Forbes Marshall	To be mentioned
2	Feed Water pump	Burner Manufacturer's standard	To be mentioned
3	Blower	Burner Manufacturer's standard	To be mentioned
4	Sequence controller	Burner Manufacturer's standard	To be mentioned
5	Photocell	Burner Manufacturer's standard	To be mentioned
6	Mobrey level controller	Malhotra/OEM	To be mentioned
7	Pressure gauges	Forbes Marshall/Fiebeg/OEM	To be mentioned
8	Electrical switch gears	Siemens/ L&T /ABB/Schneider	To be mentioned
9	Cables	Polycab/Finolex	To be mentioned
10	MCB	Siemens/L&T	To be mentioned
11	Pressure switches	Indfoss/OEM	To be mentioned
12	Water level indicator	Teleflo/Tectrol/Leader/OEM	To be mentioned
13	Main steam stop valve & mobrey isolation valve	Forbes Marshall/ Uniklinger/BDK /Leader/OEM	To be mentioned
14	Steam and water valves	Forbes Marshall/ Uniklinger/BDK /Leader/OEM	To be mentioned
15	Safety valve	Fainger Lesser/Sempell/ Leader/OEM/ Forbes Marshall	To be mentioned
16	Blow down valve	Levcon/Leader/OEM	To be mentioned

17	Non Return valve	Spirax Marshall/ Leader/OEM/ Forbes Marshall	To be mentioned
18	Fusible plugs		To be mentioned

Sub-Section 5- Responsibilities

1. RESPONSIBILITIES OF BIDDER

1. Developing the process design, complete engineering design, manufacturing and/or supply of respective equipment/goods/services as per the technical specifications and ensuring best performance of individual equipment/ systems/ operation as a whole. The bidder shall avail the assistance of reputed specialists in the respective field wherever required as well as past experiences gained during installation/ commissioning of the projects.

2. Providing technical data, technical literature

3. Arranging for approvals from various Statutory Authorities on behalf of the Purchaser. The statutory fees will be reimbursed by Purchaser on production of receipt.

4. First charge oil/lubricants.

5. Execution of project in accordance with prevailing Indian standards IER & IS wherever applicable & relevant to this project.

6. Testing and commissioning satisfactorily and performance of all equipment in bidder's scope and after sales service at mutually agreed terms.

7. Test equipment, test kits, instrumentation and materials required for establishing performance parameters.

8. Provide necessary manpower during positioning, pre-commissioning, testing and commissioning along with tests.

9. Testing, commissioning of the system under scope as per agreed performance parameters and utility consumption.

10. Training Purchaser's personnel in the field of instrumentation automation, management system, plant operation & control, maintenance & repair of systems & equipment.
Dry Chemical Powder type fire extinguishers shall be provided at strategic points by supplier as per requirement.

2. **PURCHASER**.

1. Documents on local site conditions related to climate, access and communications.
Water: Water shall be provided by Purchaser at Free of Cost at one Point.

2. Power: Shall be provided on chargeable basis .

3. Permanent water and power supply at the time of pre-commissioning of the plant.

4. Adequate staff including operators, supervisors and engineers for product trials.

5. Provision of and cost of services, raw products, packaging materials

6. Timely provision of personnel for training.

7. Provide open storage area, lockable store during erection and commissioning of project. Suitable Site
fabrication area.

8. Payment as per agreed terms and conditions.

9. Approval of drawing

Sub - Section 5

PROJECT MANAGEMENT

TIME SCHEDULE

Project execution shall be scheduled to mutually agreed time bound program, which should not exceed as specified in the IFB from the date of signing of

contract to commencement of trials and service load trials. The Project Manager of bidder will provide all the details to the Project Manager of the Purchaser with timely expediting and progress reports, which clearly indicate the actual vs., planned progress and the new likely completion dates of supply, erection, and commissioning and product trials.
The bidder shall provide project-staffing pattern before commencement of work and should include sufficient personnel to meet the execution time schedule.

MANAGEMENT TEAM

A Project Engineer shall be assigned by the bidder for day to day operation and co-ordination, and to ensure successful and satisfactory design, procurement, manufacture, inspection, erection, testing and commissioning of all the equipment/ facilities/ systems within the time bound schedule.

