TENDER DOCUMENT

TENDER DOCUMENT FOR DESIGN, SUPPLY AND LABOUR JOB FOR INSTALLATION, TESTING AND COMMISSIONING OF EQUIPMENT FOR CONVERSION OF EXISTING MANUAL SYSTEM IN TO AUTOMATIC OPERATION OF WEIGHING, CONVEYING AND BATCH MIXING OF RAW INGREDIENTS FOR CATTLE FEED MANUFACTURING PLANT OF 50 TPD CAPACITY AT BANDOL (SEONI) UNDER JABALPUR SAHAKARI DUGDHA SANGH MARYADIT, JABALPUR, MADHYA PRADESH.

SUDANA

पशु आहार संयंत्र-बण्डोल, जिला-सिवनी-480882 (म.प्र.)
CATTLE FEED FACTORY, BANDOL, SEONI -480882 (M.P.)
Factory -Phone : (07692)- 237511
E-mail : cff.Bandol@gmail.com
Unit of : JABALPUR SAHAKARI DUGDHA SANGH MARYADIT JABALPUR .
PAN- AAAAJ0485D GST- 23AAAAJ0485D1Z6 TIN -23875801833

No:853/PROJECT/JSDSM/ CFF/BANDOL /2019 **Date. 06 -03-2019**

INVITATION FOR BIDS (IFB)

Jabalpur Sahakari Dughdh Sangh Maryadit Jabalpur invites on-line tenders from Manufacturers /Authorised Suppliers having adequate experience in DESIGN, SUPPLY AND LABOUR JOB FOR INSTALLATION, TESTING AND COMMISSIONING OF EQUIPMENT FOR CONVERSION OF EXISTING MANUAL SYSTEM IN TO AUTOMATIC OPERATION OF WEIGHING, CONVEYING AND BATCH MIXING OF RAW INGREDIENTS FOR CATTLE FEED MANUFACTURING PLANT OF 50 TPD CAPACITY AT BANDOL (SEONI) UNDER JABALPUR SAHAKARI DUGDHA SANGH MARYADIT, JABALPUR, MADHYA . Tender document is available & can be downloaded from the website https://mptenders.gov.in up to 3:00 PM 0n 04/04/2019. A pre-bid meeting at CFF Bandol, District- Seoni, is also fixed on 22/03/2019 at 1.00 PM hence bidders may attend for their quiries.

The tender document is also available on the web site www.mpcdf.gov.in of M.P. State Co-Operative Dairy Federation to read the terms & conditions, scope of works etc. as a reference only. The C.E.O., J.S.D.S. reserves the right to accept or reject any or all the tenders without assigning any reasons.

CHIEF EXECUTIVE OFFICER

Jabalpur Sahakari Dugdh Sangh Maryadit

GENERAL INFORMATIONS

1. NAME OF WORK:	**DESIGN, SUPPLY AND LABOUR JOB FOR INSTALLATION, TESTING AND COMMISSIONING OF EQUIPMENT FOR CONVERSION OF EXISTING MANUAL SYSTEM IN TO AUTOMATIC OPERATION OF WEIGHING, CONVEYING AND BATCH MIXING OF RAW INGREDIENTS FOR CATTLE FEED MANUFACTURING PLANT OF 50 TPD CAPACITY AT BANDOL (SEONI) UNDER JABALPUR SAHAKARI DUGDHA SANGH MARYADIT, JABALPUR, MADHY**.
2. PERIOD OF completion of project for complete work. (Supply, installation, commissioning and successful trial)	**Award of work shall be given to successful bidder after completion of agreement and necessary formalities for the work as per tender to enable bidder to seek approval of plant- layout, to start fabrication, procurement of plant, machineries, equipment to deliver at the site and keep ready for installation at the stage of progressive civil building construction work. The bidder shall complete installation, commissioning and successful trial run within 06 months (Six months) from the date of such stage and the same shall be notified to bidder separately for considering the effective date for completion period of 06) months (Six months.**
3. CONTACT PERSON	Mr. A K Ngam, I/C General Manager, CFF, Bandol, district Seoni under JDS . **Cell. No.9131876687**
4. Last date & time for Tender Document purchase online	**04/04/2019 up to 3:00 pm**
5. Last date and time for on-line submission of Bid .	**04/04/2019 UPTO 3:00 P.M**
6**.Last date & time for.physically submission of EM.D. and technical bid in separate envalops**.	**04/04/2019 UPTO 2:30 P.M**
7.Date and time of on-line opening of Envelop of E.M.D.	**05/04/2019 AT 3:00 P.M**.
8.Date and time of on-line opening of Envelop (B) of Technical Bid	**05/04/2019 AT 3:00 P.M**.
09.Date and time of opening of physically submitted E.M.D and technical bid	**05/04/2019 AT 3:30 P.M**.

10.Date and time of opening of on line price bid.	**Subject to technical bid eligibility of required minimum offers.**
11. Place of opening of physically submitted Envelop of EMD.	**Meeting Hall Of Admin.Block of J.S.D.S**
12. Prebid meeting	**22/03/2019 at Cattle Feed Plant Bandol (Seoni)**
12.Cost of Tender Document	**Rs. 1000/-**
13. Earnest Money Deposit (E.M.D.)	**Rs.2,00,000/-**
14.Address for Communicaation	**CATTLE FEED FACTORY BANDOL (A UNIT OD JABALPUR SAHAKARI DUGDH SANGH MARYADIT), NEAR MILK CHILLING CENTRE, OLD NH-7 ROAD , BANDOL DISTRICT- SEONI (MADHYA PRADESH)**
15.Name of the Employer/owner	**JABALPUR SAHAKARI DUGDH SANGH MARYADIT** DAIRY PLANT . KARONDANALA, IMALIYA, JABALPUR

Section I Part –I General Conditions of Contract

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INSTRUCTIONS TO BIDDERS

1. **Tenders are invited for**:

DESIGN, SUPPLY AND LABOUR JOB FOR INSTALLATION, TESTING AND COMMISSIONING OF EQUIPMENT FOR CONVERSION IN TO AUTOMATIC WEIGHING, CONVEYING AND BATCH MIXING OF RAW INGREDIENTS OF EXISTING CATTLE FEED MANUFACTURING PLANT OF 50 TPD CAPACITY AT BANDOL (SEONI) UNDER JABALPUR SAHAKARI DUGDHA SANGH MARYADIT, JABALPUR, MADHYA PRADES.

2. A. The Tenderers are requested to go through the tender document's instructions andvarious terms and conditions contained in sections as mentioned in Table of content. It may be noted that no conditions or stipulations to the contrary or which are inconsistent b will be accepted. tenderers are requested to ensure that all such schedules along with questioner (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.

B. As mentioned in IFB, there will be a **prebid meeting at CFF, Bandole(Seoni)** to clearify any quaries/doubts about the scope of supply/work and methodology of execution.

Bidders are requested to send thier quaries two days prior to the date of Prebid meeting through mail on following Email- cff.bandole@gmail.com in order to keep replies/ clearifications ready.

As a result of above, if the JDS authority feels for any changes/ammendment are required in the bid the same shall be done and shall also be notified as corrigendum on the tender website.

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

4. The tender document are to be uploaded in two parts as explained below:-

(a) Envelop-A : This part is fulfilling the requirement of deposit towards Earnest Money and Technical Bid (Form-A) along with duly filled questionnaire (Both EMD and Technical bid documents should be sealed in separate envelop subscribing as "**EMD FOR AUTOMATION OF BATCH MIXING SYSTEM OF EXISTING CATTLE FEED PLANT OF 50 TPD CAPACITY, BANDOL (JDS)**, under Jabalpur sahakari dugdha Sangh Maryadit, Jabalpur" and "Technical Bid document for **AUTOMATION OF BATCH MIXING SYSTEM OF EXISTING CATTLE FEED PLANT OF 50 TPD**

CAPACITY, BANDOL (JDS), under Jabalpur sahakari dugdha Sangh Maryadit, Jabalpur" and should be further sealed in Envelop-A for physical submission). The supplier in this envelope should put scan copy of acknowledgemenet of online paymant of in support of having paid towards EarnestMoney for the purpose and Technical Bid as per tender document (duly filled) and documents supporting the same on or before tender opening date as per schedule of submission mentioned in IFB.

Scaned copies of above documents are to be uploaded online on the website https://mptenders.gov.in and photo copies of Technical bid documents are to be submitted physically in Envelop-A .

(b) Envelop-B : - For this part shall contain duly filled Price Bid (Form-B) as per the price bid format and to be uploaded on line on website https://mptenders.gov.in **only.** Pl. note that price bid format is to be uploaded online only and not to be submitted physically or else bid will be rejected without opening technical bid.

5. METHOD OF SUBMISSION OF TENDERS AND THEIR OPENING:

(a) Main envelope containing the Envelop-A shall be super scribed as under:-

(i) "TENDER Reference NO"

(ii) "IT IS CERTIFIED THAT I/WE CATEGORICALLY AGREE TO ALL THE TERMS & CONDITIONS OF THIS TENDER ":-

Signature of authorized Signatory of the Unit(with seal)

2. BASIC QUALIFICATIONS OF TENDERER.

1. The bidder should be a authorised dealer or manufacturer of of Cattle Feed Plant- machineries and its accessories.

2.The bidder should have previous experience in having supplied equipment of same capacity or above, and its related accessories as per the technical specifications given in the respective section in India either to any cooperative institution or Private organisations/NDDB/IDMC project., for which tender called for, and enclose copies of purchase order/ supply order.

3.The performance report for the supply, installation and commissioning from the reputed purchaser shall be enclosed in the technical bid part –AI. The performance certificate received from purchaser / client should be of within a period of 3 years, ie.for the year 15-16, 16-17 1nd 17-18. A copy of the purchase order for which the performance certificate is furnished should be submitted.

4.The Bidder should have minimum experience of minimum 5 Years, ie from the year 2013 to till now and he should be in the business of manufacturing / supply of Cattle Feed Plant equipment and accessories in the same name for which the document have been produced.

Copies of Registration of firms with list of activities/GST registration certificate etc. should be enclosed as supportingdocument.

-If the bidder is an authorized dealer / suppliers of a manufacturer, the bidder shall furnish the authorization letter from the manufacturer for supply of equipment & its related accessories as per the technical specifications given in the respective section.

If the bidder is an authorized dealer / suppliers for equipment and its related accessories then the experience of the manufacturer for supply of equipment, and its related accessories and their performance shall be taken for evaluation of technical bids, even if the supply has been made either by the manufacturer directly or through other agencies.

The bidder should have necessary infrastructural facilities such as capacity, man-power, solvency, suitability and eligibility for Supply, erection and commissioning of similiar equipment and its related accessories (OR) In case if the bidder is a supplier then furnish authorization certificate from the manufacturers and their infrastructure facility details as mentioned above.

The bidder should possess required certificate from the competent authority for pressure vessel, copy of the same to be submitted if required.

The bidder should possess required certificate for Electrical installation and commissioning from the competent authority and the copy of the same to be submitted.

2. EARNEST MONEY: The supplier shall deposit the Earnest Money amount (EMD) as mentioned in Bid invitation and General informations, payable online during uploading of tender at https://mptenders.gov.in only. EMD will not be accepted in cash at Finance section JSDS or in the form of Demand Draft . Bidder shall up load scan copy of the transection no./ receipt obtained through online paymant as proof of successfull paymant.

In case, the supplier withdraws his offer during the validity period, after placement of order, the EMD amount shall be forfeited..

RETURN OF EARNEST MONEY TO TENDERER

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 tenderer. No interest shall be paid on EMD amounts.

3. TAXES AND DUTIES

a) 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.

b) NA.

4. AMENDMENT IN SPECIFICATIONS

The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT, JABALPUR-.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 communicated to all those who have bought the tender documents online and also uploaded on our web site https://mptenders.gov.in

5. DELAYED/ LATE SUBMISSION OF TENDERS

The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR-. shall not assume any responsibility for any postal delays either for the late receipt of documents .

supplier or late receipt of tenders by the Board/JSDS. No Extension in time shall be granted on such grounds.

6. ALTERNATIVE TENDERS

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

7. 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 JABALPUR SAHAKARI DUGDH SANGHA MARYADIT, JABALPUR shall be considered. Such offers can also be rejected on recommendation of committee.

8. Documents to be submitted with the Tender (Mandatory)

a) Copy of Registration Certificate of the Firm / Organization (Tenderer).
b) Copies of purchase orders last five year .
c) Copy to latest Income Tax returns & copy of Permanent Account Number (PAN) and GST
d) Clint list

e) Completion/Performance certificates
f) Income Tax/Sales Tax return of last three(3) years

9. ALTERATIONS/CORRECTIONS IN TENDERS

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

10. INCOMPLETE TENDERS

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

11. ACCEPTANCE OF PART/WHOLE TENDERS & NEGOTIATION OVER TENDERERS RIGHTS THEREOF

(A) Chief Executive Officer, Jabalpur Sahakari Dugdha Sangh Mydt, has the Power to negotiate with lowest tenderer on the tender date Or any suitable date decided thereof.

(B) JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR-.reserves the right to accept / reject wholly or partly any tender without assigning any reasons whatsoever.

The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR in this regard shall not entertain any correspondence.

12. AMBIGUITIES IN CONDITIONS OF TENDERS

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

13. DIS-QUALIFICATION OF TENDERS

Tender which gets opened before the due date as a result of improper or no indication having been given on the cover to indicate that it is a tender, will be disqualified.

Tenderer will not be permitted to change the substance of his tender on postinterpretation/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.

14. 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.

15. SUBMISSION OF TENDERS

The tender shall be submitted in two(2) parts:- Part-I shall contain "EARNEST MONEY DEPOSIT"&" TECHNICAL BID". Marked as Envelop-A Part-II shall contain "PRICE BID",in the Price Schedule. The supplier shall ensure that the prices/rates are filled in accordance with the Proforma for "Price and Quantity." Marked as Envelop-B.

16. It may please be noted that the due date/ time of opening can be altered, extended,if felt necessary by the purchaser, without assigning any reason thereof However, due intimation shall be communicated in such a case.

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

Mandatory documents to be submitted as per S.No.8 above shall be part ofTechnical Bid. The concerned tender committee of JSDS shall first open the Part —I envelope - A of all the Tenderer and verify the Earnest Money Deposit and aligibility of 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 other envelope-B 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 in respect of eligible Tenderer as per the schedule.

18. 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 and EMD will be forefitted.

19. 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.

20. ACCEPTANCE OF TENDER

i) The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR-. may reject any or all tenders or to accept any tender considering advantageous to JABALPURSAHAKARI DUGDHSANGHA MARYADIT,JABALPUR.

ii) The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT, JABALPUR-. may split the quantities against the tender on more than one supplier for the same item. The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR shall assign no reasons for this and the same will be binding on the Tenderer.

21. PAYMENT TERMS:-

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

A- FOR DESIGN AND SUPPLY OF PLANT AND EQUIPMENT

a) 50% against the safe receipt of material at site after verification by Project Manager/JDS official and on production of valid invoice, delivery challan/ any other document.
Maximum processing time for payment shall be one month from the date of submission of document and request.

b) 25 % after installation, Commissioning and successful trial run of supplied equipment.

c) 25% after submission of **performance security document** (in the form of DD/Banker's Cheque/ Bank guarantee **as per the format attached at Sub section of this document)** of 10% of total project cost with validity not less than one year from date of commissioning . The performance security will be discharged by the Purchaser and returned to the Supplier not later than 30 days following the date of completion of the Supplier's performance obligations, including any warranty obligations, under the Contract and if found for liable of any recoveries towards performance of obligation, the action shall be initiated with the concerned bank for recovering against performance BG.

B- Payment for labour charges for installation, testing and commissioning:

(a) 90% of the contract price for labour charges of installation, testing and commissioning shall be paid on actual completion of installation/erection and after due inspection and approval by the purchaser/JDS (against detailed break up cost to be furnished by the Supplier as per tender price bid in advance and accepted by the Purchaser).

(b) On final acceptance:The balance 10% shall be paid on continuous satisfactory running of the complete plant for one month, on completion of other contracted services and accepted by the purchaser's representative, within the scope of this contract and submission of performance bank gaurantee.

C. BANK GAURANTEE AGAINST SECURITY FOR THE PROJECT PERIOD:

The bidder shall provide security deposit for the amount equal to the 10% of the project cost (as approved bid price) in the form of DD/ Bank gaurantee towords Protction of above paymant system as mentioned in clause no.21 along with conteract agreement.This will be valid for the completion period project till commissioning and training and shall be discharged on submission of Performance BG.

22. PRICES AND STATUTORY LEVIES

(i) The tenderer should quote price F.O.R. destination including Erection, Installation&Commissioning and trial run charges on turnkey basis. However, break up of following elements may be indicated separately :-

(a) Unit Ex-works/Ex-go down rate including packing and forwarding.

(b) GST/ any other Duty applicable on Ex-works price as on date of Tender.

(c) Tax :GST

(d) Freight charges

(e) Any other levy/taxes.

(f) In case of exemption from excise duty/or sales tax, documentary evidence shall be furnished with the offer.

(h) No revision on any account shall be allowed during execution of the order.

(ii) Prices offered by the tenderer should be firm and free from all escalations. Theprices offered should be valid at least for a period of 90 days from the date of tender opening.

(iii) The Material to be supplied shall be dispatched to site by Road transport underintimation 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 JSDS on written request from supplier.

(iv) After rate approval, the party shall have to execute an agreement on a non—judicial stamp paper worth Rs. 1000/- to be executed with Jabalpur Sahakari Dugdh Sangha Maryadit , Jabalpur within 15 days from the issue of work order.

23. TRANSIT RISK

(a) Responsibility regarding covering of risks during transit of material shall entirely be on the supplier. The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR-. shall, in any case, not bear the transit risks/ transit insurance charges.

(b) Insurance shall be arranged by the supplier.

24. 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.

25. DELIVERY: Supply, Erection,Installation & Commissioning shall be commenced within 3 months (including rainy season) from the date of receipt and acceptance of confirmation of order or from the date of contract agreement whichever is favourable to JDS. 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,Jabalpur Sahakari Dugdh Sangha Maryadit,Jabalpur.

26. FORCE MAJEURE

Force majeure condition is herein defined as:-

(a) Natural phenomena, such as floods, draughts, earth-quakes and epidemics.

(b) Act of any Government Authority, domestic or foreign, such as war, quarantines, embargoes, licensing control or production or distribution restrictions.

(c) 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.

(d) Strikes slow down, lockouts continuing for more than three (3) weeks.

(e) Failure or delay in the supplier's source of supply due to force majeure causesenumerated at (a) to (d) above, provided the supplier produces

documentaryevidence 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.

(f) 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.

27. 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 JABALPUR SAHAKARI DUGDH SANGHA MARYADIT, JABALPUR

28. PERFORMANCE GUARANTEE AND SECURITY

28.1 **performance security document** (in the form of DD/Banker's Cheque/ Bank guarantee **as per the format attached at Sub section of this document)** of 10% of total project cost with validity not less than one year from date of commissioning . The performance security will be discharged by the Purchaser and returned to the Supplier not later than 30 days following the date of completion of the Supplier's performance obligations, including any warranty obligations, under the Contract and if found for liable of any recoveries towards performance of obligation, the action shall be initiated with the concerned bank for recovering against performance BG.

28.2 If during the course of 18 months subsequent to the date of receipt of consignment and also during the 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 or else shall be recoverable from performance B.G.,etc.

28.3 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 like-wise 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 or within the period intimated by the Purchaser. The guarantee period as stipulated in clause 32.1 above shall also be applicable for repaired/replaced material, which shall however be counted a fresh from the date of its delivery in our stores/site.

28.4 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.

28.5 Actual cost of dismantling and replacement of these' equipments/ materials withthe new ones may be charged to the supplier's account.

28.6 To and fro transportation cost of such failed equipment may also be borne by the supplier/ bidder.

28.7 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 JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR..

29. 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.

30. EXTENSION ORDER

The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT, JABALPUR-.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.

31. RECOVERIES FOR LIABILITIES AGAINST OTHER CONTRACTS

All amount recoverable from the successful Tenderer against earlier contractsincluding orders on sister concern with the JABALPUR SAHAKARI DUGDH

SANGHA MARYADIT,JABALPUR-.will be adjusted from payment due against the contract that may be awarded under this specifications.

32. 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.

33. CANCELLATION OF ORDER

33.1 The JABALPUR SAHAKARI DUGDH SANGHA MARYADIT, JABALPUR-. May upon written notice of default, terminate contract in the circumstances detailed hereunder:-

a) If in the opinion of the JABALPUR SAHAKARI DUGDH SANGHAMARYADIT,JABALPUR, the supplier fails to deliver the material within the time specified or during the period for which extension has been granted by the JSDS.

b) If in the opinion of the JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR, 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.

c) As a result of stage inspection, if applicable, it is revealed that material and/ or, workmanship is substandard which is likely toaffect the performance of the finished product, a notice would be served' by the JABALPUR SAHAKARI DUGDH SANGHAMARYADIT,JABALPUR-. to the supplier to suspend further activities and to take urgent steps towards corrective measures, failing which the entire order would be cancelled.

33.2 In the event of such termination, JABALPUR SAHAKARI DUGDH SANGH MARYADIT,JABALPUR 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 JABALPUR SAHAKARI DUGDH SANGHA MARYADIT, JABALPUR-.'s right to recover damages.

33.3 Not withstanding that the powers under clause (a, b & c) referred to above, are inaddition to the rights and remedy available to the JABALPUR SAHAKARI DUGDHSANGHA MARYADIT,JABALPUR under the general law of India relating to Contract.

33.4 In the event of risk purchase of stores of similar description, the opinion of theJABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR shall be final. In the event of action taken under clause 33.2(a) to (c) above,the supplier shall be liable to pay for any loss, which the JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR-. may sustain on that account but the supplier shall not be entitled to any saving on such purchases made against the default.

33.5 NA .

33.6 In the event, JABALPUR SAHAKARI DUGDH SANGH MARYADIT,JABALPUR-. 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 JABALPUR SAHAKARI DUGDH SANGHA MARYADIT,JABALPUR-.

34. 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 Jabalpur Sahakari Dugdh Sangha Maryadit ,Jabalpur 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 supplierduring the arbitration proceedings, unless otherwise, directed in writing by thePurchaser or unless the matter is such that the work cannot possibly be continued until the decision of the arbitrators or of the Umpire, as the case may be, is issued.

35. 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 Jabalpur only.

36. RANDOM TESTING-

Inspection of material after receipt or waiver of inspection will not relieve thesupplier from his responsibility to supply the material strictly in accordance with the specification. The JABALPUR SAHAKARI DUGDH SANGH MARYADIT,JABALPUR 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.

37. CORRESPONDANCE:-

Copies of all important correspondence on subject should be sent to "I/C, General Manager, CFF, Bandole, District Seoni.

38. CONSEQUENCES OF BREACH OF AGREEMENT

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

39.0 DISPUTE ARBITRATION & FINAL AUTHORITY

39.1 It should be clearly understood that in the event of any dispute between supplierand purchaser due to deviation from any terms and conditions of work order &contract agreement, the decision of the Chairman, Jabalpur Sahakari Dugdha Sangh Mydt., in this respect will be final and binding on the both supplier and purchaser.

39.2 For matters of dispute, relating to the interpretation of the above clause, thedecision of the Chief Executive Officer, Jabalpur Sah. Dugdha Sangh Mydt, shall be final and binding on all the concerned.