The Project Manager/consultant of USDS and Project Engineer shall attend technical and review through discussions/ if required in meeting between various parties involved the project, and ensure implementation of all decision taken in the meetings.
The Project Manager of supplier shall also be responsible for detailed material accounting at site and management of project materials and equipment stored at site.
The USDS will nominate a Project Manager with whom the Project Manager of Supplier shall communicate/co-ordinate

APPROVAL

Purchaser shall give approval on technical documentation at the earliest after submission. Amendments, due to technical/ operational reasons, shall be taken up by the supplier, and shall be binding on the supplier.
Supplier shall obtain approval for purchase of specific makes of equipment whose makes are not mentioned in his offer. If two or more makes of equipment are mentioned in the form of alternatives in the approved list, the supplier shall select any one of the particular make from the approved list after mutual discussions with the Purchaser.

INSPECTION

1. For equipments/accessories/items, the suppliers shall invite Purchaser for inspection and preliminary testing. Inspection may be required at various stages of installation/assembling for some items. The Purchaser will arrange to complete such inspection as maybe necessary along with clearance within a reasonable time from the date of intimation by the supplier.

5. **SITE WORK AND INSTALLATION**

Protection of electronic equipment.

It is the responsibility of the bidder to ensure that all electronic equipment an control system shall be fully protected against hostile environment, humidity, heat and dust that will be encountered during storage and installation.

Temporary power supplies.

Power supply at site is normally very stable, but the bidder is responsible to ensure that delicate electronic equipment used during construction, such as welding machine, testing devices etc. are protected against damage from mains supply. In the event of a major power failure in the system, it shall be the responsibility of the bidder to hire a diesel generator if this proves to be
necessary.

COMMISSIONING

1. After satisfactory erection and testing, a competent team shall be deputed to commission the plant and to run operation trials and to establish performance parameters. However the commissioning of the complete plant will be done at an

appropriate stage which shall be informed to the successful bidder. Bidder to participate in the entire plant commissioning activity and ensure that his equipment is working as per the specifications and in the harmony with other equipment and design philosophy.

4. TRIAL AND PERFORMANCE GUARANTEE

On completion of the Commissioning period, the plant will be operated at full capacity to the satisfaction of the Project Authority for a period of seven days on the designed product.

Performance Guarantee**:** Performance and services consumption guarantees, and the relevant penalties for not meeting the rated capacities and efficiencies ar covered in the tender.

5. TRAINING

1.The objective of the training is to provide selected staff members of the dairy with necessary knowledge of operation and maintenance to ensure a sound and suitable operations of the plant Emphasis will be given on application as well as operation and not on basics.

Electrical staff
Training on PCC and MCC
Training on control and power wiring diagram Fault finding and maintenance

6. **SERVICE COVER**

The representative of the supplier shall attend the project for two days each month throughout performance period following first operation trials. These visits will cover meetings, training, equipment adjustment and servicing. These visits will not cover guarantee work, which will be undertaken separately.
The objective of service covers are intended to ensure that the efficiency of the plant is maintained at the optimum level and:
To help improve operating and maintenance procedures.

To keep the plant adjusted for optimum energy efficiency, product quality and minimum product losses.

To arrange for service visits by specialists to inspect, service and carry Out reports. 4.Spare parts during the services cover shall be supplied by the Purchaser.

Sub –Section-7 Deviations from Technical Requirement

This tender document provides guidelines for the processes and equipment to be used in tender package and the "basis of design" and the "standards and specifications", define the qualitative parameters against which equipment will be required to perform.

It is incumbent on bidder to provide a fully detailed list of equipment and services, which they intend to provide a fully execute the contract inline with the tender document.

At various points in the tender the purchaser has stated that alternative processes or alternative equipment will be considered. The bidder as part of the bid document shall provide the fully detailed list of such alternatives, together with a consider rationale for employing such alternatives.

Items, which deviate from the tender proposal, shall be as per design specification of the bidder and shall be treated as a deviation from the text of this tender document. Deviated item should fulfill the minimum performance parameters as specified in the tender.

This tender does not allow bidders to make exclusions from any part of tender packages for which they bid, and an incomplete list of equipment or an incomplete schedule of services to be provided would be considered as a non-responsive bid.

Technical Deviation Statement Form			
Sr. No	Clause Reference	Deviation	Remarks (Justification)

Above are the particulars of deviations from the requirements of the tender specifications. The technical specifications furnished in the bidding document shall prevail over those of any other document forming a part of our bid, except only to the extent of deviations furnished in this statement.

Date
Signature of Authorised Signatory of Bidder/Supplier

NOTE: Where there is no deviation, the statement should be returned duly signed with an endorsement indicating- No deviation

Sub - Section 8

DRAWING, DATA
&
DOCUMENTATION SUBMISSION

DRAWING AND DOCUMENTS FROM BIDDER

The Bidder must enclose the following Drawings with the Offer:
. Proposed layout for which is relevant. .
. Utilities flow diagram including utility equipment, interconnection piping, controls, instruments, automation etc. Single line diagram for electrical distribution system.
. The bidder should follow the guideline for preparation of drawing as described in general. Any deviation in thickness of material of construction and general arrangement will be specifically mentioned in the drawing as remark.
Automation Layout

PERFORMANCE TESTS

The bidder is required to detail the documentation proposed for performance tests of all major items of equipment and all major processes and services plant. This shall detail the guaranteed vs. actual throughput or output or performance (as relevant) and the tolerance of accuracy. Also the test methods proposed to demonstrate that these guarantees have been met.

FORMATS OF GUARANTEES:

. Guarantees for throughput of various sections of plant supplied.
. Product quality.
. Weight and Measurement tolerance.
. Service consumption.
. Formats for performance tests. Procedure for carrying out the .
. Method of measurement
.Test duration
. Evaluation methodology

UTILITIES CONSUMPTION

The following tables are to be completed by the bidder and returned with
bidding documents. This is mandatory and failure to comply may make the bid deemed non-responsive.

Utilities Consumption Data		
Power	Peak Load kW Total Load kWh/day Tolerance ± %	
Air	Peak Load Nm3/hr AvergeLoad:Nm3/Hr Total Load Nm3/day Tolerance ± %	

Water	Liters/ day	
Any other		

DETAILS OF CONSUMABLE MATERIALS

Bidder is to provide full details of all consumable materials and chemical used in the plant.

Details of Consumable Materials		
Item		

Sub-Section-9 **Criteria For Technical Evaluation of Bid.**

TECHNICAL EVALUATION OF BIDS

The purchaser will evaluate and compare the technical merits of the bids based on the information supplied by the bidders taking in to account the following factors:

Suitability of the process with regards to ultimate product quality conforming to the standards specified in the tender.

Specifications of individual equipment as well as the system as a whole for material of construction, throughput, operating parameters, level of automation etc.

Energy efficiency of individual equipment and system as a whole.

Space requirement.

Cost of spare parts.

Preference shall be given on better and advance technology.

Utility and raw material consumptions provided by the bidder.

Sub-Section-10

Process Performance and Consumption Guarantees

PROCESS PERFORMANCE & CONSUMPTION GUARANTEE If the plant or any part thereof does not give the agreed process performance and consumption guarantees during the warrantee period due to reasons attributable to the supplier, the supplier shall, subject to following:

EQUIPMENT PERFORMANCE
The satisfactory performance of the equipment/processing plant will be considered achieved if the plant operates above 98% of the rated capacity declared by supplier in the offer.
If the performance is between 95-98% of the rated capacity, penalty will be calculated at 2 % of the rupee value of the contract, per 1% of shortfall and part thereof.
If the performance is below 95%, the contractor will be required to upgrade the plant or replace the plant to comply with the above performance criteria. Otherwise the plant will be deemed unacceptable.

SERVICES REQUIREMENT

If measure demand of services in the plant is less than 102% of the consumption declared by the contractor, the buyer will accept that the service requirement guarantee has been achieved.

If the requirement of any of the services in the plant is between 102% and 105% of the declared demand, penalty will be charged at 2% of every 1% rise and part thereof in consumption for each of the services which falls in the category of excessive demand.

For the purpose of this calculation, only the main services, water, steam, power and chilled water will be considered.

If the measured demand for services and energy is above 105%, the contractor will be required to up-grade the plant or replace the plant to comply with the declared performance criteria. Otherwise, the plant will be deemed un-acceptable.

The penalty shall be levied for shortfall in performance of individual sections. However, if the shortfall in performance of any section affects the performance of the other sections, then penalty shall be levied for the entire contract value of all the affected sections.