40. 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, with out prejudice to its other

remedies under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to:

i) Upto 15days 1% of the contracted value.

ii) Between 16 to 30 days 2% of the contracted value

iii) Beyond 30 days 5 % of the contracted value JSDS 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-1

SPECIAL CONDITIONS OF CONTRACT FOR GENERAL ERECTION & COMMISSIONING PART – II

CONTENTS

1.0 SUFFICIENCY OF TENDER

TheSupplier by bidding shall be deemed to have satisfiedhimself as to all the conditionsand circumstances affecting the Contract Price, as to the possibilityof executing the works as shownand describedinthe Contract, astothegeneral circumstances at the site of the works, as to the general labour position at site and to have determined the prices accordingly.

2.0 PROGRAMME OF INSTALLATION AND COMMISSIONING

As soon as practicable after the acceptance of the bid, the Supplier shall submit to the Purchaser for his approval a comprehensive programme in the form of PERT network/ bar chart and any other form as may be required by the Purchaser showing the sequence of order in which the 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 programme, the supplier shall adhere to the sequence of order and method stated therein. Thesubmission to and approval bythe Purchaser of such programmeshall not relieve the Supplier of any of his duties or responsibilities under the Contract. The programme approved by the Purchaser shall form the basis of evaluating the pace of all works to beperformed by the supplier. The 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.

3.0 PREPARATION OF DRAWINGS FOR APPROVAL

The Supplier should visit the site to acquaint himself in respect of existing site conditions and to know the details/informationrequired for understandingthe nature and type of civil construction works involved in the project. The Supplier shall submit to the Purchaser for approval:

a. Within the time given in the specification or in the programme, suchdrawings, samples, patterns and models as may be called for therein, and in numbers therein required.

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

Wherever necessary, the Supplier would be provided with a set of architectural drawings for the buildings where the erection works would be carried out.The specifications/ conditions concerning the submission of drawings by the Supplier are detailed as under

3.1 Within four weeks from the date of receipt of the Notification of Award, Supplier shallfurnish a list of all necessary drawings as briefly described below whichthe Supplier shallsubmitforapproval, identifying each drawingsby a serial number anddescriptive title and expected date of submission. This listshall 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 programme.

If, by reason of any failure or inability of the purchaser to issue within four weeks of time in all the circumstances any drawing or order requested by the supplier in accordance with sub clause (3) of this clause, the Supplier suffers delay then the Purchaser shall take such delay into account in determining any extension of time to which the Supplier is entitled under Clause 15 hereof.

Brief list of drawings:

I. Equipment drawings for fabricated items.
II. Equipment layout for production, packing and service blocks.
III. Flow diagrams for milk/CIP and various services.
IV. Service piping layouts in production, packing and service blocks.
V. SS piping layout in production and packing blocks.
VI. Electrical cable, conduit/cable tray/cable trench layout.
VII. Other miscellaneous drawings as required for erection work.
VIII. Electrical single line diagram, PCC and MCC general arrangement drawing and wiringdiagrams.
IX. Automation system scheme, controls and network diagrams.

3.2 Drawings showing fabrication details, dimensions, layouts and bill of materials submitted for approval shall be signed by responsible representative of Supplier and shall be to any one of the following sizes in accordance with Indian Standards:A0,A1, A2, A3 and A4.

3.3 All drawings shall show the following particulars in the lower right hand corner inaddition to Supplier's name:
i.Name of the Purchaser. ii.Project Title.
iii.Title of drawing. iv. Scale.
v.Date of drawing. vi. Drawing number.
vii.Space for OTHER reference or drawing number.

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

3.5 All dimensions on drawings shall be in metric units.

3.6 Drawings (three sets) submitted by the Supplier for approval will be checked, reviewedby the Purchaser, and comments, if any, on the same will be conveyed to the Supplier. It is the responsibility of the Supplier to incorporate correctly all the comments conveyed by the Purchaser on the 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 all the comments have been incorporated by the Supplier.

If the Supplieris unable to incorporate any comments in the revised drawings, Supplier shall clearly state in his forwarding letter such non-compliance along with the valid reasons.

3.7 Drawings prepared by the Supplier and approved by the Purchaser shall be consideredas a part ofthe specifications.However, the examination ofthe drawings by the Purchaser shall not relieve the Supplier of his responsibilityforengineering design,workmanship, quality of materials, warranty obligations and satisfactory performance on installation covered under the contract.

3.8 If at any time before completion of the work, changes are made necessitating revisionof approved drawings, the Supplier shall make such revisions and proceed in the same routine as for the original approval.

3.9 Date of submission - In the event, the drawings submitted for approval require many revisions amounting to re-drawing of the same then the date of submission of the revised drawings would be considered as the date of submission for approval.

3.10 The Supplier shall furnish to the Purchaser before the worksare taken over, Operatingand 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 to be completed for the purposes of taking over until such instructions and drawings have been supplied to the Purchaser.

4.0 SUPPLIER'S SUPERINTENDENCE (AND) DEPLOYMENT OF ERECTION TEAMAND CONDUCT OF PERSONNEL

TheSupplier shall employ one or more competent representatives, whose name or names shall have previously been communicated inwriting to the Purchaser by the Supplier, to superintend the carrying out of the works on the site. The said representative or if more than one shall be employed, the none of such representatives shall be present on the site during all times,and any orders or instructions which the Purchaser may give to the said representative of the Supplier shall be deemed to have given to the Supplier. The said representative shall have fulltechnical capabilities and complete administrative and financial powers to expeditiously and efficiently execute the work under the contract.

4.1 The Supplier shall, execute the works with due care and diligence within the time forcompletion and employ 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 Supplier shall ensure adequate workforce to keep the required pace at all times as per the

schedule of completion. Supplier shall also ensure availability of competent engineers during commissioning/start up, trial runs, Operation of the plant/equipmenttill handing over of the plant.

4.2 TheSuppliershallfurnishthedetails of qualificationsandexperienceoftheir senior supervisors and engineers assigned to the worksite, including theirexperience in supervising erection and commissioning of plant and equipment of comparable capacity.

4.3 When the Supplier or Supplier's representative is not present on any part of the workwhere 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 to have been given to the Supplier.

4.4 The Supplier shall furnish to the Purchasera fortnightly labour force reportshowing by classifications the number of employees engaged in the work. TheSupplier's employment records shall include any reasonable information as may be required by the Purchaser. The Supplier should also display necessary information as may be required by statutory regulations.

4.5 None of theSupplier's supervisors, engineers, or laborers may be withdrawn from thework 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.

4.6 The Purchaser shall be at liberty to object to any representativeor person, skilled,semi-skilledor unskilled worker employed by the Supplier inthe execution of or otherwise about the works who shall, in the opinion of the Purchaser, misconduct himself or be incompetent, or negligent or unsuitable, andthe 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 Supplier's own expense within a reasonable time.

4.7 In the execution of the works no persons other than the Supplier, sub-Supplier and theiremployees shall be allowed on the site except by the written permission of the Purchaser.

5.0 PURCHASER'S INSTRUCTIONS

The Purchaser may in his absolute discretion, issue from time to time drawings and/orinstructions, directions and clarifications which are collectively referred to asPurchaser's instructions in regard to:

5.1 Any additional drawing and clarifications to exhibit or illustrate details.

5.2 Variations or modifications of the design, quality or quantityof work or the additions oromissions or substitution of any work.

5.3 Any discrepancy in the drawings or between the schedule of quantities and/orspecifications.

5.4 Removal from the site of any material brought there by the Supplier, which areunacceptable to the Purchaser and the substitution of any other material thereof.

5.5 Removal and/or re-execution of any work erected by the Supplier, which areunacceptable to the Purchaser.

5.6 Dismissal from the work of any persons employed there upon who shall in theopinion of thePurchaser, misconduct himself, or be incompetent or negligent.

5.7 Opening up for inspection of any work covered up.

5.8 Amending and making good of any defects.

6.0 RIGHT OF THE PURCHASER

6.1 Right to direct works:

6.1.1 The Purchaser shall have the right to direct the manner in which all works under thisContract shallbe 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.

6.1.2 Whenever in the opinion of the Purchaser, the Supplier has made marked departuresfrom 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 Supplier.

6.1.3 If in the judgment of the Purchaser, it becomes necessary at any time to accelerate theoverall pace of the plant erection work, the Supplier, when directed by Purchaser, shall cease work at any particular point and transfer 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.

6.2 Right to order modifications of methods and equipmentIf at any time the Supplier's methods, materials or equipment appear to the Purchaser to beunsafe, 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 Supplier toensure safety, andincreasetheir efficiencyand adequacy and the Supplier shall promptly comply with such directives. If at any time the Supplier's working force and equipment are inadequate in theopinion of the Purchaser, forsecuring the necessary progress as stipulated, the 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 Supplier of Supplier's obligations to secure the quality, the safe conducting of the work and the rate of progress required by the contract. The Supplier alone shall be and remain liable and responsible for the safety, efficiency and adequacy of Supplier's methods, materials,workingforceand equipment, irrespective of whether or not the Supplier makes any changes as a result of any order or orders received from the Purchaser.

6.3 Right to inspect the work.

6.3.1 The Purchaser's representative shall be given full assistancein the form of thenecessarytools, instruments, equipment and qualified operatorsto facilitateinspection.

6.3.2 The Purchaserreserves the right to call for the original test certificates for all thematerials used in the erection work.

6.3.3 In the event the Purchaser's inspection reveals poor quality of work/materials, thePurchaser shall be at liberty to specify additional inspection procedures if required, to ascertain Supplier's compliance with the specifications of erection work.

6.3.4 Even though inspection is carried out by the Purchaser or Purchaser's representatives, such inspection shall not, however, relieve the 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.

7.0 SUPPLIER'S FUNCTIONS

7.1 The 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 Supplier finds any discrepancy therein, Supplier shall immediately refer the same to the Purchaser whose decision shall be final and binding on the Supplier.

7.2 The Supplier shall proceed with the work to be performed under this Contract in thebest 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.

7.3 VARIATIONS

7.3.1.1 The Purchaser shall make any variation of the form, quality

Or quantity of the Works or any 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 Supplier to do and the Supplier shall do any of the following:

a. Increase or decrease the quantity of any work included in the contract,
b. Omit any such work,
c. Changethe character or quality or kind ofany such work,
d. Change the levels, lines, position and dimensions of any part of the works, and
e. Execute additional work of any kind necessary for the completion of the works and nosuch 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.

7.3.1.2 No such variations shall be made by the Supplier 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 further that if the Supplier shall withinseven days confirm in writing to the Purchaser and such confirmation shall not be contradicted in writing by the Purchaser within 14 days, it shall be deemed to be an order in writing by the Purchaser.

7.3.2.1 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.Ifthe 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 Supplier, with consideration of Overhead & Profit limiting to 15%. In the event of disagreement the Purchaser shall fix such rates or prices as shall, in his opinion, be reasonable and proper.

7.3.2.2 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 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 under sub-clause 7.3.2.1 of this clause or variation of rate or price under sub-clause 7.3.2.2 of this clause 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

a. By the Supplier to the Purchaser of his intention to claim extra payment or a varied rateor price,

Or

b. By the Purchaser to the Supplier of his intention to vary a rate or price.

7.3.2.3 If, on certified completion of the whole of the works, it shallbe found that a reduction or increase greater than 15per cent of the sum named in the Letter of Acceptance results from the aggregate effect of all Variation Ordersbut not from any other cause, the amount of the Contract Price shall be adjusted by such sum as may be agreed

between the Supplier and the Purchaser or, failing agreement, fixed by the Purchaser having regard to all material and relevant factors, including the Supplier's site and general overhead costs of the contract.

7.3.2.4 The Suppliershallsendtothe Purchaser'srepresentative once in every monthan account giving particulars, as full and detailed as possible, of all claims for any additional payment to which the Supplier may consider himself entitled and of all extra oradditional 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 Supplier's failure to comply with this condition, if the

Supplier has, at the earliest practicable opportunity, notified the Purchaser in writing that heintends to make a claim for such work.

7.4 The work shall be carried out as approved by the Purchaser or his authorizedrepresentative/s from time to time, keeping in view the overall schedule of completion of the project. The Supplier's job schedule must not disturb or interferewith Purchaser's or other Suppliers' or Contractors' schedules of day-to-day work. The Purchaser will provide all reasonable assistance for carrying out the jobs.

7.5 Night work will be permitted only with prior approval of the Purchaser. The Purchasermay also direct the 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 bythe Supplier at no extra cost. The Supplier should\ employ qualified electricians and wiremen for these facilities. In case of 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 Supplier.

7.6 The Supplier shall, in the joint names of the Supplierand the Purchaser, insure thereceived goods and equipment and so faras reasonably practicable the Works and keep each part thereof insured for the Contract Sum or such other value as may be mutually agreed between the Purchaser and the Supplier against all loss or damage from whatever cause arising, other than the excepted risks, from the date of shipment or the date on which it becomes the property of the Purchaser, whichever is the earlier,until it is taken over by the Purchaser. The Supplier shall insure against the Supplier's liability in respect of any loss or damage occurring whilst the Supplier is on Site for the purpose of making good a defect or carrying out the Tests on Completion.

7.7 The Purchaser shall not be liable for or in respect of any damages or compensationpayable at law in respect or in consequence of any accident or injury to any workman or other person in the employment of the Supplier or any sub-Supplier, save and except an accident or injury resulting from any act or default of the Purchaser, his agents, or servants. The 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.

7.8 The Supplier shall insure against such liability with an insurer approved by thePurchaser, 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-supplier, the Supplier's obligations to ensure as aforesaid under this sub-clause shall be satisfied if the sub-supplier shall have insured against the liabilityin respect of such persons in such manner that the Purchaser is indemnified under the policy, but the Suppliershall require such sub-supplierto produceto thePurchaserorPurchaser's representative, when required, such policy of insurance and the receipt for the payment of the current premium.

7.9 Whenever proper execution of the work under the Contract depends on the jobs carriedout by some other supplier, in such cases the Supplier should inspect all such erection and installation jobs and report to the Purchaser regarding any defects or discrepancies. The Supplier's failure to do so shall constitute as acceptance of the other supplier's installation/jobs as fit and proper for reception of Supplier's works except those defects which may develop after execution. Supplier should also report any discrepancy between the executed work and the drawings.

The Supplier shall extend all necessary help/co-operation to other suppliers working at the site in the interest of the work.

7.10 The Supplier shall keep a check on deliveries of the Goods covered in the scope oferection work and shall advise the Purchaser well in advance regarding possible hold-up in Supplier's work due to the likely delay in delivery of such Goods to enable him to take remedial actions.

7.11 The Supplier shall be permitted to substitute equipment of equal on better performancesubject to approval by the Purchaser; which approval shall not be unreasonably withheld, provided however that the Supplier establishes to the Purchaser's satisfaction thattheperformanceofthe substituted equipment is equal or better than the performance of the equipment specified in the contract and without any increase in the Contract price.

8.0 DUTIES OF THE PURCHASER VIS-A-VIS THE SUPPLIER:

8.1 The Goods, if any, to be supplied by the Purchaser for erection, testing andcommissioning by the Supplier, shall be as listed in the Contract.

8.2 Besides the utilities/services as specified in battery limits the following assistance/facilities shall also be provided to the Supplier by the Purchaser for carrying out the installation work.

8.2.1 Plant building in production block and for services including internal lighting will be made available by the Purchaser, the power consumed shall be chargable.

8.2.2 Supplier shall carry-out final adjustments of foundations, leveling and dressing offoundation surfaces, bedding and grouting of anchor bolts, bed plates etc. required for seating of equipment in proper position. The Supplier shall be responsible for the reference lines and proper alignment of the equipment. However, all minor civil works which form and inseparable part of the installation and erection job like digging trenches for laying of cables, conduits and underground pipes, making cut-outs in walls, floors and ceilings for pipelines, adjustment, leveling, dressing and grouting of foundations, grouting of supports are to be carried out by the Supplier at no extra cost. The necessary refilling/ repairs of these cutouts, pockets and trenches shall be done by the Supplier. The Supplier should arrange for laying the supports, cutouts, grouting of bolts, etc. when the civil works are in progress, so as to avoid refilling/repair works. The damages occurring to civil and other works are to be made good by the Supplier at Supplier's own costs.

8.2.3 Necessary temporary water for carrying out the installation shall be supplied atonly one point within the project site by the Purchaser.All necessary distribution tappings from this point onwards shall be the Supplier's responsibility.

8.2.4 Necessarytemporarypower for carryingoutthe installation shall be arranged bythe bidder.

8.3 The details of temporary water and power requirements shall be furnished one month inadvance by the Supplier to enable the Purchaser to make timely arrangement.

8.4 If the Supplier suffers delay and/or incurs costs from failure on the part of the Purchaserto give possession of the civil works in accordance with the mutually agreed schedule, the Purchaser shall determine:

a. Any extension of time to which the Supplier is entitled under Clause 22 of GCC and;

b. The amount of such costs, which shall be added to the Contract Price, and shall notifythe Supplier accordingly.

9.0 SUPPLY OF TOOLS, TACKLES AND MATERIALS

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

10.0 PROTECTION OF PLANT

10.1 The Purchaser shall not be responsible or held liable for any damage to person orproperty consequent upon the use, misuse or failure of any erection tools and equipment used by the Supplier or any of Supplier's sub-supplierseven though such tools and equipment may be furnished, rented or loaned to the Supplier or any of Supplier's sub-suppliers. The acceptance and/or use of any such tools and equipment by the Supplieror Supplier's sub-supplier shall be construed to mean that the Supplier accepts all responsibility for and agrees to indemnify and save the Purchaser from any and all claims for said damages resulting from the said use, misuse or failure of such tools and equipment.

10.2 The Supplier and Supplier's sub-supplier shall be responsible, during the works, forprotection of work, which has been completed by other

Suppliers.Necessary care must be taken to see that the Supplier's men cause no damage to the same during the course of execution of the work.

10.3 All other works completed or in progress as well as machinery and equipment that areliable to be damaged by the Supplier's work shall be protected by the Supplier and protection shall remain and be maintained until its removal is directed by the Purchaser.

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

10.5 The work shall be carried out by the Supplier without damage to any work and propertyadjacent to the area of Supplier's work to whomsoever it may belong and without interference with the operation of existing machines or equipment.

10.6 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 Supplier at Supplier's cost. The Supplier should adequately light the work area during nighttime also. The Supplier should also engage adequate electricians/wiremen. Helper etc. to carry out and maintain these lighting facilities. If the Supplier fails in this regard, the Purchaser may provide lighting facilities as he may deem necessary and charge the cost thereof to the Supplier.

10.7 The Supplier shall take full responsibility for the care of the works or any section orportions thereof 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 whatsoever, the same shall be made good by and at the sole cost of the Supplier and to the satisfaction of the Purchaser. The Suppliershall also be liable for any loss of or damage to the works occasioned by the Supplier or the Supplier's Sub-Supplier in the course of any operations carried out by the Supplier or by the Supplier's Sub-Suppliers for the purpose of completing any outstanding work or complying with the Supplier's obligations.

11.0 UNLOADING, TRANSPORTATION AND INSPECTION

11.1 The Supplier shall be required to unload all the Goods from the carriers, received at siteafter Supplier's team arrives at site. The Supplier shall plan in advance, based the information received from the Purchaser, Supplier's requirement of various tools, tackles, jacks, cranes, sleepers etc. required to unload the material/equipment promptlyand efficiently. The Supplier shall ensure that adequate and all measures necessary to avoid any damage whatsoever tothe 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 Supplier's account. The Supplier shall be responsible for receipt at site of all Goods and Supplier's equipment delivered for the purposes of the Contract.

11.2 The Supplier shall safely transport/shift the unloaded Goods and equipment to thestorage area.

11.3 All the Goods received by the Purchaser prior to arrival of the Supplier at site shall behanded over to the Supplierand there upon the Supplier shall inspect the same and furnish a receipt to the Purchaser. The manner in which the inspection shall be carried out is enumerated below:

11.3.1 The materials/equipment would be carefully unpacked by opening the woodencases/other modes of packing as the case may be.

11.3.2 Detailed inventory of various items would be prepared clearly listing out the shortages,breakages/damages after checking the contents with respect to the supplier's packing list, the Purchaser's Contract and approved equipment drawings. The Supplier shall also check every equipment for any shortage/shortcoming that may eventually create difficulty at the timeof installation or commissioning.

11.3.3 All the information and observations by the Supplier shall be furnished in the form of INSPECTION REPORT' to the Purchaser with specific mention / suggestions which in the opinion of the 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.

11.3.4 The inspection for all the Goods handed over to the Supplier shall be completed withinthree week's period.

11.4 The protection, safety and security of the Goods so taken over from the Purchaser shallbe the responsibility of the Supplier, until they are handed over to the Purchaser after erection, commissioning and testing as per the terms of the Contract.

12.0 STORAGE OF GOODS

The Supplier shall be responsible for the proper storage and maintenance of all Goods under Supplier's custody. 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.

12.1 The Supplier's inspector shall check stored and installed Goods 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 Supplier shall immediately arrange a coat of protective painting whenever required. A record of all observations made on Goods, defects noticed shall be promptly communicated to the Purchaser and purchaser's advice taken regarding the repairs/rectifications. The Supplier shall thereupon carry out such repairs/ rectifications at Supplier's own cost. In case the Supplier is not competent to carry out such repairs/ rectifications, thePurchaser reserves the right to have this done by other competent agencies at the Supplier's responsibility and risk and the entire cost for the same shall be recovered from the Supplier's bills.

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

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

12.4 If the commissioning of Goods is delayed after installation of the Goods, the Suppliershall carry out all protective measures suggested by the Purchaser during such period.

12.5 Adequate security measures shall be taken by the Supplier to prevent theft and loss ofGoods handed over to the Supplier by the Purchaser. The Supplier shall carry out periodical inventory checks of the Goods received, stored and installed by the Supplier and any loss noticed shall be immediately reported to the purchaser. A proper record of these inventories shall be maintained by the Supplier. The Supplier should not sell, assign, mortgage, hypothecate or remove Goods which have been installed or which may be necessary for completion of the work without the written consent of the Purchaser.

12.6 A suitable grease recommended for protection of surfaces against rusting (refined frompetroleum oil with lanclin minimum (70 deg C) and water in traces) shall be applied over all Goods as required once in every six months.

12.7 All Goods 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 megger readings shall be maintained equipment wise. Such records shall be presented to the Purchaser whenever demanded.

12.8 All the necessary Goods required for protection as described above shall be arrangedby the Supplier and such cost shall be included in the Contract Price.

13.0 APPROVALS

13.1 The Supplier shall obtain the necessary approvals of the Factory Inspector, Boiler Inspector, 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. All the necessary details, drawings, submission of application and proformas will be furnished by the Supplier to the purchaser for verification/ signature. The necessary application duly filled-in, together with the prescribed fees shall be submitted to the appropriate authorities by the Supplier on behalf of the Purchaser. However all the actual statutory prescribed feespaid by the

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

13.2 Wherever necessary or required, the Supplier shall furnish the necessarytest and/or inspection certificates etc. from the appropriate authorities as per IER and other statutory regulations and the cost for obtaining these certificates shall be included in the Contract Price.

14.0 REVIEW AND CO-ORDINATION OF ERECTION WORK

The Supplier shall depute senior and competent personnel to attend the site co-ordination meetings that would generally be held at the site every month. The Supplier shall take necessary action to implement the decisions arrived at such meetings andshall also update the erection schedule.