MAXIMUM LIABILITY

The maximum liability of suppliers on all counts of penalties including above, Liquidated Damages clause and other liabilities of any kind shall not exceed 10% of Contract value.

PERTICULARS OF UNIT/ORGANISATION

I/We hereby furnish following particulars about our unit :

1. Name of the Unit :……

2. Address of the Unit :……..

3. Name & Address of the :……..

Directors/Partners :……

Name with Designation of other persons :……..

authorized to sign the documents on behalf:……..

of the Unit if anyway :……

Telephone /Fax No. …… Office…… Factory……..
Telegraphic Address …….. Office…… Factory ……
Particulars of the Registration certificate issued by the Directorate of Industries
…… Registration No. & Date……..
GST No. & Date ……State…… ST No. &Date 9. GST and income tax Assessment /Clearance has been made for the year last two years…… (Enclose Return/Assessment/Clearance certificate) 10.
Whether the unit or its sister concern unit or any unit of their proprietorship ,if any, has been Black listed/Debarred or Penalized by any central or state Govt./Organization at any Time YES ……NO……..
If "YES", when and Why? Give Reasons in Detail :

11.Manufacturing Facility :……..
12. Specification of the Plant :……
:…… (Please fill the Technical specifications in
Customers on current list : (separate sheet may be attached)
:……..

If you Propose to Diversify to Technological advancement if so, What is the expected time …… Name & address of service canters/engineers
No. of EQUIPMENTs supplied to coop. milk unions in last 5 years (separate sheet may be attached)
……
…. Annual turnover of the firm from EQUIPMENT segment (attach proof) …… Whether the EQUIPMENTs are being manufactured in India ……..
EMD details : DD No. ……Date : .....

Amount Rs. …….

Name of bank.....

I/We undertake that the information furnished in this tender document is correct to the best of my/our Knowledge and belief .

Date :

Place :

Signature of authorized Signatory of the Unit (with seal)

CONTRACT AGREEMENT FORM

(Refer clause of General Terms and Conditions)

(On a Non-Judicial Stamp Paper of Rs.500.00 or as per amended cost of stamp paper)

THIS AGREEMENT is made at ……..on the____ day of _____22 between Chief Executive Officer, …….. Sahakari Dugdha Sangh Maryadit, ……..,MP, India (hereinafter called "……..") of the one part and _____(hereinafter called "the Contractor") of the other part.
WHEREAS …….. has appointed Supplier/Contractor to get work done under the contract of the bid which has been submitted by Supplier/ Contractor and who has accepted a bid in response to the UDS' Bidding Document Reference____with regards to undertaking of the Mechanical &
Electrical work, for a sum of Rs.
(here in after called "the Contract Price").

NOW THIS AGREEMENT WITNESSTH AS FOLLOWS:
In this agreement words and expressions shall have the same meaning as in the Terms and Conditions and in respective Sections in the above referred Bidding Document.
The following documents shall be deemed to form and be read and construed as part of this Agreement, viz the offer and price schedule submitted by the Contractor:

b. the scope of work/ supply of items and the technical specifications in respective section of the above referred Bidding Document:

The General terms and conditions, special conditions of erection and commissioning in respective Sections in the above referred Bidding Document:
d. The ……. Work Order No.__ dated_____ (File ref.:)
In consideration of the payments to be made by the …….. to the Contractor, the Contractor hereby covenants with the……. to undertake
the……
……
…….. and to remedy defects therein in conformity in all respects with the provisions of the Work Order given by the Consultant and Bidding Document.

WITNESS whereof the parties hereto have caused this agreement to be executed in accordance with their respective laws the day…….. and year…….. first above written.

Signed, Sealed and Delivered by Signed, Sealed and Delivered by the said

Authorized Signatory Authorized Signatory
Chief Executive Officer,
…….
Contractor Sahakari Dugdha Sangh Maryadit,
……..,MP, India

In the presence of: In the presence of:
Witness Witness

Signature
1) Signature

Name
Address Address

2) Signature

Name
Address

(Form of Bank Guarantee for Performance Security)

Refer clause of General Terms and Conditions)

(On the Non-judicial Stamp paper as per the Stamp Act of Local State Govt.)

Bank Guarantee No……Date:……..

This deed of performance guarantee made this__day of 20 (Two Thousand ____) by_____(Name and address of the Bank) (herein referred to as the Bank) which expression shall unless repugnant to the context and meaning thereof includes its legal representatives, successors and assignees and the _ **Chief Executive Officer, …….. Sahakari Dugdha Sangh Maryadit, ……,MP, India** _(hereinafter referred to as "……..") which expression shall unless repugnant to the context and meaning thereof include its legal representative, successors and assignees.

Whereas, UDS has awarded a Contract and Purchase order bearing No._____ dated _____ on M/s._____(Name and address of the party) (hereinafter referred to as the `Supplier') for the …… ……..And whereas, the Supplier has agreed to submit a performance guarantee in the form of a Bank guarantee to the …… as per terms and conditions of the Bidding Documents and the Contract which will be kept valid up to___ calendar months from the date of Bank Guarantee (the period should be till end of warranty period).

In consideration to the above where in…….. has awarded the contract/purchase order to the Supplier, we _____ (name of the Bank), do hereby guarantee, undertake, promise and agree to with the Service Recipient, its legal representatives, successors and assignees that the within named_____(name of the Supplier) their legal representatives and assignees will faithfully perform and fulfill everything within the Bidding Document and the Contract/Purchase order on their part to be performed or fulfilled, at the time (time being the essence of the contract)and in the manner therein provided, do all obligations there under and we further undertake and guarantee to make payment to the …… of Rs._____ (Rupees only) being the 10% of the contract value, without any demur in case the Supplier, their legal representatives and assignees do not faithfully perform and fulfill everything within the Bidding Document and the Contract/Purchase order on their part to be performed or fulfilled,
at the time and in the manner therein provided and do not willfully and promptly do all obligations there under.
In case, the Supplier fails to perform or fulfill the Contract/ Purchase Order as per the terms and conditions agreed upon, the ……. is entitled to demand an amount equal to Rs. _____ being the 10% of the contract value from the Supplier and the demand made by the …… itself will be conclusive evidence and proof that the Supplier has failed to perform or fulfill his obligations and neither the Supplier nor the Bank continuous and irrevocable guarantee up to a sum of Rs. _____ (Rupees_____only).

Notwithstanding anything stated hereinbefore: (i) our liability under this guarantee is restricted to Rs _____(ii) the guarantee shall remain in force till_____20__ and

(iii) The Bank
is liable to pay the guarantee amount or any part thereof under this bank guarantee only if the ……. serves upon the Bank a written claim or demand on or before_____.

_____

(SIGNATURE)
Place: SEAL Date:
CODE NO
NOTE:
1 THE SUPPLIER SHOULD ENSURE THAT SEAL AND CODE NO. OF THE SIGNATORY IS PUT BY THE BANKERS, BEFORE SUBMISSION OF THE BANK GUARANTEES.
STAMP PAPER IS NOT REQUIRED IN CASE OF FOREIGN SUPPLIERS. THE VALUE OF STAMP DUTY SHOULD BE AS PER THE LATEST STAMP ACT OF LOCAL STATE GOVERNMENT FROM WHERE THE BANK GUARANTEE ISSUED.

Form of Bank Guarantee for advance

(On the Non-judicial Stamp paper as per the Stamp Act of Local State Govt.)

Bank Guarantee No. Date:

1. In consideration of Chief Executive Officer, ……..Sahakari Dugdha Sangh Maryadit,……..,MP, India (hereinafter called '……..') having agreed to grant an advance of Rs._____ (Rupees _____ only) to M/s. _____ (here in after called the said supplier) under the terms and conditions of an contract/purchase orderNo._____dated _____ made by ……. to M/s._____..... ....**..... Sah.Dugdha Sangh** (hereinafter called the `said contract/purchase order') on production of a Bank Guarantee for Rs._____ (Rupees_____) only.

1. We_____ (here in after called `the Bank') do hereby undertake to pay the ……. an amount not exceeding Rs._____ (Rupees _____ only) against any loss/damage caused to or suffered would be caused or suffered by the ……. by reason of any breach by the said supplier(s) of any of the terms and conditions contained in the said contract/ purchase order.