15.0 EXTENSION OF TIME FOR COMPLETION

Should the amount of extra or additional work of any kind or any cause of delay referredto in these conditions, or exceptional or adverse climatic conditions, or other special circumstances of any kind whatsoever which may occur, as described in Clause 25 of the General Conditions of Contract, other than through a default of the Supplier, be such as fairly to entitle the 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 Supplier accordingly. Provided that the Purchaser is not bound to take into account any extra or additional work or other special circumstances unless the 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-1

SPECIAL CONDITIONS OF CONTRACT FOR MECHANICAL WORKS

PART – III

NOTE:- THIS SECTION CONTAINS STANDARD CONDITIONS APPLICABLE FOR COMMON MACHANICAL WORK FOR ALL TYPES OF FABRCATIONS AND CODE OF STANDARDS, BIDDER TO CONSIDER RELEVANT STANDARDS ONLY WHICH ARE APPLICABLE FOR THE SPECIFIC JOB OF THIS TENDER.

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1.0 MECHANICAL INSTALLATION

2.0 GENERAL INSTALLATION

2.1 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 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 asspecifiedin 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 plantand 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 shallfully rein-state and make good allthings disturbed during execution of the work, tothe satisfaction of the Owner. The Supplier shall be paid no additional amount for the above.

2.2 Structural Platforms, Service Pipe Bridge and Tables

Structural platforms shall be required to provide access for various equipments. Pipe support bridges/gantry shall be required for supporting the pipes from the ground, including road crossings outside the buildings.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 purchaser shall arrange for any civil works required for the above works based on the drawings and loaddetails provided by the bidder.Necessary templates and other accessories required by the civil contractor shall be provided by the bidder.

3.0 SERVICE PIPING INSTALLATION

3.1 General Guidelines

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

3.1.1 Regulations of explosives inspectorate.

3.1.2 All applicable Indian Standards.

3.1.3 Allapplicable State Government/CentralGovernment laws/acts.

3.1.4 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 competent authority for approval.

3.2 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, in the proforma given in Annexure I.

3.3 Scope of Piping Erection

This to be performed by the Supplier as outlined below:

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

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

3.3.3 The Supplier shall also install necessary pipings and any specialities furnished with or for equipment such as relief valves, built-in-pass and other items of this type.

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

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

3.3.6 The Supplier shall install all pipes, valves and specialities being procured fromother sources.

3.4 Testing of Piping

3.4.2 The Supplier shall test all piping systems mentioned below including valves andspecialities and instruments as per procedure mentioned under respective clause.

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

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

3.4.4 The testing pressures for various pipelines shall apply as per standard laid down.

3.5 Other Guidelines

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

3.5.2 The Supplier shall be responsible for the quality of welding done by them and shallconduct tests to determine the suit-ability of the welding procedure by him.

3.5.3 All piping supports, guides, anchors, hangers, rollers with structural frameworkshall be supplied and erected by the Supplier. Only anchor fastners of adequate size shall be provide for support from RCC structures and Hilmit Gun shall be used for fastening the anchors. The kinds 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.

3.5.4 All piping shall be suspended, guided and anchored with dueregard to generalrequirements 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.

3.5.5 Anchors and/or guides for pipelines or for other purposes shall be furnished, whenspecified, for holding the pipeline in position for alignment. Hangers shall bedesigned fabricated and assembled in such a manner that they cannot become disengaged by any movement of the support pipes.

3.5.6 All piping shall be wire brushed and purged with air blast to remove all rust, millscale from inner surface. The method of cleaning shall be such that no materialis left on the inner or on outer surfaces, which will affect the service-ability of the pipes.

3.5.7 Effective precautions such as capping and sealing shall be taken to protect all pipeends 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.

3.5.8 All pipes in the corridor shall be supported from the side wall or as applicable.

3.5.9 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:

Pipe size	Spacing between supports
Up to 12mm	1.5m
15 to 25mm	2.0m
30 to 150mm	2.0m
Over 150mm	2.5m

3.5.10 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 airvent at the highest point.

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

3.5.12 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.

3.5.13 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

3.5.14 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 forexpansion and contraction in pipes include expansion joints wherever required.

3.5.15 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.

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

3.5.17 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.

3.5.18Tee-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.

4.0 SPECIAL INSTRUCTIONS AND SPECIFICATIONS

5.0 NA

6.0 INTER CONNECTIONS OF SERVICE AND ELECTRICALS WITH EQUIPMENT

6.1 The Supplier shall lay service piping and provide connections with the equipmentcomplying 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.

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

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

7.0 GUIDELINES FOR EXPANSION WORK

7.1 Shutdowns

Plant shut down shall be required for making tappings/interconnections of the new equipment proposed to be installed under modifications 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.

7.2 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.

7.3 Change over

The programmes 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.

7.4 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.

8.0 CLEAN UP OF WORKS SITE

8.1 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.

8.2 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.

8.3 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 approvalof 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 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 Supplierand nothing extra would be paid for these.

10.0 TESTING, COMMISSIONING AND START-UP

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

10.2 The commissioning shall also include the following for each equipment:

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

10.2.2 Clean out of lubrication system including chemical cleaning wherever required.

10.2.3 Circulation of lubricant to check flow.

10.2.4 Clean out and check out of all the service lines.

10.2.5 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 must be carried out by approved authorities and their satisfactory reports submitted to the Owner before start-up.

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

10.2.7 Operation in empty condition to check general operation details wherever required and wherever possible.

10.2.8 Closed loop dynamic testing with water wherever required.

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

10.2.10 Trouble shooting during the trial period.

10.3 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.

All 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 Section VI.

10.4 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.

10.4 After satisfactory commissioning and start-up, the Supplier shall keep/depute hisrepresentatives at the plant in the manner, for the duration and for the performance of such tasks as specified in Section VI.

11.0 PAINTING

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 inthe scopeof 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 in Annexure - III must be adhered to.

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

12.0 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, commissioningandstart-up period and the training tenure shall be extended for a minimumperiod of six months from the dateof commissioning and start-up. This training will be a continuous process during commissioning and stand by period and as described in the Technical Specifications.

SECTION-1

SPECIAL CONDITIONS OF CONTRACT FOR ELECTRICAL INSTALLATIONS (GENERAL)

(PART-IV)

NOTE:- THIS SECTION CONTAINS STANDARD CONDITIONS APPLICABLE FOR COMMON MACHANICAL WORK FOR ALL TYPES OF FABRCATIONS AND CODE OF STANDARDS, BIDDER TO CONSIDER RELEVANT STANDARDS ONLY WHICH ARE APPLICABLE FOR THE SPECIFIC JOB OF THIS TENDER.

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SPECIAL CONDITIONS OF CONTRACT

ELECTRICAL INSTALLATION

1.0 SCOPE

The intent of this specification is to define the requirements for the installation, testing and commissioning of the electrical system like High Tension switchyard with accessories and equipment, Two/fourPole Structure, Transformers, HT Panels, Vacuum Circuit Breakers, DG Sets, LT MCC Panels, Power Control Centres, Distribution Boards, Capacitor Banks, APFC Panels, HT/LT Power, Control &Signal Cables, Remote Push Button Stations, Isolators, Electric Motors, Earth Pits, Earthing Network etc. Requirement of a particular project shall be as specified in Schedule of Quantities, approved drawings and the Battery Limits stipulated in the contract.

2.0 STANDARDS

2.1 The work shall be carried out in the best workmanlike manner inconformity with this specification, the relevant specification/codes of practice of the Bureau ofIndian Standards, approved drawings and the instructions issued by the Engineer-in-charge or his authorized representative, from time to time. Some of the relevant Indian Standards are listed at Clause 7.0 appearing in this section.

2.2 In addition to the standards as mentioned in 2.1, all works shall alsoconfirm to the requirements of the following:

a) Indian Electricity Act and Rules framed there under.
b) Fire Insurance Regulations.
c) Regulations laid down by the Chief Electrical Inspector of the State/State Electricity Board.
d) Regulations laid down by the Factory Inspector of the State.
e) Any other regulations laid down by the local authorities.
f) Installation & operating manuals of original manufacturers ofequipment.

3.0 EQUIPMENT AND ACCESSORIES - SPECIFICATIONS

This defines specifications and requirements mainly for the equipment and accessories which are generally supplied by the Supply/ Installation agency. All materials, fittings and appliances to be supplied by the 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 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.

Allsimilarmaterialsandremovablepartsshallbeuniformand interchangeable with one another. Makes of bought out items selected by the Supplier must be furnished by him before delivery at site.

3.1 Power Cables (HT)

Three core, Aluminium conductor, screened, XLPE insulated, armored shielded and PVC sheathed cables suitable for 11/22/33 KV, earthed system, conforming to IS 7098 (Part II) 1988 amendedupto date.

3.2 Power Cables (LT)

Powercables for use on 415 V system shall be of 1100 Volt grade, Aluminium conductor, XLPE insulated, PVC sheathed, armoured and overall PVC sheathed, strictly as per IS: 7098 (Part I) – 1988amended up to date. Conductor of cable shall be solid type for sizes up to 6 mm2 and stranded for sizes above 6 mm2.Unarmoured cables are to be used only if specifically mentioned in schedule of quantities. Also, copper conductor power cables may be used only if specifically mentioned in the schedule of quantities.

The size of these cables shall be as specified in schedule of quantities or as per approved drawings. If neither of these is available, the size of cable shall be as specified in cable selection chart mentioned at Clause 9.0 appearing later in this section.

NO POWER CABLE OF ALUMINIUM CONDUCTOR HAVING SIZE LESS THAN 4 MM^2 SHALL BE USED.LIKEWISE, NO POWER CABLE OF COPPER CONDUCTOR HAVING SIZE LESS THAN 2.5 MM^2 SHALL BE USED.

3.3 Control Cables

3.3.1 Control Cables for Power

Control cables for use on 415 V system shall be of 1100 Volts grade, Copper conductor, XLPE insulated, PVC sheathed, armoured and overall PVC sheathed, strictly as per IS:7098 (Part I) - 1988 amendedup to date. Conductor of cable shall be solid type for sizes up to 2.5 mm2 and stranded for higher sizes. Unarmoured cables are to be used only if

specifically mentioned in schedule of quantities. The size of these cables shall be as specified in schedule of quantities or as per erection drawing.

MINIMUM CONDUCTOR SIZE FOR COPPER CONTROL CABLES SHALL BE 1.5 MM^2.

3.3.2 Screened Control cables for Analogue signals:

These shall be used for carrying out analogue signals. Multi-stranded base annealed copper conductor, PVC insulated, cores colour coded, laid up, screened by braiding with ATC copper wire and finallyoverall PVC sheathed. Sizes of the cables shall be as specified in schedule of quantities/approved drawings.These cables shall be with armouring unless specified other wise in Schede of qualities/approved drawings.

3.4 Cable Trays:

These shall be perforated type heavy duty, return flage or inward bend shape, manufactured from mild steel conforming to IS 226 and hot dip galvanised as per IS 2629/ BS 729. The width of cable trayshall be as per the requirement. Height must be minimum 50 mm and thickness of plate to be 1.5 mm up to 300 mm cable tray width. For cable trays having width more than 300 mm height must be 75 mm and thickness of plate to be 2 mm. Cable trays must be supplied to site in standard lengths of 2.5 M. Necessary accessories of cable trays such as coupler side plates for joining cable trays, bends, outside riser, inside riser, tee etc also to be supplied.Plain cable trays covers 1.5 mm thick to be supplied if specially required. Sample of cable tray to be got approved from Site In charge before supply.

Cable trays for automation network/ instruments/ signal cables shall be separate from the cable trays for power & control cables.

3.5 Cable Glands:

These shallbeprovidedatboth ends of armoured/ un -armoured electrical cables. Cable glands to be manufactured asper performance requirements of BS-6121 amended as on date, with BRASS material accurately machined and NICKEL finish. These shall be of heavy-duty single compression type for cable conductor sizes above 35 mm2 and weather proof double compression type for cable conductor sizes up to 35 mm2. Single compression cable glands must be complete with checknut, gland body, 3 nos. metal washers, and outer seal rubber ring and compression nut. Double compression glands to be complete with checknut, 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 has to be got approved from the NDDB Site In-charge before supply.

3.6 Cable Connectors

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

3.7 Cable Route Markers

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

3.8 Cable Indicators

These shall be self-sticking type and of 2 mm thick lead Strap for overall cable. PVC ferrules with identification numbers shall be used for each wire.

3.9 Pipes for Cables

For laying of cables under floor, GI Class 'A' pipes shall be used. MS conduits are not acceptable for this purpose. For laying cable in the air whereas cable trays are not being used, GI `B' class pipe shall beused. Size of pipe shall depend upon the overall outer diameter of cable to be drawn through pipe. NO

PIPE LESS THAN 40 MM DIA SHALL BE USED FOR THIS PURPOSE. To determine the size of pipe, assume that 40% area of pipe shall be free after drawing of cable. If length of pipe is more than 30 M, free area may be increased to 50%.

In dairy's process area wherever required/specified SS 304 pipe, 1.6 mm thick shall be used. All cable (power/ control/ instrument/ signal) drops shall be in pipes. The open

ends of power/ controlcables at termination shall be protected through suitable conduit. Instrument/ signal/automation cable/wire drops up to termination point shall also be routed through conduits. The automation cables, field bus cables etc shall be laid in cable trays through GI conduit.

3.10 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 and complete with cable gland for incoming and outgoing cables. Final finish of housing to be buffer mirror or powder coated Siemens Grey RAL-7032.

In lieu of Aluminium cast housing, thermoplastic housing with IP 55 protection can also be used. From Isolator to motor, adequately sized flexible copper wire in suitable heavy duty (wire braided/ribbed) PVC flexible conduit must be used.

ForallDirect-On-Line (DOL)Startermotors,Isolatorsof adequate ratings shall be used. Isolator sample must be got approved from the NDDB Site In-charge before supply.

3.11. Motor Junction Box/Control Junction Box

These shall be in Aluminium cast housing, completely dust, vermin and weather proof (IP 55), suitable for 25 A, 415 volts, 50 Hz, with heavy dutyBakelite connector, complete with cable/conduit gland.Sample to be got approved before use.

3.12 Remote Push Button Stations (for Dairies)

These shall be used for remote ON-OFF operation of Star-Delta started motors, away from MCC. These shall be floor/wall-mounted type as specified in schedule of quantities/drawings. These shall be fabricated from 1.6 mm thick Stainless Steel sheets (SS-304). In case of floor-mounted stations, these shall be supported either on 51 mm 'A' class MS pipe cladded with SS or 51 mm □ SS 304 pipe. Front cover shall be removable type with suitable rubber gaskets to make them dust, vermin and moisture proof. All outer SS surfaces shall be polished to 150 grit finishes.

Each feeder of station shall be provided with name plate (white bakelite), LED type indication lamp, one 'ON' (Green) push button and one 'OFF' (Red) mushroom push button turn to lock. Green andRed push buttons shall have contact elements having 1 NO + 1 NC. Number of feeders shall be specified in schedule of quantities/ drawings.

3.13 Remote Push Button Stations (for Other Projects)

These shall be used for remote ON-OFF of Star-Delta started motors,awayfromMCC.Theseshallbesuitablefor surface/structure mounting in Cast Aluminium housing having IP-55 class of protection i.e. completely weather proof.For each motor, one ON, one OFF red mushroom half turn to lock button, one LED type.

indication lamp to be provided with a heavy duty connector inside the housing to receive control cables.If more than one motor is nearby, a common ON-OFF station of suitable size can be used otherwise for one motor one stationcanbeused. Riveted type plastic name plates have to be provided for eachfeeder.If functionally required Ammeter also can be located in such ON-OFF station.

Such ON-OFF push button stations can also be used in dairy projects whenever to be installed in utility buildings such as refrigeration, boiler, water handling etc. or being installed in open (exposed to rains).

4.0 ERECTION OF EQUIPMENT

The cases containing the equipment shall be handed over to the supplier through a Material Transfer Challan (MTC) document. The Supplier shall make own arrangements for safe transportation of alltheitemstotheerectionsiteandalsocarryoutcomplete loading/unloading during transportation. 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 theEngineer-in-chargeor his authorizedrepresentative.
Theseempty packing cases shall be returned to the stores 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.

4.1 Transformer(if applicable in work scope)

4.1.1 Erection

Transformer complete with radiators, bushings, conservator and miscellaneous accessories shall be thoroughly inspected and any damage noticed shall be reported to the Engineer-in-charge. Beforeerection of transformer the level of rails on foundation shall be checked and minor corrections if necessary shall be carriedout. After the completion of erection, necessary stoppers shall be provided at the wheels. All loosely supplied fittings/ accessories shall be cleaned and mounted on the transformer and connections made.If the transformer oil is supplied in drums by the manufacturer, the same shall be tested for dielectric strength etc. and only approved oil "on test" shall be filled into the tank through filtration system. While filling in transformer with oil, samples shall be taken from the bottom and conservator and tested for dielectric strength. Fresh silicagel shall be filled in the breather. After complete assembly/ installation, filling and tapping of the transformer with oil, the transformer shall be cleaned and touch-up paint supplied by the manufacturer applied wherever necessary. All tank cover bolts shall be checked for proper tightness.

The foundation of transformer and rail fixing will be made by some other agency.

4.1.2 Testing

For testing of the dielectric strength of insulating oil in oil-immersed equipment, test samples of oil shall be drawn from equipment after filling. In case oil is supplied in separate containers for filling ortapping up at the site, a test also shall be made with samples drawn from such oil container before the equipment is filled.

Minimumacceptable values for each test will be indicated bythe Engineer-in-charge. However, dielectric strength of oil should be about 40 kV (RMS) for one minute.

By measuring the dielectric strength of the oil in the transformers, if tests indicate the presence of undue amount of moisture, the insulation oil shall be filtered by steam/electrical heater line filter. No extra charges shall be paid for filtration and the supplier shall arrange his own filtration machine, oil testing kit and other accessories.

Winding insulation resistance shall be measured from primary and secondary to ground and between primary and secondary.

Test the operation of Buchholz Relay in accordance with the manufacturer's instructions. Test the operation of the tap changer. Measure whether primary and secondary voltage ratios are as per nameplates. Check the polarity of terminals and the phase's sequence.

4.1.3 Performa for Transformer Tests

1. Transformer Name Plate

2. Insulation resistance test with 1000 V Megger
   a. between primary to earth Mega ohm
   b. Between secondary to earth Mega ohm
   c. Between primary and secondary Mega ohm

3. Dielectric strength of oil in the transformer (test Voltage 40 KV for one minute).

4. Operation of Buchholz relay as per manufacturers Instructions
5. Operation of the tap changerOperation of the tap attap no.1 tap no.2tap no.3 tap no.4 tap no.5
6. Polarity marking and phase sequence.

7. Condition of silicated crystals.
8. Earth resistance: Neutral tank

(This proforma shall be jointly signed by the Engineer-incharge and the supplier).

4.2 Power Control Centres, Motor Control Centres, DistributionBoards, Control Panels & Bus Ducts

4.2.1 Erection

Electrical panels and bus duct shall be delivered in convenient shipping section by the manufacturers. The Supplier shall be responsible for final assembly and inter- connection of bus bars/wiring. Foundation channel shall be grouted in the flooring by the Supplier. Switchgear shall be aligned and leveled on their base channels and bolted or tack welded to them as per the instructions of the Engineer-in-charge. The earth bus shall be made continuous throughout the length. Loosely supplied relays and instruments shall be mounted and connected on the switchgear. The contacts of the draw-out circuit breakers shall be checked for proper alignment and inter-changeability.

After erection the switchboard shall be inspected for dust and verminproofness. Any hole, which might allow dust or vermin etc. to enter the panel, shall be plugged suitably at no extra cost.

If the instrument transformers are supplied separately they shall be erected as per the direction of the Engineer-in-charge. The Supplier shall fix the cable glands after drilling the bottom/ top gland platesof all switchboards with suitable holes at no extra cost.

Rangeofoverloadrelays/timersetc.shallbecheckedwith requirement of motor systems actually tobe connected at site and if the same is under-sized/over-sized, it shall be brought to thenotice of Engineer-incharge, who shall arrange procurement of correct rated components.However, the supplier shall not charge anything extra for labour for such replacements.

The bus duct shall be suitably supported between switchgear and transformer. The opening in the wall where the duct enters the switchgear room shall be sealed to avoid rainwater entry. Thefoundation of the switchgear shall be raised suitably for minor adjustment to ensure proper alignment and connection of the bus duct at no extra cost. Expansion joints, flexible connection, etc. supplied by the manufacturer of the bus duct shall be properly connected.

4.2.2Testing

Before electrical panel is energized, the insulation resistance of each bus shall be measured from phase to ground. Measurement shall be repeated with circuit breakers in operating positions and contactopen.

Beforeswitchgearisenergized, theinsulation resistance of all DC control circuits shall be measured from line to ground.

The following tests shall be performed on all circuit breakers during erection:

i. Contact alignment and wipe shall be checked and adjusted where necessaryinaccordancewiththebreakersmanufacturer's instructions.

ii. Each circuit breaker shall be drawn out of its cubicle, closed manually and its Insulation resistance measured from Phase to phase and Phase to ground.

iii. All adjustable direct acting trip devices shall be set using values given by the Engineer-in-charge/manufacturer.

iv. The dielectric strength of insulating oil wherever applicable shall be checked.

Before switchgear is energized, the following tests shall be performed on each circuit breaker in its test position.

i. Close and trip the Circuit Breaker from its local control Switch, push button or operating handle. Switchgear control bus may be energized to permit test

operation of circuit breaker with AC closing withprior Permission of the Engineer-in-charge.

ii. Test tripping of the electrically operated circuit breaker by operating mechanical trip device.

iii. Test operation of circuit breakers latch, check carriage limit switch, if provided.

iv. Test proper operation of lockout device in the closing circuit, wherever provided by simulating conditions which would cause a lockout to occur.

v. Trip breaker either manually or by applying current or voltage to each of its associated protective relays.

Before switchgear is energized, the test covered above shall be repeated with each breaker in its normal operating position.

Capacitor banks in capacitor control panel shall be tested as per manufacture's instructions. In addition, test for output and/ or capacitance, insulation resistance test and test for efficiency of discharge device shall be carried out.

All electrical equipment alarms shall be tested for proper operation by causing alarms to sound under simulated abnormal conditions.

The Supplier shall arrange testing and calibrations of relays. The testing equipment including primaryand secondary injection sets (if required) etc. shall also have to be arranged by the Supplier. Payment for above work shall be deemed to have been included in the erection costs of switch boards/control panels. No separate payment claim shall be admissible for arranging test kits, tools, tackles etc. at site.

4.2.3 Proforma for PCC, DB, Motor Control Centres test

1. Circuit (breaker or Supplier module designation/ bus no.)

2. Insulation resistance test (contacts open, breaker racked in position).

a. Between each phase of 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 any: : Mega ohm

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/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.

(The Engineer-in-charge and the Supplier shall jointly sign this proforma.

4.3 Sealed Maintenance Free Batteries & Battery Charger

Batteries shall be erected on stands and insulators suppliedbythe manufacturer of the batteries. Interconnectors shall be made withleads supplied by the manufacturer. Filling of electrolyte (suppliedby the manufacturers), charging discharging and recharging shall be carried out under the supervision of the Engineer-in-charge or his authorized representative Erection of battery charger and DC board will be carried out by the Supplier under the supervision of the Engineer-in-charge or his authorized representative. The Suppliershall also offer such facilities as may be required for carrying out tests on the complete battery charger and DC board/AC board.Battery charger shall be tested for proper operation and to verify the charger delivers its maximumrated output.

The Supplier shall supply skilled/unskilled labour for carrying out the test by theengineer-in-charge. Batteries shall be given a boost charge in accordance with the manufacturer's instructions and adjusted for float operation before being placed regular service.

4.4 Motors

4.4.1 Erection and Testing

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. Beforestarting the alignment and coupling of motors with machines and the insulation resistance of the motors will be measured and recorded by the 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 Supplier shall take adequate precaution and care while executing the work.

For all damages incurred due to negligence etc. the Supplier shall be responsible to replace/repair at his own cost. Before connecting power cables to motors the insulation resistance of all motorwindings 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 andauxiliaryapparatussuchaspushbuttonstations,the contactors, 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/ single-phase preventor. Testing of these devices is to be done wherever required as per the instructions of the Engineer-in-charge.

All motors shall run uncoupled for a maximum period of 4 hours before the driven equipment is placed in regular service.

4.4.2 Proforma for motor testing

1. Name plate details: Voltage HP KW
   Mounting Current RPM
   Frame size...Make S No Others
2. Insulation test (before cable connection):
   a. Between phase and earth... Mega Ohms
   b. Between each phase... Mega Ohms

3. Insulation test (after cable connection):
   a. Between phase and earth... Mega Ohms
   b. Between each phase Mega Ohms
4. NoLoadCurrent: R phase Amps
   Y PhaseAmps.
   B PhaseAmps.

5. Full load current:R Phase Amps.

   Y Phase Amps.

   B Phase Amps.
6. Temperature rise after 4 hours run:
   On No Load °C.
   On full load °C.
   Ambient temperature during test °C.

7. Operation of thermal overload relay:
   i. At normal FL current of motor
   ii. At twice FL current of motor, motor trips in ____ Seconds.

   (This proforma shall be jointly signed by the Engineer- in-charge and the Supplier.)

4.5 DG Sets

4.5.1 Erection & Testing

The preassembled DG Set shall be placed over the foundation and aligned properly. Before termination of cable to the alternator, the insulation resistance of the alternator will be measured and bearings shall be checked. All pipe connections etc of the engine shall also be checked. Also, the level of lubricant & coolant in the engine shall be checked. The setting of various protection and releases, power and control circuits of the DG Set Panel shall be checked before switching ON the DG Set.

4.5.2 Proforma for Alternator Testing:

1. Name plate details:Voltage……..HP……
   KW……..Mounting…….. Current…… RPM…….
   Frame Size……. Make……. S.No…….
   Others…….
2. Insulation Test (before cable connection):

   a. Between Phase and Earth

   b. Between Phase to Phase
3. Insulation Test (after cable connection):
   a. Between Phase and Earth
   b. Between Phase to Phase
4. No Load current: R Phase
   Y Phase
   B Phase
5. Full Load current: R Phase
   Y Phase
   B Phase
6. Temperature rise after 4 hours run:
   on No Load
   on Full Load
   Ambient temperature during test
7. Operation of thermal overload relay:
   At normal full load current of motor.
8. No load and full load regulation:

4.5.3 Proforma for Diesel Engine Testing:

1. Speed regulation from no load to full load:

…..…..Mega Ohms. ……. Mega Ohms.

…..…. Mega Ohms. ……. Mega Ohms.

……. Amps. ……. Amps. ……. Amps.…….. Amps.

……. Amps.…….Amps.…….. °C.…….. °C.…….. °C

2. Frequency at no load, 50% load and 100% load:
3. Safety controls and protective devices:
4. Specific fuel consumption:

4.6 TWO/FOUR POLE STRUCTURE

4.6.1 ISMB 200 x 100 mm to be grounded in concrete 1:2:4 for at least 1/5t^h length i.e. 2 meters size of concrete pedestal 500 X 500 mm. All necessary civil works such as excavation, centering, concreting and back filling is included in supplier's scope of work.

4.6.2 Interconnecting by aluminium conductor jumpers with connectors/ PG clamps etc. must be done by the supplier.

4.6.3 Installation, testing and commissioning of complete two/ four pole structure including ISMB & cross channels, G.O. switch, insulators and other items mentioned under equipment supplied for two pole structure.

4.6.4 Complete structure to be provided with two coats of aluminium paint.

5.0 INSTALLATION OF CABLE NETWORK

Cable network shall include power, control and lighting cables which shall be laid in underground trenches, hume 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,cableglandssocketsatbothends,isolators, junction boxes, remote push buttons stations etc. shall be under the scope of the Supplier.

5.1 General requirements for handling of cables.

5.1.1 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 Megger.

5.1.2 The cables shall be supplied at site, wound on wooden drum as faras possible. For smaller length and sizes, cables in properly coiled form can be accepted. The cables shall be laid by mounting the drum of the cable on drum carriage. Where the 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.

5.1.3 Sharp bending and kinking of cables shall be avoided. The bendingradius for PVC insulated and sheath armoured cable shall not be less than 10 D Where `D' is overall diameter of the cable.5.1.4 While drawing cables through GI pipes, conduits, RCC pipe, ensurethat size of pipe is such that, after drawing cables, 40 %
area is free. Afterdrawingcable,theendofpipeshallbesealedwith cotton/bituminous compound

5.1.5 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.

5.1.6 Armouredcablesshallneverbeconcealed in walls /floors/roads without GI pipes, conduits, RCC pipes.

5.1.7 Jointsin the cable throughout its length of laying shall be avoidedas 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.

5.1.8 A minimum loop of 3 M shall be provided on both ends of the cable,or after every 50 M of unjointed length of cable and on both ends of straight through cable joint. Thisadditional length shall be used forfresh termination in future. Cable for this loop shall be paid for supply and laying.

5.1.9 Cable shall be neatly arranged in the trenches/trays in such amanner so that criss-crossing is avoided and final take off to the motor/switchgear is facilitated. Arrangement of cables within the trenches/trays shall be the responsibility of the Supplier.

5.1.10 All cable routes shall be carefully measured and cable cut to therequired lengths and undue wastage of cables to be avoided. The routes indicated in the drawings is indicative only and the same may be rechecked with the Engineer-in-charge before cutting of cables. Whileselectingcableroutes,interferencewithstructures, foundations, pipeline, future expansion of buildings, etc. should be avoided.

5.1.11 All temporary ends of cables must be protected against dirt andmoisture 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 cables shall be plumbed with lead alloy.

5.1.12

Wherevercablerisesfromunderground/concretetrenchestomotors/switchgears/push buttons, these shall be taken inG.I.Pipes of suitable size, for mechanical protection up to 300 mm distance of concerned cable gland or as instructed by the Engineer-in-charge.

5.1.13 Where cables pass through foundation/walls of other undergroundstructures, the necessary ducts or openings will be

provided in advance for the same. However, should it become necessary to cutholes in existing foundations or structures, the electrical Supplier shall determine their location and obtain approval of the Engineer-in-charge before cutting is done.

5.2 Laying of Cables (Underground System)

5.2.1 Cables shall be so laid in ground that these will not interfere withother 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.

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

5.2.3 Sand bedding 75 mm thick shall be made below and above thecables. 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.

5.2.4 For all underground cables, route markers should be used.

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

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

c. Cable markers should be installed at an interval not exceeding50 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.

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

5.3 Laying of Cables Under Floors

5.3.1 GI Class 'A' pipe shall be used for laying of outgoing cables fromdistribution boards to motors, isolators/junction boxes of motors, starter of motors and push button stations. Preferably one cable shall be drawn through one 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%.

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

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

5.3.4 Exact location of equipment motor/isolator/push buttons etc. shallbe ascertained prior to laying of pipe.

5.4 Laying of Cable in Masonry Trenches

5.4.1 Masonry/concrete trenches for laying of cable shall be provided byOwner. However steel members such as MS angles/flats etc shall be provided &grouted by electrical 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 numbers of cables are more. If required, cable trays can also be provided in trenches.

5.4.2 Entry of cables in trenchesshall be sealed with bituminousMASTIC compound to stop entry of water in trenches.

5.5 Laying of Cables in Cable Trays

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

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

5.5.3 Earthing flat/wire can also be laid in cable tray along with cables.

5.5.4 After laying of cables minimum 20% area shall be spare.

5.6 Laying of Cables on Building Surface/Structure

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

5.6.2 Cables shallbe 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 upto 25 mm overall diameter and maximum 1000 mm for cables larger than 25 mm. Unsightly sagging of cables shall be prevented. Only aluminium/GI clamps with GI bolts/nuts shall be used.

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

5.7 Termination and Jointing of Cables

5.7.1 Use of Glands

All PVC/ XLPE cable up to 1.1 KV grade, armoured or unarmoured shall be terminated at the equipment/junction box/ isolators/push buttons/controlaccessories,etcbymeansofsuitablesizecompression type cable glands. Armour of cable shall be connected to earth point.The 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 hole should be drilled in the bottom plate for all the cables in one line,then bottom plate should be split in two parts along thecentre line of holes. After installation of bottom plate and cables with glands, it shall be sealed with cold sealing compound.

5.7.2 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 equipmentends are suitable for direct jointing without lugs/sockets.

The following is the recommended procedure for crimped joints and the same shall be followed:

a. Strip off the insulation of the cable ends with every precaution not to severe or damage any stand. All insulations to be removed from the stripped portion of the conductor and ends of the insulation should be clean and square.

b. The cable should be kept clean as far as possible before assembling it with the terminal/socket. For preventing the ingress of moisture and possibilityofre-oxidationaftercrimpingofthealuminium conductors, the socket should be fitted with corrosioninhibiting compound. This compound should also be applied over thestripped portion of the conductor and the palm surface of socket.

c. Correct size and type of socket/ferrule/lug should be selected depending on size of conductor and type of connection to be made.

d. Make the crimped joint by suitable crimping tool.

e If after crimping the conductor in socket/lug, some portion of the conductor remains without insulation the same should be covered sufficiently with PVC tape.

5.7.3 Dressing of Cable Inside the Equipment

After fixing of cable glands, the individual cores of cable shall be dressed and taken along the cable ways (if provided) or shall be fixed to the panels with polyethylene straps. Cable shall be dressed insuch a manner that small loop of each core is available inside the panel.

For motors of 20 HP and above, if terminal box is not found suitable for proper dressing of aluminium cables, the Supplier shall modify the same without any additional cost.

Cables inside the equipment shall be measured and paid for.

5.7.4 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 inthe 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 numbers shall be as per schematic/ connectiondrawing. For power circuit also wire numbers shall be provided if required as per the drawings of switchgear manufacturer.

5.7.5 Cable between Isolators/Junction Box & Motors/Controls

Wherever possible, Copper Conductor Armoured cables with glands shallbeusedbetweenisolator/junctionbox (installednear motor/controls) and motors/controls. However, if terminal box of themotor 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.

5.7.6 Termination of cables of 6.6 kV and above shall be carried out using heat shrinkable sleeves. This termination must be weather resistant.

5.8 Testing of Cables

5.8.1 Before energizing, the insulation resistance of every circuit shall bemeasured from phase to phase and from phase to ground. This requires 3measurementsifonesideisgroundedand 6 measurements for 3 phase circuits.

5.8.2 Where splices or terminations are required in circuits rated above650 volts, measure insulation resistance of each length of cable before splicing and/or terminating. Report measurements after splices and/or terminations are complete.

5.8.3 DC High Voltage test shall be made after installation on the following:

a. All 1100 Volts grade cables in which straight through joints have been made.

b. 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 detailed below:

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

The test voltage and duration shall be as per relevant codes and practices of Indian Standards Institution.

5.9 Proforma for Testing Cables Date of Test:

a. Drum No from which cable is taken

b. Cable from _____ to _____Meter.

c. Length of run of this cable _____ Meter.

d. Insulation Resistance test:

Voltage of Megger: _____Volts

i) between core-1 to earth …….. Mega-ohm

ii) between core-2 to earth …….. Mega-ohm

iii) between core-3 to earth …….. Mega-ohm
iv) between core-1 to core-2..... Mega-ohm
v) between core-2 to core-3 ……..Mega-ohm
vi) between core-3 to core-1 ……..Mega-ohm

e. High Voltage Test Voltage Duration
i) between cores and earth
ii) between individual cores
(This proforma shall be jointly signed by the Engineer-in-charge and the Supplier).

6.0 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 thereunder. The 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.

6.1 Earth Pit with Electrode

6.1.1 Plate or pipe type earth electrode with earth pit shall be provided forthis work unless otherwise advised by the Engineer-in-charge due to typical site conditions. Earthing electrode and pit shall be as per IS: 3043-1987 (Code of Practice for Earthing). All earth electrodes shallpreferably 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).

6.1.2 Earth pit centre shall be at a minimum distance of 3 m from nearestbuilding, unless otherwise advised. The minimum 3 m distance shall be maintained between centres of 2 earth pits.

6.1.3 Earthing electrodes for Main Lighting Panel shall be Plate Type with double earthing.

6.2 Earth Bus, Earthing Lead and Earth Wire/Strip

6.2.1 All electrical equipment is to be doubly earthed by connectingtwo-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 armour will be earthed through the cable glands. Conductor size for connection to various equipments shall be as specified in the drawing, as instructed by the Engineer-in-charge. However, the length of the branch leads from equipment to earthing grid/ring shall not be more than 10 to 15 meters.

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

6.2.3 Size of earthing lead/ wire shall be as specified in schedule ofquantities/drawings. Following table may be considered as general guidelines:

Control Switches/ Remote Push ButtonStations	GI Wire 14 SWG/ PVCinsulated Copper 2.5mm^2 flexible wire
Motors/ Isolators up to 10 HP	GI Wire 8SWG/ PVCinsulated Copper 4 mm^{2}flexible wire
Motors above 10 HP up to 125 HP	GI Strip 25 X 3 mm

Motor above 125 HP	GI Strip 25 X 6 mm
Switch Board/Motor Control Centre/ DGSet Control Panel	GI Strip 50 X 6 mm
Power Control Centre/ LT Panel of Sub Station	GI Strip 50 X 6 mm

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 ohm in order to ensure satisfactory operation of protective devices.

6.2.4 GI Wire/ Copper wire shall be connected to the equipment byproviding crimping type socket/lug.

6.2.5 Wherever earthing strip to be provided in cable tray, it shall be suitably clamped on cable tray and electrically bonded to the cable tray at regular intervals.

6.2.6 Excavating & refilling of earth, necessary for laying undergroundearth bus loops shall be responsibility of the Supplier.

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

6.2.8 The neutral of the Transformer & DG Set shall be connected withdouble copper strips to earth pit independently and earth pit shall have copper plate electrode of 600 X 600 X 3.15 mm.

6.2.9 Long runs of GI Strip shall be connected at each end with lap typewelding (with minimum 50 mm overlapping) to ensure continuity.

7.0 BIS Standards for Electrical Erection

Following BIS Codes and other standards/codes relevant to the works under scope of the Supplier shall be followed. In absence of BIS codes equivalent/ relevant IEC Codes shall be followed.

BUREAU OF INDIAN STANDARD CODES TO BE FOLLOWED FOR ELECTRICAL ERECTION WORKS

PVC insulated cables (light duty) for working voltage up to & including 1100 volts	694-1990 Part I & II
PVC insulated cables (heavy duty) for Voltage up to 1100 volts	1554-1988 Part I
-- do -- for voltage 3.3 KV to 11 KV	1554-1988 Part II
Guide for marking of insulated conductors	5578-1984
Code of practice for installation andmaintenance of power cables up to and including 33 kV rating	1225-1983
Code of practice for earthing	3043-1987
Recommendations on Safety Procedures andPractices in Electrical Work - Part I: General	5216-1982 Part - I
Recommendation on Safety Procedures and Practices in Electrical Work - Part II : Life Saving Techniques	5216-1982 Part II
Code of practice for installation and maintenance of induction motors	900-1992
Code of practice for selection, installation and maintenance of Switchgear and Control gear	10118-1982 Part I,II,III,IV
Code of practice for selection, installation and maintenance of Transformers	10028-1985 Part-I, II, III
Code of Practice for Electrical Wiring Installations	732-1989
Guide for Testing Three-Phase InductionMotors	4029-1967
XLPE Cables for working voltage up to and including 1100 Volts	7098- 1988 Part -I
----do--- up to 33 Kv	7098 – 1988 Part - II
General Requirements for Enclosures for Accessories for Household and similar FixedElectrical Installations	14772 - 2000
Specification for Electric Power Connectors	5561- 1970

Methods of Test for Cables	10810 – 1984
National Electrical Code	SP: 30

8.0 Motor Starter Selection Table

The following selection table shall be generally followed for starters of motorfeedersunlessotherwisespecified.However, technical requirements/specifications, if any, mentioned under Section VI, will supersede the table given above.

Sr.No	415 V Motor HP	Contactor Rating amps.	MCCB Rating Amp.	MPCB Rating Amp.	Type of Starter
	Up to 3 HP	9	-	9	DOL
	5 to 10 HP	16	-	16	-do
	12.5 to 15 HP	25	-	25	Star Delta
	20 to 25 HP	-	-	40	Soft Startner
	30 to 35 HP	-	-	50	-do-
	40 HP	-	63	-	-do-
	45 HP	-	100	-	-do-
	50 to 60 HP	-	125	-	-Do-
	65 to 70 HP	-	200	-	
	75 to 90 HP	-	200	-	
	100 – 125 HP	-	250	-	-
	150 to 180 HP	-	400	-	
	200 to 250 HP	-	400	-	
	275 to 400 HP	-	630	-	

For capacitor feeders, special capacitor duty contactors of suitable rating shall be provided.

Variable Frequency Drives may be provided in lieu of Soft Starters for higher size motors like Ammonia Screw Compressors, Blower Fans etc as per Technical Specifications at Section-VI and approved drawings.

9.Power Cable Selection Tables - Cable selection charts are to be followed for Ambient Air Temperature of 40°C and Ground Temperature of 30°C. Rating factors must be applied while deciding cable size for actual operation applications & conditions of cablelaying i.e. through air,ducts,ground, masonry/structural surfaces, hume pipe, cable tray, pipes, conduits etc.

9.1 FollowingselectiontableshallbegenerallyfollowedforXLPE insulated, Aluminium armoured, 1.1 kV grade power cables for motors, unless

otherwise specified. However, technical requirements/ specifications, if any, mentioned under Section VI, will supersede the table given above

3 Phase, 415 V Motor H.P.	XLPE Insulated, Aluminium Armoured Cables, 1.1 kV grade, Size in mm2			
	DOL/ Soft Starter		Star-Delta Starter	
	Supply side	Motor side	Supply side	Motor side
Up to 7.5 HP	4	4	4	2 X 4
10	6	6	6	2 X 4
12.5	6	6	6	2 X 4
15	10	10	10	2 X 6
20	16	16	16	2 X 6
25	16	16	16	2 X 10
30	25	25	25	2 X 10
40	35	35	35	2 X 16
50	50	50	50	2 X 25
60	70	70	70	2 X 35
75	95	95	95	2 X 50
100	120	120	120	2 X 70
125	185	185	185	2 X 95
150	240	240	240	2 X 120
180	300	300	300	2 X 150
200	2 X 150	2 X 150	2 X 150	2 X 150
250	2 X 185	2 X 185	2 X 185	2 X 185
275	2 X 240	2 X 240	2 X 240	2 X 240
300	2 X 240	2 X 240	2 X 240	2 X 240
425	2 X 400	2 X 400	2 X 400	2 X 400

Above cable selection table is for general guidance only, approvedcable schedule/drawings shall be followed for specific applications/ projects.

Unarmoured flexible Aluminium Cables shall be provided only ifspecifically mentioned in Technical Specifications at Section VI or approved drawings for specific applications/ projects

9.2 Following selection table shall be followed for XLPE insulated, Copperarmoured cables for motors, unless otherwise specified. However, technicalrequirements/specifications,ifany,mentionedunder Section VI, will supersede the table given above.

3 Phase, 415 V Motor H.P.	XLPE Insulated, Copper Armoured Cables, 1.1 kVgrade, Size in mm2			
	DOL/ Soft Starter		Star-Delta Starter	
	Supply side	Motor side	Supply side	Motor side
Up to 7.5HP	2.5	2.5	2.5	2 X 2.5
10	4	4	4	2 X 2.5
15	6	6	6	2 X 2.5
20	10	10	10	2 X 4
25	16	16	16	2 X 6
30	16	16	16	2 X 6
40	25	25	25	2 X 10
50	35	35	35	2 X 16
60	50	50	50	2 X 25
75	70	70	70	2 X 35
100	95	95	95	2 X 50
125	150	150	150	2 X 70
150	185	185	185	2 X 95
180	240	2 X 120	240	2 X 120
200	2 X 120	2 X 120	2 X 120	2 X 120
250	2 X 150	2 X 150	2 X 150	2 X 150
275	2 X 185	2 X 185	2 X 185	2 X 185
300	2 X 850	2 X 185	2 X 185	2 X 185
425	2 X 240	2 X 240	2 X 240	2 X 240

Sr	Motor rating HP	Full load current (Amp)	Type of Starter	Power Cable Rating for LAPP/ Concab cables (at 45 °C)
1	0.5	1	DOL	3 C or 4 C x 1.5 sq. mm
2	0.75	1.3	DOL	3 C or 4 C x 1.5 sq. mm
3	1	1.9	DOL	3 C or 4 C x 1.5 sq. mm
4	1.5	2.6	DOL	3 C or 4 C x 1.5 sq. mm
5	2	3.7	DOL	3 C or 4 C x 1.5 sq. mm
6	3	4.8	DOL	3 C or 4 C x 1.5 sq. mm
7	4	5.2	DOL	3 C or 4 C x 1.5 sq. mm
8	5	7.8	DOL	3 C or 4 C x 1.5 sq. mm
9	7.5	11.2	DOL	3 C or 4 C x 2.5 sq. mm
10	10	16	DOL	3 C or 4 C x 2.5 sq. mm
11	12.5	19	Star Delta	3 C or 4 C x 4 sq. mm (2 runs)
12	15	20.8	Star Delta	3 C or 4 C x 4 sq. mm (2 runs)

13	20	28	Soft Starter	3 C or 4 C x 6 sq. mm
14	25	34	Soft Starter	3 C or 4 C x 10 sq. mm
15	30	40	Soft Starter	3 C or 4 C x 10 sq. mm
16	40	53	Soft Starter	3 C or 4 C x 16 sq. mm
17	50	65	Soft Starter	3 C or 4 C x 25 sq. mm
18	60	78	Soft Starter	3 C or 4 C x 35 sq. mm
19	75	96	Soft Starter	3 C or 4 C x 50 sq. mm
20	100	131	Soft Starter	3 C or 4 C x 70 sq. mm
21	125	156	Soft Starter	3 C or 4 C x 120 sq. mm
22	150	189	Soft Starter	3 C or 4 C x 150 sq. mm
23	180	227	Soft Starter	3 C or 4 C x 185 sq. mm
24	215	271	Soft Starter	3 C or 4 C x 240 sq. Mm
25	250	325	Soft Starter	3 C or 4 C x 300 sq. Mm
26	275	360	Soft Starter	3C or 4C x 185 sq.mm- 2 runs
27	300	390	Soft Starter	3C or 4C x 185 sq.mm- 2 runs
28	335	400	Soft Starter	3C or 4C x 240 sq.mm- 2 runs
29	375	455	Soft Starter	3C or 4C x 300 sq.mm- 2 runs

Above cable selection table is for general guidance only, approved cable schedule shall be followed for specific applications/ projects.

UnarmouredflexibleCopperCablesmaybeprovidedonlyif specifically mentioned in Technical Specifications at Section VI or approved drawings for specific applications/ projects.