2. 2. We, _____(the name of Bank) , do hereby undertake to pay the amounts due and payable under this guarantee without any demur merely on a demand from the …….. which has to be served on us before the expiry date of Bank Guarantee i.e., _____ stating that the amount claimed is due by way of loss or damage caused to our would be caused to or suffered by the ……. by reasons of any breach by the said supplier(s) of any of the terms and conditions contained in the contract/purchase order or by reasons of the supplier(s) failure to perform the said contract/purchase order, any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee shall be restricted to an amount not exceeding Rs._____

3. (Rupees _____) only.

4. 3. We, _____(the name of 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 contract/purchase order and that it shall continue tobe enforceable till all the dues of the ……., under, or by virtue of the said contract / purchase order have been fully paid and it's claims satisfied or discharged or till Service Recipient certifies that the terms and conditions of the said contract/ Purchase Order have been fully and properly carried out by the said supplier(s) and accordingly discharge the guarantee unless a demand or claim under this guarantee made on us in writing on or before _____ , we shall be discharged from all liability under this guarantee thereafter.

5. 4. We, _____(the name of Bank), further agree with the USDS that the Service Recipient shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said contract / purchase order to extend time of performance by the said Supplier from time to time or to postpone for any time or from time to time any of the power exercisable by the ……. against the said supplier and to forbear or enforce any of the terms and conditions relating to the said contract/Purchase Order and we shall not be relieved from our liability by reason of any such variation, or extension or for any forbearance, act of omission on the part of the…….. or any indulgence by the ……. to the said Supplier 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. 5 The Bank agrees that the amount hereby guaranteed shall be due and payable to the ……. on serving us with a notice before expiry of Bank Guarantee requiring the payment of the amount and such notice shall be deemed to have been served on the Bank either by actual delivery thereof to the Bank or by dispatch there of to the Bank by registered post at the address of the Bank.

7. 6. We, _____(the name of Bank), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the……. in writing.

8. 7. We, _____(the name of Bank), undertake to renew the Bank Guarantee provided the request for renewal is made by the said supplier before

the expiry of Bank Guarantee.

9.8. Not withstanding anything stated hereinbefore (i) our liability under this Bank Guarantee is restricted to Rs._____(Rupees _____ only) (ii) The guarantee shall remain in force till the _____ 20___ and (iii) The Bank is liable to pay the guarantee amount or any part thereof under this bank guarantee only if the ……serves upon the Bank a written claim or demand on or before_____.

10. Place:_____

11. Date :

12. (SIGNATURE)

13. SEAL

14. CODE NO.

15. NOTES:

1. SUPPLIERS SHOULD ENSURE THAT SEAL AND CODE NO. OF THESIGNATORY IS PUT BY THE BANKERS, BEFORE SUBMISSION OF THE BANK GUARANTEES.

2. STAMP PAPER IS NOT REQUIRED IN CASE OF FOREIGN SUPPLIERS.

3. THE VALUE OF THE STAMP DUTY SHOULD BE AS PER LATEST STAMP ACTOF LOCAL STATE GOVERNMENT FROM WHERE THE BANKGUARANTEE ISSUED.

SCOPE OF SUPPLY/BOQ/PRICE BID **(Includes design, engineering, supply, labour job for construction, fabrication, installation, testing, commissioning, trial run, training, IBR approval and AMC. work)**					**Qty.**	**Unit**
(01). Design, engineering and supply						
A. Oil/ gas(dual) fired Boiler of 4000 kgs per hour steam generation capacity complete with all equipment and accessories: (mechanical)					**One**	**Lot for "A"** **(S. no. 01 to 12 components/ accessories of Boiler)**
S.NO.	**NAME OF EQUIPMENT/ ACCESSORIES**	**PERTICULARS**	**QTY.**	**UNIT**		
01	**PRESSURE PART ASSEMBLY**	consisting of the Full fusion welded shell, wet back furnace and two sets of convection smoke tubes, hinged ceramic lined front doors and smoke chamber with soot cleaning door. One Manhole, Two head holes on the boiler shell to inspect the internal of the boiler. One access opening at the back of the IRC to inspect the internal of the furnace. Two fusible plugs are provided as an ultimate mechanical safety to prevent the boiler from over heating in case of very extra low water level in boiler.	01	Lot		
02.	**OIL CUM GAS FIRED BURNER**	Pressure jet spill return step less modulation burner with the high voltage spark ignition/Pilot flame for burner light up. Burner should be suitable for firing LDO/ Natural gas(Both for low and high pressure) one at a time. Pressure gauge at inlet & outlet with isolation valve & syphon for oil pressure sensing. Flame sensor is provided in the burner to detect the flame in auto mode operation.	01	Lot		