9.3 In case LAPP/Concab/Equivalent design of steel braided CopperCables are used then, Minimum size of cables for various rating of motors, to be laid between MCC and Motors shall be as given in table below.

Above cable selection is for guidance only, approved cable schedule shall be followed for specific applications/ projects.

Cables for motors above 20 HP have been indicated considering soft starters.

Unarmoured flexible Copper Cables may be provided only if specifically mentioned in Technical Specifications at Section VI or approved drawings for specific applications/ projects.

SECTION-II

Scope of supply/ Works and Technical specifications FOR:

DESIGN, SUPPLY AND LABOUR JOB FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF EQUIPMENT FOR CONVERSION IN TO AUTOMATIC WEIGHING, CONVEYING AND BATCH MIXING OF RAW INGREDIENTS OF EXISTING CATTLE FEED MANUFACTURING PLANT OF 50 TPD CAPACITY AT BANDOL (DISTRICT-SEONI) UNDER JABALPUR SAHAKARI DUGDHA SANGH MARYADIT, JABALPUR, MADHYA PRADES

TABLE OF CONTENTS

1.0. INTRODUCTION:

Cattle Feed Plant Bandole (District-Seoni) under Jabalpur Sahakari Dugdha Sangh Maryadit, Jabalpur is intent to convert its existing manual batch mixing system in to automatic operation with its existing 50 tpd capacity to improve feed quality and production efficiency.The scope of automation job is as under

1.1. The proposed modification/ automation of existing manual batch mixing system in to automatic operation shall be executed on single responsibility Basis and this contract shall be covering design, supply, erection, testing & commissioning of the entire work for existing 50 TPD Cattle Feed Plant and related Engineering facilities.

1.2. The Bidder shall propose for the requirement of Foundations and civil structure up to plinth level for the proposed modification/ automation of existing manual batch mixing system in to automatic operation , it shall be provided by the purchaser. For this the Bidder shall provide required drawing with machanical load details to prepare civil construction drawing.

1.3. For the requirement of electrical power supply for the MCC/ Control /instrumentation panel the it shall be in the Bidder's scope to make necessary arrangement to draw power supply from existing PCC to the MCC/Control /Instrumentation Panel for the proposed modification/ automation of existing manual batch mixing system in to automatic operation, however bidder shall have to specify load for Electrical power etc.

1.4 The bidder shall be responsible for developing the conceptual layout and flow diagram for the proposed modification/ automation of existing manual batch mixing system in to automatic operation of the existing 50 tpd plant to ensure the optimum investment to meet all the Quality Standard of feed as well as to fulfil the design data and technical specification specified in the Bidding Document within the battery limits.

1.5 As stated earlier the proposed modification/ automation of existing manual batch mixing system in to automatic operation of the existing 50 tpd plant will

have to be executed on a single responsibility basis and the bidder should consider the complete work in its totality. It should be understood that any minor work which may be necessary to achieve the rated capacity of the plant is included in the scope of work, enough not specifically mentioned.

1.6 It is suggested that the bidder visits the site before pricing the bid.

1.7 The the proposed modification/ automation of existing manual batch mixing system in to automatic operation of the existing 50 tpd capacity CFP plant shall be designed, supplied and executed in accordance with the prevailing and applicable:

- Indian Standards
- Indian Boiler Regulations.
- Indian Electricity Rules
- MP State Electricity Board.
- Chief Electrical Inspectorate of MP State
- Indian Explosives Act
- Indian Factory Act
- Indian Pollution Act (MP Pollution Control Board)
- Indian Weights & Measures Act

1.8. And any other applicable Indian Act. Wherever Indian Standards are not available / applicable the bidder shall follow International Standards.

1.9. The bidder shall be responsible for arranging approval from various applicable Indian statutory authorities on behalf of the Purchaser. The statutory fees shall be reimbursed by the Purchaser on production of documentary evidence.

2.0. DESIGN DATA AND DESIGN BASIS

2.1. DESIRED FINISHED PRODUCT

2.1.1.Type of feed manufactured from existing 50 tpd manual plant : for milch cattle only, in pellet form.

2.1.2. **Capacity** : 2.5 MT per hour and 50 MT per day minimum (basedon 20 hours operation)

NOTE : The proposed modification/ automation of existing manual batch mixing system in to automatic operation of the existing 50 tpd cattle feed concentrate manufacturing Cattle Feed Plant plant Plant should be designed and layout made in such that the plant can be easily expanded in future to suitable higher capacity .

2.2. FEED SPECIFICATION

Fat : 2.5 %

Crude Protein : 18 %

Fiber : 10 %

Sand/Silica : 2 %

Moisture : 10 %

3.0 Tendering package:

The scope of work covered in this bidding document is described and specified in two parts with the part (A), describing Design and Supply of plant equipment, while the Part

(B) describes erection, testing and commissioning.

PART (A): Design and Supply of Plant equipment covers the following:

a) Equipment for the proposed modification/ automation of existing manual batch mixing system in to automatic operation of the existing 50 tpd cattle feed concentrate manufacturing plant for the respective sections are as per scope of supply mentioned in clause-4

4.0. . SCOPE OF SUPPLY/WORKS AND TECHNICAL SPECIFICATIONS	
MACHINERY FOR PREPARING ANIMAL FEEDING STUFF (Existing and New for "Batch mixing and Automation")	
(A)	
SECTION WISE BOQ/SCOPE OF SUPPLY	
ITEM	ITEM DESCRIPTION(SECTION WISE)
[A]INTAKE SECTION [B]PRE-WEIGHING SECTION [C]SERVICES [D]DRIVE	[E]DRIVE PARTS [F]ELECTRICALS [G]STRUCTURE [H]FOUNDATION BOLTS

MACHINERY FOR PREPARING ANIMAL FEEDING STUFF

SCOPE OF SUPPLY

ANNEXURE-I

ITEM NO.	ITEM DESCRIPTION (MACHINERIES FOR PROPOSED AUTOMATION WORK)	SIZE/MODEL	HP	QTY	EXISTING /NEW
[A]	INTAKE SECTION				
1	DUMPING HOPPER WITH MAGNETIC GRILL.	800 x 800		1 No.	EXISTING
2	INTAKE CHAIN CONVEYOR.			1 No.	EXISTING
3	INTAKE ELEVATOR.			1 No.	EXISTING
4	JUTE REMOVER			1 No.	EXISTING
5	HUMP MAGNET.			1 No.	EXISTING
6	PNEUMATIC TWO WAY FLAP.			1 No.	NEW
[B]	PRE-WEIGHING SECTION				
1	TOP DISTRIBUTION SCREW CONVEYOR #1	305 Ø x 7.6 m Long	3	1 No.	NEW
2	TOP DISTRIBUTION SCREW CONVEYOR #2	305 Ø x 7 m Long	3	1 No.	NEW
3	PNEUMATIC SLIDE GATE AT ONE OUTLET OF TOP DISTRIBUTION SCREW CONVEYOR.	600 x 400		1 No.	NEW
4	ROTARY DISTRIBUTOR WITH DRIVE.	RD - 4	0.5	1 No.	NEW
5	ROTARY DISTRIBUTOR WITH DRIVE.	RD - 6	0.5	1 No.	NEW
6	PRE-WEIGHING (STORAGE)	8.75 m^3 X 10		1 Set	NEW

	BINS.	Nos.			
7	LEVEL SENSORS IN PRE-WEIGHING BINS.	Suitable		20 Nos.	NEW
8	MANUAL CHAIN GATES AT OUTLET OF STORAGE BINS.	400 x 400		10 Nos.	NEW
9	SCREW DISCHARGERS.	250 Ø x 3 M AVERAGE	30	10 Nos.	NEW
10	BATCH WEIGHING HOPPER.	01 Ton, 5 mm Thick - MS		1 No.	NEW
11	PNEUMATIC SLIDE GATE AT OUTLET OF BATCH WEIGH HOPPER.	600 x 400		1 No.	NEW
12	BATCH COLLECTION HOPPER.	1 t, 3 mm Thick - MS		1 No.	NEW
13	LEVEL SENSOR IN BATCH COLLECTION HOPPER.	Suitable		1 No.	NEW
14	BATCH CHAIN CONVEYOR.	240 x 400, L: 8 m.	3	1 No.	NEW
15	BATCH ELEVATOR	BE 8" X 20 m	5	1 No.	NEW
16	TOP DISTRIBUTION SCREW CONVEYOR #3.	305 Ø x 7.1 m Long	3	1 No.	NEW

17	PNEUMATIC TWO WAY FLAP AT OUTLET OF TOP DISTRIBUTION SCREW CONVEYOR #3.			1 No.	NEW
[C]	SERVICES				NEW
1	PRODUCT PIPING.	200 Ø x 3 mm - MS		1 Lot.	NEW
2	TRANSITION PIECES.	MS - 3 mm		1 Lot.	NEW
3	AIR COMPRESSOR WITH DRIVE.			1 No.	EXISTING
4	COMPRESSED AIR PIPING.	MS `C' CLASS		1 Lot.	NEW
[D]	DRIVES				
A-2	DRIVE FOR INTAKE CHAIN CONVEYOR			1 No.	EXISTING
A-3	DRIVE FOR INTAKE ELEVATOR MOTOR WITH GEAR BOX.			1 Set	EXISTING
A-4	DRIVE FOR JUTE REMOVER MOTOR WITH GEAR BOX.			1 No.	EXISTING

B-1	**DRIVE FOR TOP DISTRIBUTION SCREW CONVEYOR #1 MOTOR WITH GEAR BOX.**		**3**	**1 Set**	**NEW**
B-2	**DRIVE FOR TOP DISTRIBUTION SCREW CONVEYOR #2 MOTOR WITH GEAR BOX.**		**3**	**1 Set**	**NEW**
C-9	**DRIVE FOR SCREW DISCHARGERS MOTOR WITH GEAR BOX.**		**3**	**10 Sets**	**NEW**
C-14	**DRIVE FOR BATCH CHAIN CONVEYOR MOTOR WITH GEAR BOX.**		**3**	**1 Set**	**NEW**
C-15	**DRIVE FOR BATCH ELEVATOR MOTOR WITH GEAR BOX.**		**5**	**1 Set**	**NEW**
C-16	**DRIVE FOR TOP DISTRIBUTION SCREW CONVEYOR #3 MOTOR WITH GEAR BOX.**		**3**	**1 Set**	**NEW**
					NEW
[E]	**DRIVE PARTS**				**NEW**
A-2	**DRIVE PARTS FOR INTAKE CHAIN CONVEYOR**			**1 No.**	**EXISTING**
A-3	**DRIVE PARTS FOR INTAKE ELEVATOR.**			**1 Set**	**EXISTING**
A-4	**DRIVE PARTS FOR JUTE REMOVER.**			**1 No.**	**EXISTING**
B-1	**DRIVE PARTS FOR TOP DISTRIBUTION SCREW CONVEYOR #1.**			**1 Set**	**NEW**
B-2	**DRIVE PARTS FOR TOP DISTRIBUTION SCREW CONVEYOR #2.**			**1 Set**	**NEW**
C-9	**DRIVE PARTS FOR SCREW DISCHARGERS.**			**10 Sets**	**NEW**
C-14	**DRIVE PARTS FOR BATCH CHAIN CONVEYOR.**			**1 Set**	**NEW**
C-15	**DRIVE PARTS FOR BATCH ELEVATOR.**			**1 Set**	**NEW**
C-16	**DRIVE PARTS FOR TOP DISTRIBUTION SCREW CONVEYOR #3.**			**1 Set**	**NEW**

[F]	**ELECTRICALS**				**NEW**
1	**MOTOR CONTROL CENTRE WITH**			**1 No.**	

	AL. BUS BARS, MCCB, MPCB, OLR, CONTACTORS ETC. DOL STARTERS FOR FEEDERS UPTO & INCLUDING 7.5 HP. FASD STARTERS FOR 10 HP AND ABOVE ONLY FOR ADDITIONAL DRIVES INCLUDING VFD FOR BATCHING SECTION..				
2	**PLC BASED BATCHING SYSTEM FOR 10 BINS WITH WEIGHMENT CONTROLLER, LOAD CELLS, DISPLAY, JUNCTION BOX AND PRE-WEIGHING BIN FEEDING SYSTEM CONTROL UPTO BATCH WEIGHING HOPPER'S PNEUMATIC SLIDE GATE.**			**1 Set**	**NEW**
3	**ELECTRIFICATION MATERIALS, VIZ. AL. CABLES, FABRICATED CABLE TRAYS, EARTHING MATERIALS, ISOLATORS, LPBS ETC.**			**1 Lot**	**NEW**
					NEW
[G]	**STRUCTURE**				**NEW**
1	**STRUCTURE FOR PRE-WEIGHING SECTION.**			**20 Tons**	**NEW**
2	**CHEQUERED PLATES FOR FLOORING.**	**5 mm**		**10 Tons**	**NEW**
[H]	**FOUNDATION BOLTS**			**1 Lot**	**NEW**
			48		**NEW**

PART (B): Erection, testing and Commissioning of the the proposed modification/ automation of manual batch mixing system of existing 50 tpd capacity cattle feed concentrate manufacturing Plant involves as follows:-

a) For **Erection, Testing and commissioning of new Plant and Equipment of above scope of supply** for the proposed modification/ automation of existing manual batch mixing system, it includs positioning, placement of equipment on AVMs/foundation if any, bolting, grouting etc complete as per requirement.

b) Laying and testing of the pipe lines for Raw Material (mixed feed, molasses feed, etc) and Services etc, including making necessary trappings with valves and accessories with necessary supports for the various

utilities and services as per the installation and commissioning under scope of new equipment.

c) Erection of plant housing structure complete with platform, chequered plates, ladders, walkways, railings, side cladding, windows etc including installation of plant lighting, shade lighting and other internal electrifications the proposed modification/ automation section of of existing manual batch mixing system in to automatic operation as per the installation and commissioning under scope of new equipment.

d) Erection and commissioning of complete Electricals of the section of proposed modification/ automation of existing manual batch mixing system in to automatic operation including MCCs, Remote control panels, Electric motors, Geared motors, power and control cables, isolators, junction boxes, cable trays, PB Stations etc including testing of the same under scope of new equipment.

e) Installation of the Earthing network consisting of Earth pits ,Earth conductors etc complete for the Electrical installation and equipment provided by the bidder.

f) Erection and commissioning of all other required utilities / services piping for section of the proposed modification/ automation of existing manual batch mixing system in to automatic operation under scope of new equipment.

4.1. RAW MATERIAL RECIVING (Existing)

4.4.1. Material is received in gunny bags transported through Road Carriers. Material will be taken in to the factory between working hours Only.

The vehicle will be arriving at the weigh bridge, where the detailed “Goods Receipt Challan” will be prepared (shall be given at the later stage). The details will be communicated to Store, Quality Control, Production etc.

4.2. RAW MATERIAL QUALITY ANALYSIS

4.2.1 The Quality Control Department shall draw the representative sample of the material received from the truck. The sample will be analyzed for its contents. Based on the Quality parameters, material cleared for unloading or will rejected.

4.2.2 RAW MATERIAL UNLOADING AND STORAGE

4.2.3 The " QC Cleared" material will be received at the Unloading Dock.

The existing dock with proposed extensión as shown in the plan is designed with a shed to safely receive the material even in rainy season. It will also ensure that dust mistarising during unloading is sucked back to minimize dust pollution in this area.

4.2.4 Material from hoppers, will be conveyed in the silos in closed conveyors. The conveyor design will ensure minimum maintenance and flaw less movement of material.

4.2.5 Various material will be unloaded in hoppers by cutting open the sacks and unloaded by manual labor.

4.2.6 RAW MATERIAL CONVEYING FROM RECEPTION HOPPERS TO SILOS/BINS(Existing)

4.2.7 Existing One Intake line (01 Nos. chain conveyors & 1 No. bucket type elevator) of mínimum 800X800 mm size dumping Hopper is available.

4.2.8 One no. Each Hump magnet and jute removing machine in the intake section are available in the existing system.

4.2.9. 01 no. new Pneumatic two way flap is to be provided.

4.2.10. For pre weighing, Batching ,Coarse mixing and Master batch mixing sections **the following Equipment and Machineries are to be supplied as mentioned under new ítem apart from existing one and to be installed and commissioned for the** modification/ automation of existing manual batch mixing system as per latest standard engineering practices of CFP :-

MACHINERY FOR PREPARING ANIMAL FEEDING STUFF

SCOPE OF SUPPLY

ANNEXURE-I

ITEM NO.	ITEM DESCRIPTION (MACHINERIES FOR PROPOSED AUTOMATION WORK)	SIZE/MODEL	HP	QTY	EXISTING /NEW
[A]	INTAKE SECTION				
1	DUMPING HOPPER WITH MAGNETIC GRILL.	800 x 800		1 No.	EXISTING
2	INTAKE CHAIN CONVEYOR.			1 No.	EXISTING
3	INTAKE ELEVATOR.			1 No.	EXISTING
4	JUTE REMOVER			1 No.	EXISTING
5	HUMP MAGNET.			1 No.	EXISTING
6	PNEUMATIC TWO WAY FLAP.			1 No.	NEW
[B]	PRE-WEIGHING SECTION				
1	TOP DISTRIBUTION SCREW CONVEYOR #1.	305 Ø x 7.6 m Long	3	1 No.	NEW
2	TOP DISTRIBUTION SCREW CONVEYOR #2.	305 Ø x 7 m Long	3	1 No.	NEW
3	PNEUMATIC SLIDE GATE AT ONE OUTLET OF TOP DISTRIBUTION SCREW CONVEYOR.	600 x 400		1 No.	NEW
4	ROTARY DISTRIBUTOR WITH DRIVE.	RD - 4	0.5	1 No.	NEW
5	ROTARY DISTRIBUTOR WITH DRIVE.	RD - 6	0.5	1 No.	NEW
6	PRE-WEIGHING (STORAGE) BINS.	8.75 m^3 X 10 Nos.		1 Set	NEW
7	LEVEL SENSORS IN PRE-WEIGHING BINS.	Suitable		20 Nos.	NEW
8	MANUAL CHAIN GATES AT OUTLET OF STORAGE BINS.	400 x 400		10 Nos.	NEW
9	SCREW DISCHARGERS.	250 Ø x 3 M AVERAGE	30	10 Nos.	NEW
10	BATCH WEIGHING HOPPER.	01 Ton, 5 mm Thick –		1 No.	NEW

		MS			
11	PNEUMATIC SLIDE GATE AT OUTLET OF BATCH WEIGH HOPPER.	600 x 400		1 No.	NEW
12	BATCH COLLECTION HOPPER.	1 t, 3 mm Thick - MS		1 No.	NEW
13	LEVEL SENSOR IN BATCH COLLECTION HOPPER.	Suitable		1 No.	NEW
14	BATCH CHAIN CONVEYOR.	240 x 400, L: 8 m.	3	1 No.	NEW
15	BATCH ELEVATOR	BE 8" X 20 m	5	1 No.	NEW
16	TOP DISTRIBUTION SCREW CONVEYOR #3.	305 Ø x 7.1 m Long	3	1 No.	NEW

17	PNEUMATIC TWO WAY FLAP AT OUTLET OF TOP DISTRIBUTION SCREW CONVEYOR #3.			1 No.	NEW
[C]	SERVICES				NEW
1	PRODUCT PIPING.	200 Ø x 3 mm - MS		1 Lot.	NEW
2	TRANSITION PIECES.	MS - 3 mm		1 Lot.	NEW
3	AIR COMPRESSOR WITH DRIVE.			1 No.	EXISTING
4	COMPRESSED AIR PIPING.	MS `C' CLASS		1 Lot.	NEW
[D]	DRIVES				
A-2	DRIVE FOR INTAKE CHAIN CONVEYOR			1 No.	EXISTING
A-3	DRIVE FOR INTAKE ELEVATOR MOTOR WITH GEAR BOX.			1 Set	EXISTING
A-4	DRIVE FOR JUTE REMOVER MOTOR WITH GEAR BOX.			1 No.	EXISTING
B-1	DRIVE FOR TOP DISTRIBUTION SCREW CONVEYOR #1 MOTOR WITH GEAR BOX.		3	1 Set	NEW
B-2	DRIVE FOR TOP DISTRIBUTION SCREW CONVEYOR #2 MOTOR WITH GEAR BOX.		3	1 Set	NEW
C-9	DRIVE FOR SCREW DISCHARGERS MOTOR WITH GEAR BOX.		3	10 Sets	NEW
C-	DRIVE FOR BATCH CHAIN		3	1 Set	NEW

14	**CONVEYOR MOTOR WITH GEAR BOX.**				
C-15	**DRIVE FOR BATCH ELEVATOR MOTOR WITH GEAR BOX.**		**5**	**1 Set**	**NEW**
C-16	**DRIVE FOR TOP DISTRIBUTION SCREW CONVEYOR #3 MOTOR WITH GEAR BOX.**		**3**	**1 Set**	**NEW**
					NEW
[E]	**DRIVE PARTS**				**NEW**
A-2	**DRIVE PARTS FOR INTAKE CHAIN CONVEYOR**			**1 No.**	**EXISTING**
A-3	**DRIVE PARTS FOR INTAKE ELEVATOR.**			**1 Set**	**EXISTING**
A-4	**DRIVE PARTS FOR JUTE REMOVER.**			**1 No.**	**EXISTING**
B-1	**DRIVE PARTS FOR TOP DISTRIBUTION SCREW CONVEYOR #1.**			**1 Set**	**NEW**
B-2	**DRIVE PARTS FOR TOP DISTRIBUTION SCREW CONVEYOR #2.**			**1 Set**	**NEW**
C-9	**DRIVE PARTS FOR SCREW DISCHARGERS.**			**10 Sets**	**NEW**
C-14	**DRIVE PARTS FOR BATCH CHAIN CONVEYOR.**			**1 Set**	**NEW**
C-15	**DRIVE PARTS FOR BATCH ELEVATOR.**			**1 Set**	**NEW**
C-16	**DRIVE PARTS FOR TOP DISTRIBUTION SCREW CONVEYOR #3.**			**1 Set**	**NEW**

[F]	**ELECTRICALS**				**NEW**
1	**MOTOR CONTROL CENTRE WITH AL. BUS BARS, MCCB, MPCB, OLR, CONTACTORS ETC. DOL STARTERS FOR FEEDERS UPTO & INCLUDING 7.5 HP. FASD STARTERS FOR 10 HP AND ABOVE ONLY FOR ADDITIONAL DRIVES INCLUDING VFD FOR BATCHING SECTION..**			**1 No.**	
2	**PLC BASED BATCHING SYSTEM FOR 10 BINS WITH WEIGHMENT**			**1 Set**	**NEW**

	CONTROLLER, LOAD CELLS, DISPLAY, JUNCTION BOX AND PRE-WEIGHING BIN FEEDING SYSTEM CONTROL UPTO BATCH WEIGHING HOPPER'S PNEUMATIC SLIDE GATE.				
3	**ELECTRIFICATION MATERIALS, VIZ. AL. CABLES, FABRICATED CABLE TRAYS, EARTHING MATERIALS, ISOLATORS, LPBS ETC.**			**1 Lot**	**NEW**
					NEW
[G]	**STRUCTURE**				**NEW**
1	**STRUCTURE FOR PRE-WEIGHING SECTION.**			**20 Tons**	**NEW**
2	**CHEQUERED PLATES FOR FLOORING.**	**5 mm**		**10 Tons**	**NEW**
					NEW
[H]	**FOUNDATION BOLTS**				**NEW**
1	**FOUNDATION BOLTS.**			**1 Lot**	**NEW**
					NEW
			48		**NEW**

4.2.11. **Molasses mixing and conditioning**.

Existing system.

4.2.12 PLANT HOUSING.

4.2.13 The existing Production block is in concrete and tiled. For above section the plant housing .i.e, plant steel structure including staircase should be provided by **the** Bidder.**Pre-coated sheets for side cladding & roof shall be done by the Purchaser**. All proposed bins etc. Shall be of Square type and **Purchaser shall provide Control room and links of plant with godowns with RCC roof.**

4.3.0 ELECTRICALS AND CONTROLS (General)

(For reference of ítems under scope of supply only)

4.3.1 Power supply : bidder's scope shall start from existing PCC Panel to provide required load capacity feeder/MCCB to operate section of the proposed modification/ automation of existing manual batch mixing system in to automatic operation of the existing 50 tpd cattle feed concentrate manufacturing Cattle

Feed Plant. The following shall be applicable if falls under scope of supply of electrical equipment:

4.3.2 Up to 10.0 HP motors, DOL starters to be used and above 10.0 HP, Soft Starters to be used. Soft starters used to be indicated.

4.3.3 Class 1 Efficiency, Squirrel cage 3 phase, TEFC, IP-54/55 induction motors for all equipment for the proposed automation.

4.3.4. Motor control centre for section of the proposed modification/ automation of manual batch mixing system in to automatic operation of the existing 50 tpd cattle feed concentrate manufacturing Cattle Feed Plant to be at one centralized room. This MCC should be in minimum two subsections withseparate incomers from LT. Operation of batching and aspiration sections of plant should be from Operating Station in the control Room. All other sections to have Remote Control Panels to enable operator level ON/OFF control. All pneumatic operation of flaps shall be from control room.

4.3.5. Preparation of batch and discharge of mixed batch after mixer to be controlled & monitored by PLC and data to be monitoring by Operating Station in a Control Room. PLC system shall have enough capacity for operating and all the plant including monitoring of utilities. Uninterrupted power supply (UPS) required for PLC system is also to be provided by bidder.

4.3.6. For low speed machines, geared motors (gear box and electric motor being integral unit) or gear box with motors to be used connected with coupling/chain, unless specified otherwise in equipment specification

4.3.7. All power and control cables within production block for the proposed modifications work to be armored and laid in cable trays and finally to equipment through conduit pipes.

4.3.8. Light fittings of proposed section under modifications of production block to be Industrial type, LED type & shall be suitable for proper illumination to be used. (Consider energy saving electrical fittings.)

4.3.9. All DOL started motors should be provided with isolators near the motors for power isolation and all Soft starters to be provided with lockable OFF Push button. Double earthing for the installation is essential.

4.3.10. Light fittings including cabling and panel for proposed section under modifications of Production block shall be in the scope of the bidder.

4.4.3. **AUTOMATION & INSTRUMENTATION**

The Instrumentation & Automation system for the proposed section uner modifications shall be designed, supplied and commissioned to enable the operation of the plant in a safe, efficient and reliable manner, within plant operational limits and ensuring the overall plant performance.

The Instrumentation & Automation System shall be designed utilizing state-of-the-art technology.

(a) High degree of System availability and reliability.

(b) Low downtime and high meantime between failures.

(c) System flexibility and modular expansion capability.

(d) Safety of the main equipment, system and operating personnel.

(e) Consistent product quality using Advance Predictive Control System.

Control & Monitoring Philosophy:

The Instrumentation & Automation System shall be configured to perform the following basic functions:-

(a) Start-up and shutdown of major equipment of the proposed section uner modifications of the plant maintaining the operating conditions.

(b) Safe emergency shutdown of the plant in case of abnormal plant operation.

(c) Regulations function for various valves to achieve guaranteed performance.

(d) Protection of plant equipment and monitoring of equipment life.

(e) Acquisition, display and archiving of plant data under modifications and generation of reports.

(f) Predictive Maintenance System for the plant equipment.

PLC has been envisaged for control & monitoring of the proposed section uner modifications of the plant.

The operation and monitoring under all regimes of operation i.e., start-up, normal operation, shutdown etc. shall be possible through operator's

consoles in Control Room for the operation of the proposed section uner modifications.

HMI (Human Machine Interface) panel to be provided for monitoring and control of raw material reception activity and shall be connected to the main control network for interfacing with the main PLC system.

PLC should also receive data from PC based transmitting units installed in the weigh hoppers.

The control system proposed for the proposed section uner modifications of the plant fully automatic using PLC. All the operations from Raw Material intake, conveying & storage, Loss in weight type conveying system, batch preparation & mixing, Molasses mixing, including Aspiration system operations are automated and
are controlled from control system. All the data referring to raw materials,
are made available for transfer to the main PLC system.

The automatic control should include starting operation, operation on product, shut down and Batch Processing

The Raw Material shall be received shall be weighed and transferred to storage silos. From there as per the recipe selected from the OS, all the material shall be transferred to mixing hopper. Once the batch of raw material is prepared, the loading is done through “Loss in Weight” concept

All the operations runs in auto sequence from control room.

All the operations under scope are controlled only from the control room and not locally.

The automation system should be capable of operating continuously in the ambient temperature experienced in the plant. The system should be able to record and report all the production parameters. The sections to be controlled through OS (operating station) installed in the Control Room through PLC system

There shall be no hardware handshake signals with the main PLC systems. All the

systems must communicate digitally to have better information Exchange Bidder to consider all the necessary Hardware, Software and UPS system for the Automation system.

4.4.4 Instrumentation: GENERAL

Field Instruments shall be suitable for area in which these are located. In general, field instruments shall be weatherproof, dust tight and corrosion resistant with Protection Class IP-65. Field instruments shall be suitably mounted, supported and terminated in local junction boxes.

Die cast aluminium or stainless steel casing shall be used as case material in general.

Dial size for all pressure and temperature gauges shall be 150 mm and any lower size selection specific to the application shall be subject to the Owner/Engineer's approval.

In general the minimum accuracy of the instruments shall be as below:

Electronic transmitters : ± 0.15 % of FSD;

Pressure & temperature gauge : ± 1.0 % of FSD;

Level gauges :± 5.mm of the reading;

The repeatability of pressure, temperature, level and flow switches shall be ± 2.0 % of FSD.

Temperature stub to be welded on process pipe / vessel and shall match with thermo well process connection and size. Thermo well shall be drilled out of bar stock and the length & construction shall comply with process requirement / relevant standards. Material of construction of thermowell shall be SS 316 / Hastelloy etc. suitable for the application.

The cable inlet at the instruments mounted on the plant will have a female threaded connection for protection pipe with nominal diameter 1/2" NPTF.

The instruments pneumatic connections will be 1/4" NPT female.

All field instruments / equipments shall be provided with stainless steel (SS) tag plates with engraved tag no. and service description. The tag plate shall be secured to the instrument / equipment with SS chain.

4.4.5. WEIGHING SYSTEMS FOR BATCH:

Weighing system shall be new generation weight transmitter providing highest performance and most sophisticated functionality

Technical Specification:

Load cell - IP68, Hermetically sealed.

Type - Compression / Shear beam type.

Construction - SS, with self alignment type integral jacking arrangement.

Installation: Without dummy load cell & tie rods, minimum 4 load cells / batch weigher hopper.

Indicator:

Six digit display.

24 bit A/D converter.

SS field mounted junction box with IP67 protection. Auto diagnostics.

Suitable for digital communication with the DCS.

3.21 SERVICES

For providing electric power to all the equipment, MCC in one or more sectionsis provided in the control room which is connected by cables to all machines/control desk and remote control panels. A OS in the plant shall be provided for operating the plant which shall control all remote panels in each area for intake, including automatic batching operation.PLC system shall control the overall plant operation and also controls the batching.

There are number of pneumatic flaps in the plant specially in batching section for controlling the flow of material. For operation of these flaps, compressed air is produced by compressors and then stored in receivers before feeding to various aspiration systems.

Utilities compressed air,(under scope) soft/raw water, electricity shall be controlled locally .

consumption points via piping. Moisture is removed from compressed air by moisture separators. Compressed air is also used for operation of jet filters of

NOTE : The above list of equipment under scope of supply is as per preliminary design for the proposed automation of the plant. The detail list of equipment & their individual capacity may very as per detailed engineering of the bidder to achieve the MINIMUM rated capacity of 50

MTPD. Extra items if any if required by the bidder shall be quoted in the item under extra items of the Price bid.

4.4.6 TECHNICAL SPECIFICATIONS FOR KEY EQUIPMENTS

(BELOW GIVEN ARE GENERAL FOR PLANT AND EQUIPMENT OF CATTLE FEED PLANT, APPLICABLE ONLY WHICH ARE RELEVENT FOR OF THE ITEMS FALLS UNDE SCOPE OF SUPPLY FOR THE PROPOSED AUTOMATION)

A) TECHNICAL SPECIFICATIONS FOR FEED MILLING EQUIPMENT

The following may be noted with respect to the technical specifications of the supply of feed milling equipments.

1. Capacities of all machines and hoppers as specified in the list of equipment to be supplied are based on existing.
2. All machines are to be provided with motor and drive parts, although motors are listed separately in the list of equipment to be supplied.

The term drive parts covers the supply of items as follows:

2.1 Chain drive: - Driving and driven sprockets, required length of simplex/duplex chain with closing links and key in the driven shaft.

All the sprockets should be of MS and flame hardened.

2.2 V belt drive:- Driving and driven pulleys, required no., type and length of V belts, key in driven shaft and slide rails for motor.

2.3 Direct coupled drives:- Suitable coupling with accessories and key in driven shaft.

Apart from the above, the supply of base frame for motor/geared motor and drive guard is also included in drive parts.

3. Packing for flanged joints of machines should be felt or rubber depending on the application.
4. Discharging angle of raw material in general should be as per standard.
5. All equipment should have suitable provision for inspection, lubrication and maintenance.
6. All equipment in general should have dust proofing arrangement.
7. All equipment should be supplied with first charge of lubricant (grease/gear oil) etc.

8. Three sets of installation, operation and maintenance manuals of all machines should be supplied. One set should be sent with the equipment along with the dispatch documents while the two sets is to be handed over to the client controlling office.

B) CONVEYING & HANDLING EQUIPMENT

1. CHAIN CONVEYORS

Chain conveyors under scope are required to carry grains and meals like materials horizontally or at an inclination not exceeding 5 degree.These shall be of dust proof and bolted design, having steel plate casing (Bottom 5 mm, side 4 mm & top cover from 3 mm plate), screw type chain tensioning device, conveying chain wheel of hardened special steel, shaft supported on both sides in pillow block bearings, exchangeable wear rail to be provided at trough top & bottom for chain guide, conveying chain to be Drag Bush Chain type of sufficient breaking load with special steel & case hardened parts, nylon wear pads to eliminate metal to metal contacts, necessary inlets & outlets to be provided. Conveyor to be run by horizontal foot mounted geared motor with chain drive parts etc of suitable HP but all drive output RPM shall be 23-25. Chain linear speed not to exceed 0.5 m/sec.

2. SCREW/PADDLE CONVEYORS/DISCHARGERS

Screw Conveyors are required to convey/distribute grains & meal like materials, horizontally or at inclination (maximum 15 Deg.) for lengths not exceeding 20 M. These shall be of dust-proof design, having steel construction, flanged bearing with stuffing boxes, intermediate hanger bearings with maintenance - free special nylon bushes, screw or paddle flights of steel of uniform pitch welded on screw shaft, necessary inlet & outlet. Overflow flap with limit switch at discharge end to be provided. Trough and flight from 3mm thk plate and 5 mm thk plate respectivley, saddles - 5 mm thk plate, end plate from 8mm thk, screw pipe - C class erw pipe and top cover is from 2mm thk MS plate. Conveyor to be run by foot mounted horizontal geared motor and coupling.

3. BUCKET ELEVATORS

Bucket elevators are required to convey grains and meal like materials vertically.

These shall be of dust-proof design, having steel construction, two leg bolted trough type, food and oil resistant antistatic belting of PVC - lined fabric, pressed steel buckets, Elevators boot with two inlets, screw type belt tightening device, top hood with rubber lagged crown pulley, and wear resistant front plate, bottom pulley cage type. , Rubber Belt - 500 /4 ply Nylon / M24 grade with 3mm thickness on top and 1.5mm thickness on bottom rubber cover black, pressed steel buckets Elevatorto be provided with necessary clean out slides, aspiration filter unitinspection windows, back stop, casing retention frame and leg spacers. Elevator to be run by a foot mounted horizontal geared motor, and chain type direct coupling drive parts.

OUTPUT RPM - 70 -90, BELT SPEED NOT TO EXCEED 2 M/SEC. PLATE THICKNESS OF TROUGHS 2 MM MS PLATE AND PLATE THICKNESS OF BUCKETS 2.0 MM MS, TOP HEAD - 4 MM & 3 MM THICK MS PLATE, BOTTOM HEAD - 4MM THICK MS PLATE, FOUNDATION PLATE - 10 MM THICK MS PLATE.

4. SLIDE GATES

These are required in feed plant for regulating the flow of material. These shall be manually / pneumatically operated complete in all respects. Main body from 75 x 40 mm MS ISMC or suitable fabricated channels. The slide gates are complete with limit switches/reed switches (where applicable) to indicate the position of the gate to control room. For pneumatic slide gates necessary solenoid valve and air cylinder included. Thickness of the gate plate is minimum 5mm.

5. TWO/THREE WAY FLAPS

These are required in feed plant for diverting the flow of material. Flaps to be manufactured from minimum 2 mm thick sheet steel & with inlet & outlet.Flaps to be fabricated from sheet steel with inlet & outlet having flanges. These to be pneumatic type for pipe size minimum 200mm.Flaps to be complete with inspection windows, limit switches / reed switches, solenoid valves, pneumatic cyclinders & operating handles etc. The main body of flaps of 3mm MS sheet and solenoid valves suitable for 230V DC.

6. BIN ACTIVATORS

These are required for continuous discharging of mealy products (having tendency of bridging) from bins and silos.

The discharger to consist of dished head in one piece freely suspended from a number of articulated brackets. The round upper part withconnection flange for fastening to the silo/bin discharge. The dished head and the upper part to be separated by beaded flexible sleeve.Flexible sleeve to have excellent tear resistance and durability.The discharge head to be given powerful horizontal thrusts by a sealed, oil lubricated vibrating motor.

7. PAINTING

All the equipment/machineries shall be spray painted first with double coat of anti-corrosive primer and then spray painted with double coat of paint of approved shade before dispatch.

E) WEIGH SCALES

1. BATCH WEIGHER

This is required in feed plant in blending and mixing systems to weigh solids in a hopper for making a batch. The system shall consist of Load cells for batch weigher hopper and connectivity to main DCS system for automatic operation.It is to be designed for stationary execution. Weighing capacity to be as per the design requirement of the plant, load capacity to be approximately 3 times of weighing capacity and digital graduation to be minimum 0.05% of the weighing capacity. Weighing arrangement to be load cells type (minimum 3 nos.). Load cells to be completely hermitically sealed type in dust proof enclosure. The weigh hopper to be supported on load cells and retained in its position by transverse links without distortion. The weight to be digitally displayed on control panel and also to provide output for connection to central data memorizing and processing unit.The weigh hopper to be made of sheet steel with necessary stiffeners, flexible connection, inspection manholes, etc. Weigh hopper to have arrangement for putting standard weights on outside for calibration purpose.

F) INSTRUMENTS

PROCESS TRANSMITTERS

All the Process Transmitters will be based on Fieldbus technology and shall support serial, two way digital communication system. Transmitters shall be provided with Local Digital Indicator.

Measuring ranges of transmitters shall be selected in such a way that the rated value of the measuring variables appears at approx. 50-70% of the span.The sensing elements and internal parts shall be constructed with AISI 316. In case of stock and corrosive fluid application, diaphragm seal type transmitter with capillary is foreseen.Transmitters shall generally be installed on Instrument Stands made of 2" SS pipes located at convenient points.

PROCESS GAUGES

Process gauges shall be provided for local indication on all utility lines.

Pressure gauge sensing element shall be Bourdon / Bellow / Diaphragm type in general depending upon the process condition. Direct reading Pressure / Differential Pressure gauges shall be used of SS 316 sensing element and AISI 304 movement material.

All accessories, such as 2-valve manifold etc. shall be provided with pressure gauges according to application. Where process temperature exceeds 70· C, siphon loops shall be utilized.

Local temperature measurement shall be done bi-metal Temperature gauges. Temperature gauges may be direct mountedtype (multiangle) or with SS capillary extension (at least 3 Mtrs) as per the application area.The sensing element / bulb / capillary etc. shall be of SS 316 for temperature gauges.

PROCESS SWITCHES

Local switches for pressure, differential pressure, temperature, level etc. shall be blind type and shall be suitable for Fieldbus communication.

Set points shall be adjustable throughout the range. Switching differential shall be adjustable.

LEVEL INSTRUMENTS

Flange mounted diaphragm seal type level transmitters shall be used for level measurement on tanks. The wetted parts shall be of SS 316 or suitable material to suit process fluid. The process connection with the tank / vessel shall be 3" flanged.

For clean liquid, water, condensate service etc.(other than milk applications) normal differential pressure type level transmitters shall be used.

Level gauges shall be of the reflex / transparent / tubular type as per the application area and made of stainless steel and fitted with toughened borosilicate glass Each gauge shall be fitted with top and bottom-isolating valves with full bore drain valve at the bottom and plugged vent at the top. Flanged connections, rated same as the vessel, shall be used. Gauges shall be arranged so that the visible length is in excess of the maximum operating range.

Displacement / float type instruments and switches shall be mounted in external cages with flanged connections, rating same as the vessel. This type of instrument shall not be used for applications involving viscous, corrosive or flashing liquids. The cage material shall be carbon steel in accordance with vessel material and the float shall be of 316 SS. Drain and vent shall be provided on the cage.

CONTROL VALVES

Pneumatic control valves complete with microprocessor based electopneumatic positioners.The control valve sizing shall be done in such a way that the calculated noise level at worst operating condition shall not be more than 85 dBA at 1m distance.

Valve trim material shall be harder than, but compatible with, the pipe in which it is installed.

All control valves shall have sufficient overload range. At maximum operation, the control valves shall be at 75-80% open. Valve bodies shall be no more than two (2) line sizes smaller than the pipe in which they are installed.

Leakage class ANSI IV

All control valves (independent of their type) shall have a tight shutoff against at least 110% of the maximum design pressure. The stroke/throughput characteristic shall, dependent on the purpose. The valve stems shall be well guided and the valves shall operate without excessive vibration and noise. The above shall

achieve a stable fluid control over the entire flow range. Control valve design and location shall take into account flashing and cavitation conditions.

In case of failure of electric or pneumatic supply or in case of failure of the controller output signal, the actuators shall remain locked in actual position or shall reach a safe position, depending on the particular case.

Digital valve positioners shall be suitable for two way digital communication based on Fieldbus technology, this shall ensure real time notification of current and potential valve and instrument problems.

WEIGHING SYSTEMS FOR BATCH WEIGHER HOPPERS:

Weighing system shall be new generation weight transmitter providing highest performance and most sophisticated functionality

Technical Specification :

Load cell - IP68, Hermetically sealed.

Type - Compression / Shear beam type.

Construction - SS, with self alignment type integral jacking arrangement.

Installation: Without dummy load cell & tie rods, minimum 4 load cells / hopper.

Indicator:

Six digit display.

24 bit A/D converter.

SS field mounted junction box with IP67 protection. Auto diagnostics.

Suitable for digital communication with the DCS.

G) MISCELLANEOUS

1. GRAVITY SPOUTING

These are used in feed plants for connecting different machines, hoppers, etc. for conveying various ingredients and finished feed.

MINIMUM SIZE OF ANY PIPE TO BE 200 MM. (NOMINAL DIA.).

All pipes, pipe accessories such as bends, spout branches, segments, elbows, transition pieces, flaps etc. to be manufactured from minimum 2 mm thick sheet steel. Pipes & accessories to have non-porous surface having excellent protection against rust.

COMPRESSED AIR PIPING AND VALVES

Air filter cum moisture separator is required to remove moisture, oil fog lubricator for lubricating and pressure regulator to regulate the pressure. GI/MS pipe, only welded or flanged installation, complete with SS ball valve, flexible metal braided hoses & brass nipples, 4 port, 3 way solenoid valves etc as per requirement. Air flow meter shall be installed on the main air delivery line and shall give feed back to control system.

H) TECHNICAL SPECIFICATIONS FOR ELECTRICALS

All electrical load values given are indicative and the system shall be supplied for actual values only.

Under the scope of supply and Works the Entire electrical shall be in the scope of this tender including the street lighting(if required for the proposed new area under automation), internal electrification and wiring.

I). Instrumentation:

VCB shall be provided with microprocessor based protection relay.

General Specifications:

Applicable Standards as detailed in Section I Part – IV Special Conditions of Contract

for ElectricalWorks

All the major components of an MCC shall be of same "Make".

Hoever, for some specific ítems the general specifications are as under

Feeder Details

To be worked out by the bidder as per the design and requirement of the plant.

In addition to the connected load to MCC, at least 15 % (KW rating) spare outgoing feeders complete with starters shall be provided. These spare feeders shall cover as far as possible more or less all sizes of starters. One 63 A, TPN switch fuse unit to be provided for connecting welding set. One additionally 200 A, TPN switch fuse unit to be provided for supplying power to Silo System.

GEARED MOTOR

FUNCTIONAL REQUIREMENTS

For driving various slow speed machines.

DESIGN REQUIREMENTS

The geared motor should use helical gears. The electric motor and helical gear box should be built as one unit.
The geared motors should be suitable for minimum 15 start/stops per hour without undue heating, for continuous duty of at least 24 Hrs. and minimum safety factor of 1.4.
All motors supplied shall be energy efficient type.
The electric motors used for geared motors should be TEFC, degree of protection IP-54, squirrel cage, induction type, with class `B' insulation suitable for 415 V,
50 Hz, 3 phase AC supply. Electric motors performance in general should confirm to IS-325-1978.

SCOPE OF SUPPLY

Geared motors complete as per design requirements specified in 2.0. Each geared motor to be provided with key in the driven shaft, oil level indicator, oil filling plug, oil breather and drain plug.
Suitable grade gear oil for first charge of geared motor. Gear oil should not be filled in the geared motor but should be packed separately in a drum and sent along with geared motor. Gear oil would be filled at site.

J). ELECTRIC MOTORS

FUNCTIONAL REQUIREMENTS

For driving various machines of the plant.

DESIGN REQUIREMENTS

The motors should be TEFC (Totally Enclosed Fan Cooled), squirrel cage, degree of protection IP-54, horizontal foot mounted, induction type, rated for continuous duty, suitable for operation on 415 volts (+ 5%), 50 Hz, 3 phase AC supply.
All motors to have at least class 'B' insulation.
The performance of the motors should conform to Indian Standard IS-325- 1978 amended till date.
The starting torque of the motors shall be at least 2.5 times of the rated torque.

All The motors should be efficiency 1 motors.

SCOPE OF SUPPLY

All electric motors complete in all respects meeting above design requirements. Each motor to be provided with key in driving shaft, direction of rotation marking, name plate etc.

REMARKS

All motors above 25 HP shall be provided bigger terminal box to accommodate Al. cables.