03	**FUEL OIL PUMPING UNIT**	Fuel oil gear pump with motor. With Isolating ball valves at inlet and outlet	02	Set		
04	**AIR /OIL/GAS REGULATING ASSEMBLY**	Damper assembly with step motor & cam linkages with oil regulating valve to control oil flow rate to the burner. Separate cam for gas .Proper support frame to be provided to mount the Air regulating assembly.	01	Lot		
05	**FORCED DRAFT COMBUSTION AIR FAN**	Backward curved design Forced draft combustion air fan with the motor & flexible duct at the suction & discharge of the fan to prevent the other components from any vibration. Arrangement to be provided to connect the Air regulating assembly at the suction of the fan.	01	Lot		
06	**FEED WATER PUMPS**	Highly efficient Centrifugal multi-stage, vertical feed water pumps with motor, Impellers & shaft of the pump should be of stainless steel with Mechanical Seal.	02	Set		
07	**CONTROL PANEL BOX ASSEMBLY**	**Panel box :** **A - Power cum control panel:** **The power & control section should be physically isolated with partition plate. The power section to be provided with a main incomer Isolating switch with MCCB. The required switch gears for all the feeders to be housed in the power section. Burner management system along with necessary start stop button, auxiliary contactor, control circuit, indication lamps & hooter for**	01	Lot		

		the alarm are housed in the control section. **- Temp indicator & switch is provided in the control panel to indicate the boiler stack temp to give high stack temp alarm , lamp indication & burner trip interlock.** **- One Sequence controller for burner management system to be provided.** **B- FIELD MOUNTED INSTRUMENTS:** **Should have as follows:** **Pressure switch for stepless modulation. - 01** **Pressure switch for burner ON/OFF control. - 01** **Temperature element for flue gas temperature- 01** **Pressure switch to sense low combustion air pressure-01**				
08	**ACCESSORIES**	**Air ducting:** **Set of M.S ducting to connect the burner to F.D.Fan. -01** **Piping:** **Set of Natural gas piping from gas train to burner inlet.-01** **Set of feed piping to connect feed water pumps to the boiler.-01**	01	Lot		
09	**SET OF VALVE MOUNTINGS AND FITTINGS**	**.** **BOILER SHOULD HAVE FOLLOWING :** **Main steam stop valve.-01** **Spring loaded single port safety valves.-02** **Air vent valve. -01** **Blow down valve.-01** **Main steam pressure gauge.-01** **Explosion door for protection against high flue gas pressure.-01** **plain tubular gauge glasses along with inbuilt isolation and drain valves.- 02** **Float operated magnetic water level**				

<table>
<tr><td></td><td></td><td>controller,-02
Isolation valves for Main steam pressure gauge , Inspector pr
gauge & Isolation valve and drain valve for two float operated
level controller. -08

<u>Structure</u>
Boiler should have Set of ladder & catwalk to operate the valves & fittings mounted.
01 Set</td><td></td><td></td><td></td><td></td></tr>
<tr><td>10</td><td>FUEL OIL FILTER</td><td>Duplex type basket filter with suitable filter element.</td><td>01`</td><td>Set</td><td></td><td></td></tr>
<tr><td>11</td><td>GAS TRAIN SUITABLE FOR OPERATION OF HIGH OR LOW PRESSURE GAS</td><td>Consisting of:
Isolating ball valve on main line.-01
Gas filter-01
Pressure gauge each at upstream &down stream of the pressure regulator with push to read valves.-02
Gas pressure regulator.-01
Safety shutoff valve -01
Relief valve with isolation ball valve -01
Low gas pressure switch -01
Solenoid Valves-02
Solenoid valve on pilot line-01</td><td></td><td></td><td></td><td></td></tr>
<tr><td>12.</td><td>BOILER SAFETIES</td><td>Should be provided as follows:
<table>
<tr><td>Safety features/ Unsafe conditions</td><td>Instrument</td><td>Action</td></tr>
<tr><td>(a) Low water level in the boiler #</td><td>Level controller-1</td><td>Alarm & burner trip</td></tr>
<tr><td>(b) Extra low water level in the</td><td>Level controller -2</td><td>Alarm & burner</td></tr>
</table></td><td></td><td></td><td></td><td></td></tr>
</table>