Thermistor to be provided in windings of 60 HP & above motors. The thermistors shall be of two ranges, one being for the warning and the other for tripping the motor if the fault persists.

K). . **FOR TECHNICAL SPECIFICATION OF NEW PRODUCTION BLOCK AREA R PROPOSED UNDER AUTOMATION AND OTHER AREA INTERNAL ELECTRIFICATION AND LIGHTING.**

Lighting of new production block is to be carried out by the bidder. While designing the lighting system the energy saving measures should be taken into consideration. Lighting to be carried out as per the requirement**.** The lighting installation to be wired via a centralised lighting distribution panel in the control room. Various apparatus such as miniature circuit breakers & earth leakage circuit breakers etc. shall be integrated in this distribution panel.

Light fittings control may be individual or group depending upon the locations by switches or miniature circuit breakers. For wiring only Aluminium conductor, PVC insulated armoured cable shall be used for sub-main wiring upto control box in each floor and from each control box to individual fixtures, Al. point wiring in 25 mm MS conduit to be provided. Light fitting to be fluorescent type. Portable emergency lights for indication of the emergency exits to be provided complete with battery and charger. For production block roof, twin obstructers marking light for aviation purpose to be provided.

On each floor which ever of the production block, at least one 25A universal single phase metallic plug and socket power point in Al. die cast dust proof enclosure and one Emergency push button station RED mushroom type in Al. die cast dust proof enclosure to be provided which should be capable of tripping the main incomer in the plant room MCC during an emergency. Suitable lightning arrestor and lightning conductor with connected earthing strip and earthing pits to be provided for lightning protection of the plant

Complete internal electrification of the production block shall be in the scope of the bidder. The lights shall emit lumens suitable to enlighten the entire production block area. Also laying of cables, lighting panel

for internal electrification lighting, etc shall be in the scope of the bidder.

POWER CABLES (LT)

Power cables for use on 415 V system shall be of 1100 V grade, Aluminium conductor, PVC insulated, PVC sheathed, armoured and overall PVC sheathed, strictly as per IS:1554 (Part I) - 1976, read with latest revisions, if any.

The size of these cables shall be as per approved erection drawings. NO CABLE OF SIZE LESS THAN 4 SQ.MM. SHALL BE USED.

CONTROL CABLES

Control cables for use on 415/230 V systems shall be of 1100 V grade, copper conductor, PVC insulated, PVC sheathed, armoured and overall PVC sheathed, strictly as per IS: 1554 (Part I) - 1976, read with latest revisions, if any.

The size of these cables shall be as per approved erection drawings. NO CABLE OF SIZE LESS THAN 2.5 SQ.MM. SHALL BE USED.

OTHER ELECTRICAL ITEMS(where ever applicable for proposed automation)

a) Control circuit junction boxes
b) Cable trays and GI conduits
c) LT Control wires and cables for instrumentation, and interlock along with sensors probes, limit switches, HG switch etc
d) Cable glands, lugs, route markers
e) Earth pits with electrodes
h) Complete double earthing for all electrical equipment with suitable size earth conductors.
i) LT Power Capacitors for PF correction.
j) Rubber mats, fuse puller, hand gloves

The specifications of the above items are available in the Special conditions of Electricals.

L). TECHNICAL SPECIFICATIONS OF PRODUCTION BLOCK HOUSING PROPOSED UNDER AUTOMATION.

This is required to house for proposed new equipment equipment in production block except for exclusions mentioned in the bidding document elsewhere. The housing shall be of steel structure.

It shall be bolted/welded type consisting of suitable, columns, `I' beams, channels, angles, plates, foundation bolts etc. All floors shall be of chequered plates.

Providing, Fabrication & Erecting in position Structural steel sections confirming to IS:806:1968 and IS:1161:1979 or latest for the work of sheds, canopy, space frame, industrial buildings, Railing and Stair, insert plates & angle For RCC work including necessary RHS & SHS of TATA, rolled joists, channels, angles and angle cleats, gusset plates, chequred plate, position hips and jack lifters, purlins, etc. including cutting and welding the members as per detailed drawinganddesign. The scope shall include sand blasting of the steel sections, plates, 2 coat of zinc chromate yellow oxide primer and 2 coats of synthetic enamel paint of approved make over all the surfaces of the steel sections. Shop drawings for the connection details shall be prepared for the approval of the JDS. Gusset plates, Corner plates, joining plates etc. will be profiled and the rate of the profilecuttingshallbe including in the rate quoted. at all levels and all heights, as directedbyEngineer in charge, etc complete. Providing and fixing M S foundation volts Ianchorboltas per drawing and shuttering requirements, as per drawing andasdirectedbythe Engineer In Charge.

PART B - ERECTION, TESTING AND COMMISSIONING (GENERAL)

(SHALL BE APPLICABLE ONLY THOSE UNDER SCOPE OF WORKS)

TECHNICAL SPECIFICATIONS FOR ERECTION, TESTING AND COMMISSIONING.

Erection, testing and commissioning is inclusive but not limited to the following:

- Positioning of all the feed plant equipment in the approved locations, including grouting, anchoring etc as per requirement and as specified in the Special conditions of contract - Mechanical.
- Laying of product, aspiration and Service pipelines inclusive of the necessary valves, fittings etc including the necessary accessories if any.
- Anchoring of the pipe lines on necessary supports for all product, aspiration and Service pipelines.

- Erection/Welding/Grouting into place necessary structural platforms, walkways, hand rails etc., as per requirement.
- Laying of LT Power cables in GI conduit pipes, Cable trays, underground (including excavation etc as per specifications or in trenches provided by the purchaser, including the anchoring of cable trays/conduits, isolators, junction
boxes, remote push button stations, capacitor banks etc.
- Termination of Power cables on MCC and on Motor starters, Capacitors, isolators with suitable cable glands, lugs etc. including the drawing & termination through flexible conduits, the flexible copper conductors between motor and isolators/junction boxes.
- Termination of control cables/sensor wires on RCPs, control panels, limit switches, indicators, controllers etc
- Earthpit installation complete including excavation, installation, refilling etc.
- Earthing of all electrical equipment with two runs of earth electrode of appropriate size from earthpits, Panel board trenches etc
- Approval of Electrical installation executed by the bidder by the Electrical Inspectorate. Necessary statutory fees will be reimbursed on production of stamped receipt.

NOTE

1. The bidder has to take note of the Special conditions of contract - Mechanical,Electrical and erection which gives in detail the specifications for painting, cable laying/handling as also the details of the Earthing network.
2. Welding: All weld joints for fabricated items should be ground smooth from inside to facilitate easy and free flow of material.
3. Painting procedure:

Painting procedure for all the items of the supplier shall be as follows:

a) Removal of the rust from surfaces by using sandblasting/emery paper/chemical rust solvent etc.
b) Apply two coats suitable Zinc chromate red oxide primer.
c) Putty should not be used to hide the dented surfaces/imperfections and instead dents if any should be removed carefully.

d) Apply two coats of approved shade of synthetic enamel/black bituminous paint. Shade shall be approved by purchaser.

5.0 MAKES OF ITEMS TO BE SUBMITTED BY BIDDER

Bidder shall provide makes of mejor ítems under scope of supply& all other equipment/bought out items, etc

Bidder shall provide brochures of the mejor equipment as supporting documents.

6.0. BATTERY LIMITS/EXCLUSIONS

BATTERY LIMITS

6.1 Electrical

Scope of the bidder starts from the existing LT panel providing required out going feeder switch fuse units /MCCB to the MCCs to be provided by the bidder in the plant for the equipment/motors under scope of supply, control room including laying of cables, termination with glands and lugs at both ends. Two or more MCCs instead of a single MCC should be provided by supplier. All power & control cabling including MCC, earthing pits for MCC & computers, earthing electrode, flats, wires etc., is in the bidder's scope. Instrument and power earthing both are in the scope of bidder. Internal electrification of production block and lighting shall be in the scope of the bidder.

However Bidder shall provide load details to work out provisión in existing available load or if required for enhencement.

6.2 Steam

Already available.

6.3. Compressed Air

Bidder to connect pipe line from nearest point available in production block for the requirement of proposed work.

6.4. Lighting

Complete lighting from the main panel for the entire production block plant (working & storage) shall be in the bidder scope. Other building lighting such as Godowns, Street light, administration building and service buildings shall be in purchasers scope.

6.5. Housing Structure

Production block foundation and all RCC works including columns upto plinth shall be provided by the Purchaser. Above plinth level all structure is in bidders scope for proposed automation of batching system in production block.

6.6. Exclusions

1. All Civil works except where specifically mentioned in the tender.
2. Sanitary Installation, Water Disposal.
3. Environmental Works, Access Roads.
4. Telephone & Intercom System.

7.0. Testing & Commissioning of proposed automation work.

After completion of erection and connection of all services , the plant shall be operated by the Supplier without raw materials, equipment wise or section wise to make final testing, adjustments & modifications. Once this is completed, proposed section under automation shall be run with materials for testing, adjustment and modifications, to demonstrate rated capacities of the particular section for minimum one week / or as proposed by the purchaser on a single shift of 8 hours basis and then for 1 weeks to show the rated output of of CFP for the proposed automation of batch mixing. More than one section can be run in a shift. After this, if the Supplier is ready for production trial, the complete plant shall be run for total 20 hours (3 shifts a day) to establish the capacity of the proposed section under automation and synchronization with complete plant. If during these trialruns, shut-down occurs for more than 2 hours in a shift, due to external force majors reasons, trials shall be abandoned for that shift and repeated. During these trials though the production and maintenance staff shall be provided by the Purchaser/Client, the responsibility of plant operation to achieve the guar anteed performance remains with the Supplier.

8.0 DEVIATIONS FROM TECHNICAL REQUIREMENT

This bidding document provides scope of supply/Works/drawings of existing plant layout/proposed extensión of civil building for the automation of Batch mixing system to be used for the cattle feed plant and the 'Design data and Design basis'and ' Technical Specifications' define the qualitative parameters and frame work against which equipment will be required to perform.

It is incumbent on bidders to provide the fully detailed technical specification of the equipment and services which they intend to provide to fully execute the contract in line with the tender document.

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

This bidding document does not allow bidders to make exclusions from any part of the bid and an incomplete list of equipment or an incomplete schedule of service utilities to be provided would be considered as a non-responsive bid.

However in case of any additional/ extra ítems which shall be included in under extra ítems column in Price bid and the details of the shall be submitted with technical specifications in technical bid.

9.0 OPTIONAL ITEMS:

All items mentioned in the bidding document as "optional" items shall be quoted. There may also be items or sections offered as 'OPTIONAL' by the bidder.
The proposed automation of Batch mixing system shall be designed with all provisions to include the optional items in such a way that no major changes would be required in the system. The specifications of 'Optional' items shall be the same as that of similar ítems in the tender.

The cost of 'Optional' items shall not be included in the calculation of total bid price but will be used in the overall commercial evaluation of the bid. In the event that the optional items are selected by the purchaser for supply, the quoted price for the "optional" item shall include all incidental costs of installing that item as part of the contract. No extra charge shall be payable on any account.

10.0. Break up price

The scope of supply/items are detailed in the bidding document for which break up Price as per ítem wise are required, in case of ítems under lots where ever applicable rates are to be provided in RM or Sq mt, Kgs or MT . Although the bidding document will be evaluated on a lump sum basis those ítems under lots which may increase or decrease during the execution of the project based on the actual site conditions and hence the quantity may vary. The unit rates given will then be applicable for such items and nothing extra will be paid. The break-up of LOT items with item wise unit rates is to be given with bid.

However the same will also be clearified in work order to the successful Bidder.

11.0 MAJOR RESPONSIBILITIES OF BIDDER

Performance tests should be carried out by the bidder in the presence of and to the satisfaction of Purchaser/Client's incharge.

Execution of the project in accordance with the prevailing Indian Standards, Indian Electricity Rules, Indian Explosives Act, Indian Factories Act, Indian Pollution Act and any other Acts.WhereverIndianStandards are not available the bidder shall follow International Standards.

Arranging for approvals from various statutory authorities on behalf of the Client / Purchaser. The statutory fees shall be reimbursed by the Client/Purchaser on production of receipts.

Ensuring satisfactory performance and After-Sales service of 'Bought-Out' items included in the scope of supply.

First charge of oil, lubricants and consumables. "First charge" means that these items shall be replenished whenever and wherever required till the successful completion of product trials.

Test kits required for establishing performance parameters. Necessary manpower and tools.

Performance guarantees with regard to the following:

a) Rated performance of individual equipment and complete system(s).

b) Product quality standards conforming to the prevailing Standards.

c) Consumption of utilities for individual equipment and for the complete system.

The responsibilities of Purchaser/Client are described under "PROJECT MANAGEMENT", Section-12.0

12.0. PROJECT MANAGEMENT:

The project execution shall be time- bound as per the mutually agreed time schedule. A competent execution team shall be deputed at site and shall be headed by a Project Engineer who shall be stationed at site. The Project Engineer shall be responsible for overall implementation of the entire project, from commencement to the final take over of the plant.

The services of the Project Engineer shall be ensured for the day to day operations and coordination to ensure successful and satisfactory design, procurement, manufacture, inspection, erection, testing and commissioning of all the equipment / facilities/ systems within the time-bound schedule. He may be assisted by a Site Engineer to take care of all site activities.

The Project Engineer and Site Engineer shall attend all technical and review meetings between various parties involved in the project and ensure implementation of all decisions taken in the meetings.

The purchaser shall nominate a Project Incharge with whom the supplier shall communicate/ coordinate.

Approval on technical documentation (with or without specified amendments) shall be given by Client within ten working days after submission. The amendments which are not in the original scope of work or due to changes in concept, shall be taken up by the supplier as per mutually agreed rates (decided either before of after execution), 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 the same equipment are mentioned in the form of alternatives, the supplier shall seek approval for choosing one make over another.

The Project Manager shall be responsible for detailed material accounting at site and management of the store maintained at site.

All the detailed design calculations regarding the selection of equipment sizes, system types, etc shall be submitted to Purchaser/Client for

their specific observation and record. The Project Manager will provide the Client Project incharge with monthly progress reports which clearly indicate the actual Vs planned progress and the new likely completion data of erection and commissioning.

For Equipment/items, the supplier shall invite Purchaser/Client for inspection and preliminary testing. The inspection may be required at various stages of manufacture/ assembly for some items.. Details of documentation to

be submitted shall be according to the overall project programme. The Project Manager shall be fully authorised to take on the spot decision with regard to :-

a) Modification in layout and execution programme to suit local conditions.

b) To purchase essential materials from local market to avoid delays.

For smooth execution of the project, a team of Project Manager , Site Engineer and Key Personnel shall remain consistent throughout the execution period.

After satisfactory erection and testing, competent commissioning team shall be deputed to establish the performance parameters for a specific period.

Staff pattern shall be submitted along with the offer to meet the execution time schedule.

13. TESTING AND COMMISSIONING

On completion of the bidder's testing and commissioning period, which shall be as per the clause, the plant has to be operated at full capacity continuously in 3 shifts of 8 hours/as proposed by purchaser basis for two days to the satisfaction of the Purchaser/Client incharge.

14. TRAINING:

Training in the use of the various process equipment in the plant shall form an important component of Project Management. Training shall be undertaken by the bidder for a period of six weeks during which the contractor should guide and train the staff of the client in operating the plant equipment to achieve the optimum plant efficiency and product quality. Training should commence during the commissioning period and include:

1. Familiarization with major equipment of the scope of supply for automation of batch mixing and related operations including the operation of the computer based auto batch weigher.
2. Procedure for attaining the rated output and optimum product quality.
3. Familiarization with the basic principles of Electronic/Electrical control systems, if any including fault finding.
4. Familiarization with start-up procedures, regular maintenance and operational procedures including dismantling of machine parts, replacement of spares/ components, preventive maintenance etc as per the scope.
5. Condition monitoring of equipments.

Training shall be given to all the personnel required to operate the plant, and their immediate Supervisors /Engineers.

The training schedule should be proposed by the bidder together with the content of training programmes, their duration etc.

STAND-BY AFTER COMMISSIONING

Once the commissioning and warranty runs are over, the supplier shall provide to the plant standby technical supervisory support as follows

- For one month after warranty runs in which further training of the Purchaser/Client's operating staff if required shall be done and equipment/system still needing finer adjustment/changes shall be carried out.
- For a week each after 4 months, 8 months and 1 year from warranty runs, to have discussions with plant staff, to review the correctness of operations & maintenance procedures.
- These visits of the Supplier other than those covered under guarantee clause, which shall be undertaken whenever

required separate.

The Client/Purchaser shall provide :

- Temporary store at site .
- Details of civil design, building layout and drainage and sewage details.
- Document on local site conditions related to climate and communications.
- Adequate labour force with supervisors and engineers for trial, testing and commissioning shall be provided at no charge by Client.
- Temporary water and power supply at one mutually agreed point within the site. The power shall be on chargable basis.
- All buildings including roads, drainage and minus civil works during plant and pipe work installation
- Provision of and cost of services, raw product, packaging material etc.
- Fire fighting system .
- Lighting distribution system where ever required and in non-plant areas.
- Internal telephone system.
- Engineering personnel to liaise with the supplier, Project Manager and the execution team.
- Provision of personnel for training and on going jobs supervision.
- Telephone facility on chargeable basis.
- Permanent water and power supply at the time of commissioning of the plant.

In order to ensure that the efficiency of the plant is maintained at an optimum level, a proposal to offer a service coverage for a period of two years from the date of plant acceptance may be given by the supplier for the maintenance of the Auto Batch weigher and Electronic Bagging-off Weigher.

The objectives of this coverage shall be:-

- To arrange for regular service visits by the supplier of these equipments to inspect, service and carry out repairs if necessary and when ever there is a breakdown/failure of the system. The frequency and duration of the visits may be clearly specified.

15.0 LIST OF DRAWINGS AND DOCUMENTS:

15.1 Following drawings are enclosed along with the tender:

a) Existing plant layout showing machinery layout, Production plant area, RMG and FPG.

b)- Drawing showing extensión of civil building for the proposed work of automation of batch mixing and capacity enhencement for raw materials/ Finished godowns.

15.2 The following drawings shall be enclosed with the offer by the bidder

a) Machinery layout (plan) for the proposed automation of batch mixing plant/equipment for the existing cattle feed plant, floor wise including the sectional elevations for new scope of supply, showing the major equipment/feed piping. The drawing should also show staircase, platforms, walkways, ladders etc. and other details.

b) Product flow diagram including production equipment, service and production piping for the proposed work.

c) Layout of foundation proposed by the bidder giving load details at each column as also the floor wise load details for the proposed work.

d) Service and utilities piping schematic including interconnecting piping, controls, instruments, automation (if any), etc where ever required.

e) Single line diagram indicating Horse Powers for electrical distribution system. Cable trays/floor conduit routes and trench locations. Schematic for interlocking of equipment section wise.

f) The bid shall include general arrangement drawings for the individual equipment along with equipment specifications.

NOTE:

Bidders may note that if successful, fabrication drawings of all equipment irrespective of whether stated separately or not shall be got approved by Client before fabrication.

15.3 Charts shall be enclosed with the offer by the Bidder

The following charts shall be enclosed along with the offer by all the Bidders:

(where ever applicable)

a) Plant utilization chart for services(HISTOGRAMS).

b) Electrical Load diagram for on 24 hours basis.

c) Bar chart for Project execution including personnel training programme.

e) PERT chart.

15.4 Service consumption schedules for connected average and peak loads for all the equipments shall be enclosed with the offer by the bidder

The services to be considered are :-

Perticulars of service	consumption with unit
a)	
b)	
c)	

15.5. Following details shall be enclosed with the offer by the bidder

1.0 Literature covering general and technical information for all equipment covered within the scope of the tender including relevant pages of operation and maintenance manuals.

2.0. Detailed calculations for selection of process and utility equipment based on utility consumption and process requirements.

3.0. List of spare parts with quantity, to be quoted on two years inventory basis along with price break-up.

4.0. Any other equipment/item which is not mentioned above but is required as per description in the text shall also be provided.

5.0. Any other equipment/item that the Bidder feels is necessary shall also be provided.

7.0. All makes purchased by bidder if successful shall be approved by client first and then only procurement of such items shall be done.

16.0 PERFORMANCE GUARANTEES

If the plant or any part there of does not give the agreed process performance and consumption guarantees during the warranty period due to reasons attributable to the supplier, the action shall be taken by the Purchaser with respect to the PBG submitted by the vendor.

17.0 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 into account the following factors.

(a) Suitability of the process with regard to ultimate product quality conforming to the standards specified in this section of the tender.

(b) Specifications of individual equipments as well as the system as a whole for material of construction, throughput, operating parameters, level of automation, extra features, latest design, ease of maintenance etc.

(c) Energy efficiency of individual equipment and system as a whole.

(d) Completeness of submitted bid with respect to all information, data, details and documents asked for.

18- Forms-
Bidder's detail,
Conteract-Agreement,
Bank Guarantee forms
Performance-Security.

(01)

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
   :……..
4. Name with Designation of other persons :……..
   authorized to sign the documents on behalf:……..
   of the Unit if anyway
   :……..
5. Telephone /Fax No. …….
   Office…….…… Factory……..….
6. Telegraphic Address ……..……..
   Office……..…… Factory ……
7. Particulars of the Registration certificate issued by the Directorate of Industries ……
   Registration No. & Date……..…….
8. 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

13. Customers on current list : (separate sheet may be attached)

:……..
14. If you Propose to Diversify to Technological advancement if so, What is the expected time
……
15. Name & address of service canters/engineers

16. No. of EQUIPMENTs supplied to coop. milk unions in last 5 years (separate sheet may be attached)
……
……..……..…….……

17. Annual turnover of the firm from EQUIPMENT segment (attach proof) ……

18. Whether the EQUIPMENTs are being manufactured in India

……..….

19. 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)

(02)

CONTRACT AGREEMENT FORM

(Refere clause 20(III) of General Terms and Conditions)

(On a Non-Judicial Stamp Paper of Rs.500.00)

THIS AGREEMENT is made at Jabalpur on the_____ day of _____ 20 between Chief Executive Officer, Jabalpur Sahakari Dugdha Sangh Maryadit, Jabalpur,MP, India (hereinafter called "JDS")oftheonepartand _____(hereinafter called "the Contractor") of the other part.

WHEREAS JDS has appointed Supplier/Contractor to get work done under the contract of the bid which has been submitted bySupplier/ Contractor and who has accepted a bid in response to the JDS' Bidding Document Reference _____ with regards to undertaking of the Mechanical & Electrical work, for a sum of Rs. _____ (Rupees ……..) (here in after called "the Contract Price").

NOW THIS AGREEMENT WITNESSTH AS FOLLOWS:

1. 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.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz

   a. 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:

   C. The General terms and conditions, special conditions of erection and commissioning inrespective Sections in the above referred Bidding Document:

   d. The JDS Work Order No. _____ dated _____ (Fileref.:)

3. In consideration of the payments to be made by the JDS to the Contractor, theContractor hereby covenants with the JDS 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 here to have caused this agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, Sealed and Delivered the said

Authorized Signatory Authorized Signatory

Chief Executive Officer, Jabalpur
ContractorSahakari Dugdha Sangh Maryadit, Jabalpur,MP, India

In the presence of: In the presence of:

Witness	Witness
1) Signature	1) Signature
Name Address	Name Address
2) Signature Name Address	2) Signature Name Address

(03)

(Form of Bank Guarantee for Performance Security)

(Refere clause 21-A(c) 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, Jabalpur Sahakari Dugdha Sangh Maryadit, Jabalpur,MP, India_**(hereinafter referred to as "JDS") which expression shall unless repugnant to the context and meaning thereof include its legal representative, successors and assignees.

Whereas, JDS 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 JDS 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 JDS 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 thereunder and we further undertake and guarantee to make payment to the JDS 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 thereunder.

In case, the Supplier fails to perform or fulfill the Contract/ Purchase Order as pertheterms and conditions agreed upon, the JDS 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 JDS itself will be conclusive evidence and proofthatthe Supplier has failed to perform or fulfill his obligations and neither the Supplier nor the Bankwill be entitled to raise any dispute regarding the reasons for the failure of performance or fulfillment, on any ground.

We, _____ (name of the Bank), do hereby undertake to pay an amount equal to Rs._____ being the 10% of the order value, being the amount due and payable under this guarantee without any demur, merely on a demand from the JDS 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 non-performance of the contractual obligations as aforesaid by the Supplier or by reason of the Supplier's failure to perform the said contractual commitments/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. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____ (Rupees_____ _____ only) being the amount equal to 10% of the total order value.

We, _____(name of the Bank), further, agree that the performance guarantee herein contained shall remain in full force and effect for a period of _____ calendar months from the date of Bank guarantee (the period should be till end of warranty period) and till the 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 and accordingly discharge the guarantee, unless a demand or claim under this guarantee is made on us in writing by the JDS on or before _____, we shall be discharged from all liabilities under this performance guarantee thereafter.

We, _____(name of the Bank), further agree with the JDS that the JDS shall have the fullest liberty without our consent and without affecting in any manner our obligations here under to vary any of the terms and conditions of the said Bidding Document and the Contract/Purchase order or to extend the time of performance by the said Supplier from time to time or postpone for any time or from time to time and any of the power exercisable by the JDS against the Supplier and to forebear or enforce any of the terms and conditions relating to the said Bidding Document and the Contract/Purchase Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Supplier, or for any forbearance, act or omission on the part of the JDS to the said Supplier 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.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the JDS may have or hereafter possess in respect of the goods supplied/executed or intended to be supplied/executed and the JDS shall be under no obligation to marshal in favour of the Bank any such securities or funds or asset that the JDS may be entitled to receive or have a claim upon and the JDS at its absolute discretion may vary, exchange, renew, modify or refuse to complete to enforce or assign any security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to theJDS 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 Bankeither by actual delivery thereof to the Bank or by despatch thereof to the Bank by Registered Post at the address of the Bank.

In order to give full effect to the provisions of this guarantee the Bank hereby waives all rights inconsistent with the above provisions and which the Bank might otherwise as a guarantor be entitled to claim and enforce.

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

We, _____(the name of Bank), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the JDS in writing and the guarantee shall be a 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 JDS serves upon the Bank a written claim or demand on or before _____.

_____

(SIGNATURE)

Place: SEAL

Date:

CODE NO

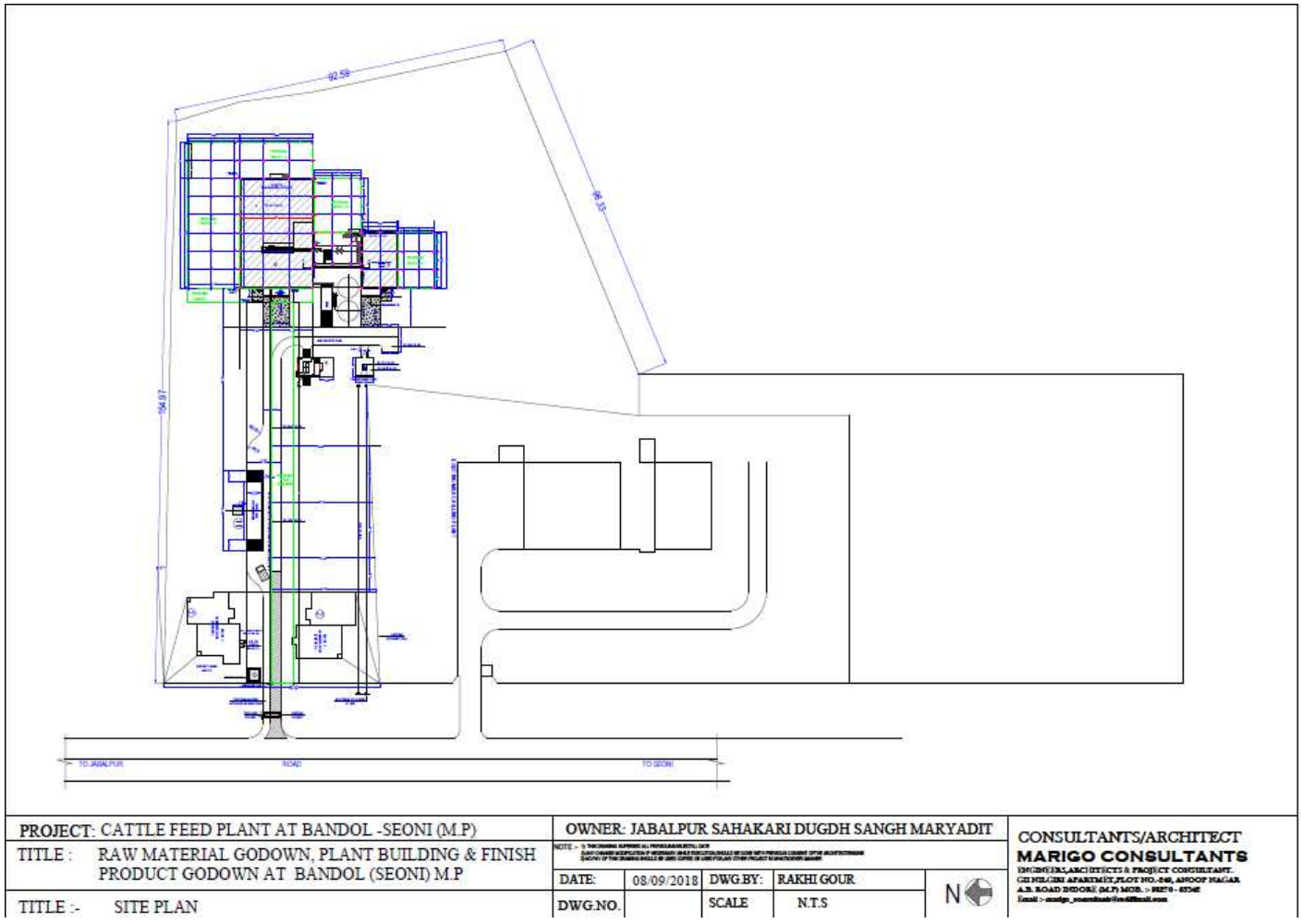
NOTE:

1 THE SUPPLIER SHOULD ENSURE THAT SEAL AND CODE NO. OFTHESIGNATORYISPUTBYTHEBANKERS,BEFORESUBMISSION OF THE BANK GUARANTEES.

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

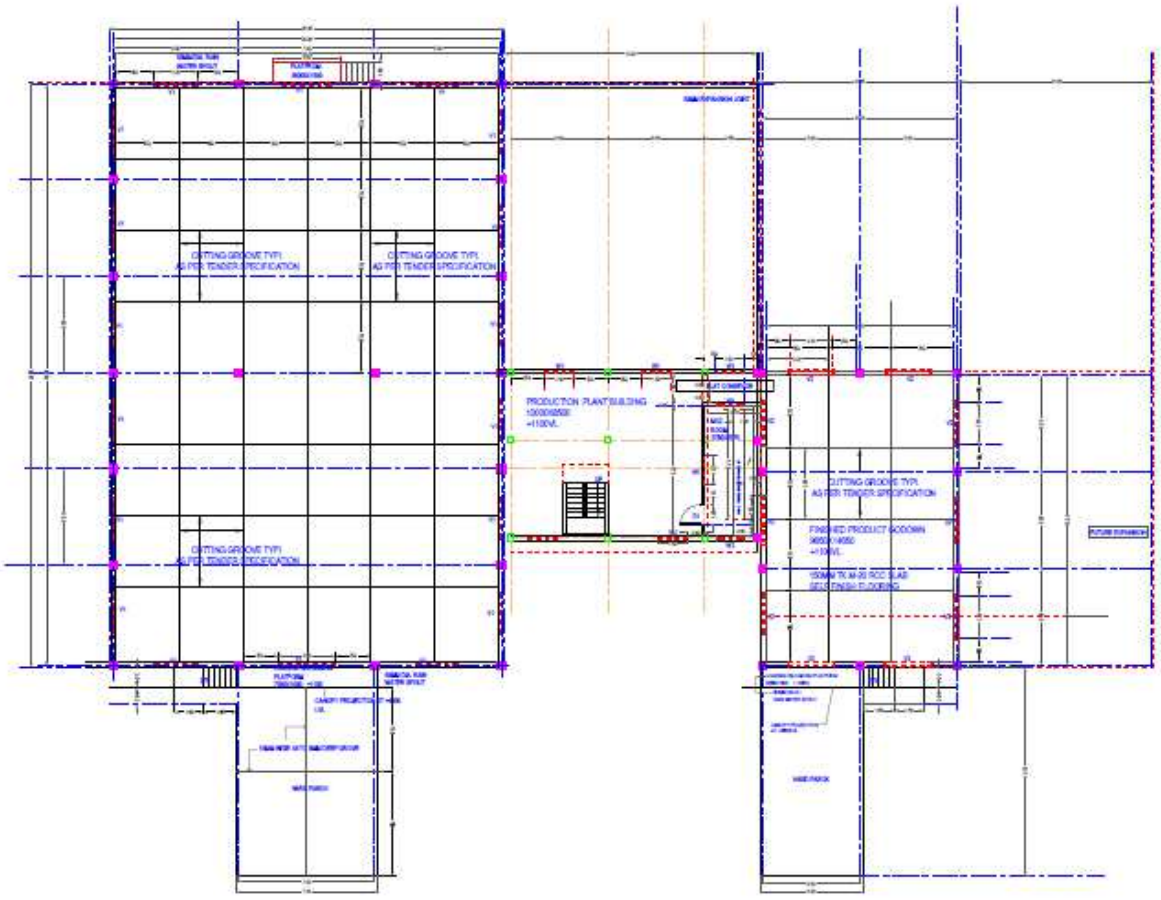
3 THE VALUE OF STAMP DUTY SHOULD BE AS PER THE LATEST STAMPACT OF LOCAL STATE GOVERNMENT FROM WHERE THE BANKGUARANTEE ISSUED.

(19) DRAWINGS



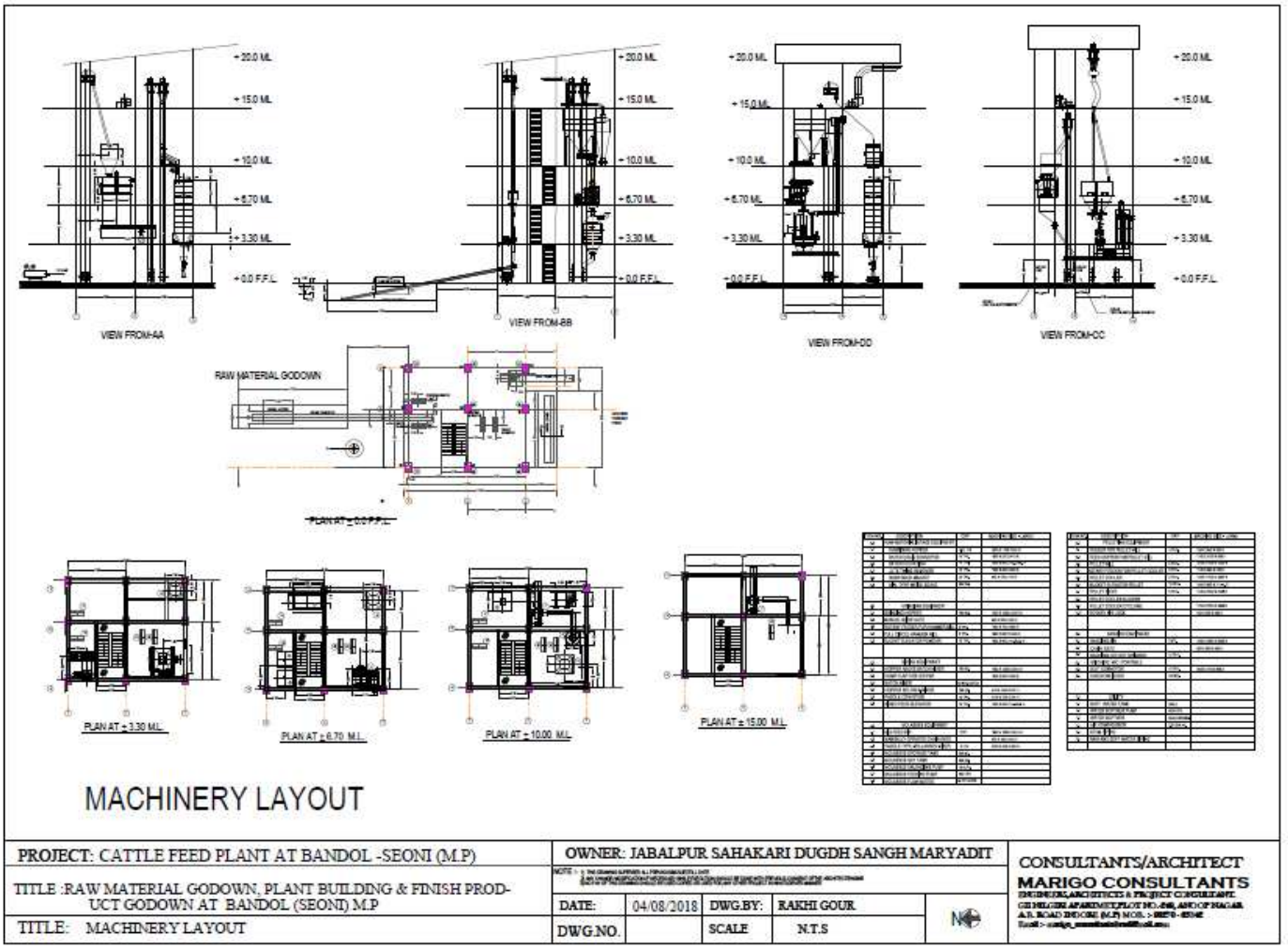
PROJECT: CATTLE FEED PLANT AT BANDOL -SEONI (M.P)		OWNER: JABALPUR SAHAKARI DUGDH SANGH MARYADIT			CONSULTANTS/ARCHITECT **MARIGO CONSULTANTS**
TITLE : RAW MATERIAL GODOWN, PLANT BUILDING & FINISH PRODUCT GODOWN AT BANDOL (SEONI) M.P		DATE:	08/09/2018	DWG.BY: RAKHI GOUR	N
TITLE :- SITE PLAN		DWG.NO.		SCALE N.T.S	

SITE PLAN WITH PEOPOSED EXTENSION IN BLUE COLOUR



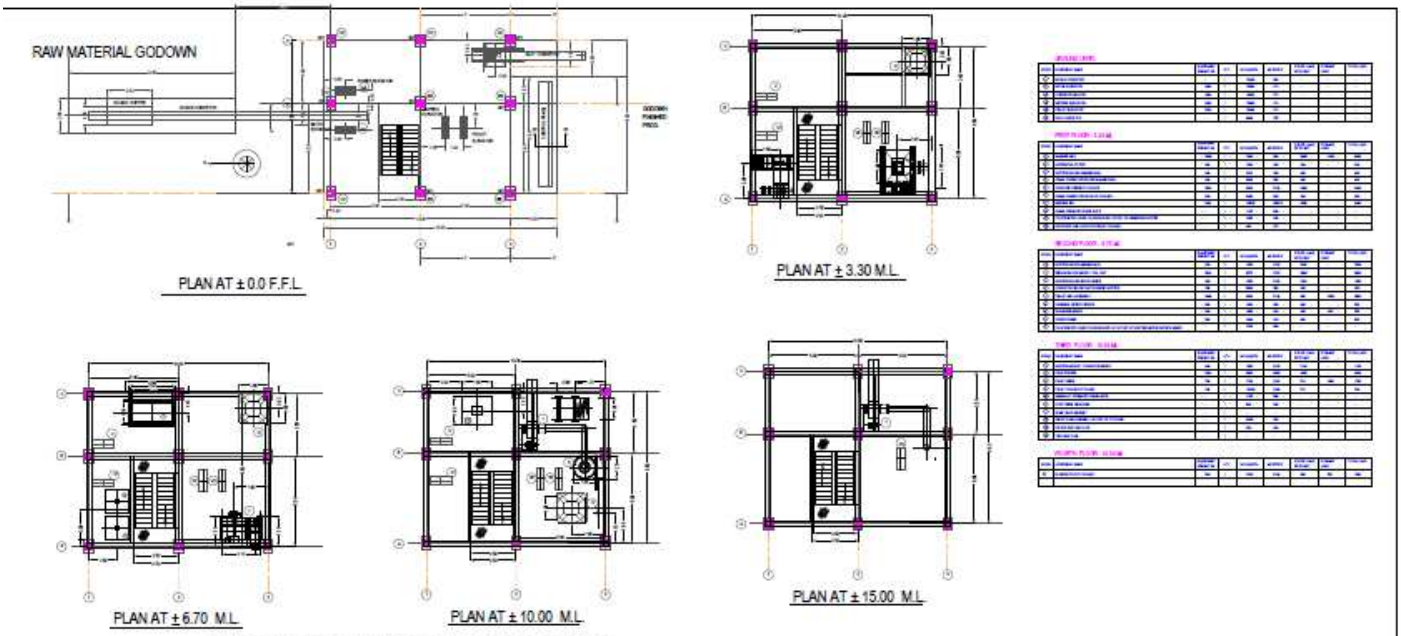
GROUND FLOOR PLAN

PROJECT: CATTLE FEED PLANT AT BANDOL -SEONI (M.P)	OWNER: JABALPUR SAHAKARI DUGDH SANGH MARYADIT				CONSULTANTS/ARCHITECT MARIGO CONSULTANTS
TITLE :RAW MATERIAL GODOWN, PLANT BUILDING & FINISH PRODUCT GODOWN AT BANDOL (SEONI) M.P	DATE:	04/08/2018	DWG.BY:	RAKHI GOUR	
TITLE: ROOF PLAN & + 4400 MM LVL PLAN	DWG.NO.		SCALE	N.T.S	



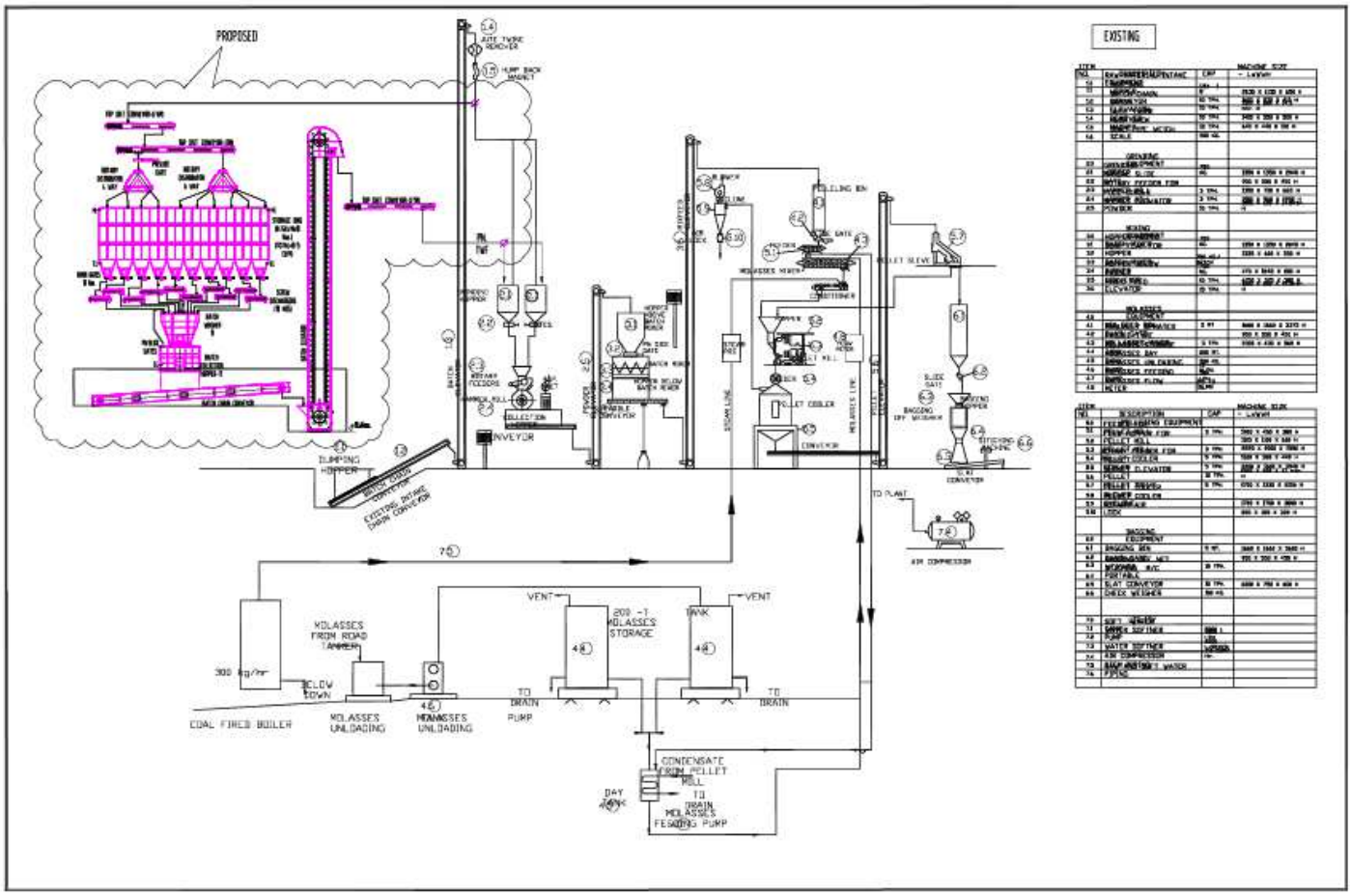
MACHINERY LAYOUT

PROJECT: CATTLE FEED PLANT AT BANDOL -SEONI (M.P)	OWNER: JABALPUR SAHAKARI DUGDH SANGH MARYADIT				CONSULTANTS/ARCHITECT
TITLE :RAW MATERIAL GODOWN, PLANT BUILDING & FINISH PRODUCT GODOWN AT BANDOL (SEONI) M.P		DATE:	04/08/2018	DWG.BY: RAKHI GOUR	MARIGO CONSULTANTS
TITLE: MACHINERY LAYOUT		DWG.NO.		SCALE N.T.S	



MACHINERY LAYOUT LOAD DETAILS

PROJECT: CATTLE FEED PLANT AT BANDOL -SEONI (M.P)	OWNER: JABALPUR SAHAKARI DUGDH SANGH MARYADIT				CONSULTANTS/ARCHITECT MARIGO CONSULTANTS
TITLE :RAW MATERIAL GODOWN, PLANT BUILDING & FINISH PRODUCT GODOWN AT BANDOL (SEONI) M.P					
TITLE: MACHINERY LAYOUT LOAD DETAILS	DATE:	04/08/2018	DWG.BY:	RAKHI GOUR	
	DWG.NO.		SCALE	N.T.S	



PROPOSED EQUIPMENT LAY OUT WITH NEW EQUIPMENT