		boiler		**trip**			
		(c) Very extra low level	**Fusible plug**	**Fusible plug blow & burner trip**			
		(d) Flame failure	**Flame sensor**	**Alarm & burner trip**			
		(e) Steam pressure high	**Safety valve**	**Lift**			
		(f) Stack temp high	**Temperature switch**	**Alarm & burner trip**			
		(g) Gas pressure low	**Pressure switch**	**Alarm & burner trip**			
		(h) combustion air pressure low	**Pressure switch**	**Alarm & burner trip**			
		Note – **1. For avoiding the dry run of the boiler feed water pump , it has to be provided with the potential free contact of the extra low level switch of the soft water tank , to be hooked up in the boiler control panel.** **02. Suitable provision is to be made in the Boiler control panel to trip the main fuel pump in case of ring main pump pressure is low to avoid burner inlet pressure**					

		fluctuations				
B. Other Items/accessories:					**Qty**	**Unit**
01		**Day MS tank with epoxy painted for water (10KL).** No.			01	Lot (01 to 11 under B)
02		**Furnace oil storage tank-10 kl.**	01	No.		
03		**Day tank of suitable capacity for FO- it will be insulated and provided with steam heating and condensate out.**	01	No.		
04		**Air Pre Heater suitable for Boiler.**	01	Set		
05		**Chimney 30.5 Mtr of height suitable for above Boiler (As per IBR norms) with all other accessories for complete installation including round ladder up to required height for drawing samples of out going hot gases.**	01	Lot		
06		**Interconnecting Duct between Boiler to APH to Chimney.**	01	Lot		
07		**Soft water storage tank (MS) of 10 KL Capacity.**	01	Lot		
08		**All water, drain, vent and blow down piping.**	01	Lot		
09		**New steam pipeline up to the processing, Ghee, Butter, RMRD and any other existing working sections where ever required in main dairy plant**	01	Lot		
10		**Insulation materials for Boiler & Pipelines up to main plant.**	01	Lot		
11		**Suitable Pressure Reducing Station for existing processing/ production sections in main dairy plant.**	01	Set		
C.	**De-Mineralized water treatment plant**					
01		**Suitable capacity De-Mineralized water treatment plant for above Boiler.**	01	No.	01	No
D	**ELECTRICAL WORK:**				01	Lot of A & B of D
	A.	**Electrical materials for power cabling from existing PCC to MCC and motors of Boiler.**	01	Lot		

	B.	**Electrical materials for complete illumination of Boiler shed.**	01	Lot		
(02). All CIVIL CONSTRUCTION MATERIAL, STEEL AND MILD STEEL FOR BOILER HOUSE						
01	Civil and fabrication materials.	**Civil construction materials and Mild Steel for construction of Complete Boiler house with civil foundations for Boiler & Chimney and Steel/ Mild Steel for civil structure of shed, Plate forms , Ladder & Catwalk as per design requirement of Boiler, equipment/ accessories, space for operation and piping offered by the bidder..**	01	Lot	01	Lot

03	**LABOUR JOB FOR CONSTRUCTION, INSTALLATION, TESTING, COMMISSIONING, SUCCESSFUL TRIAL RUN AND TRAINING OF 4000 KGS PER HOUR CAPACITY GAS/ OIL (DUAL) FIRED BOILER.**		**Qty.**
01	**MECHANICAL JOB**	**Complete installation, testing, commissioning, trial run, training to USDS staff of 4000 kgs per hour capacity Boiler along with it's equipment and accessories as mentioned in the design, engineering and supply under A,B,C.(scope of supply)**	**01 Job**
02	**CIVIL CONSTRUCTION AND FABRICATION JOB**	**Civil construction work for Complete Boiler house with civil foundations for Boiler & Chimney and Mild Steel fabrication work for shed, Plate forms , Ladder & Catwalk as per design requirement of Boiler, equipment/ accessories, space for operation and piping offered by the bidder..**	**01 Job**