NATIONAL AGRICULTURAL COOPERATIVE MARKETING FEDERATION OF INDIA LTD.(NAFED)
NAFED House, Siddhartha Enclave
Ashram Chowk, Ring Road
New Delhi-110014

REQUEST FOR QUOTATION (RFQ) FOR EMPANELMENT OF AGENCY/AGENCIES FOR SUPPLY, ERECTION & COMMISSIONING OF HONEY PROCESSING PLANT & AUXIALARY MACHINERY ALONG WITH UTILITY EQUIPMENTS, PIPING & SYSTEMS INCLUDING CIVIL WORKS

1. **RFQ NO. HO/FOF/NBHM/ EPC1-P&M /2021-22**
2. **Dated: 18.08.2021**
3. **Last Date of submission: 24.09.2021**
4. **Pre-Bid Meeting Date: 25.08.2021**

NATIONAL AGRICULTURAL COOP. MAKTG. FED. OF INDIA LTD. (NAFED) NAFED HOUSE,
SIDDHARTHA ENCLAVE
ASHRAM CHOWK, RING ROAD
NEW DELHI-110014
www.nafed-india.com

NOTICE INVITNG TENDER

REQUEST FOR QUOTATION (RFQ) FOR EMPANELMENT OF AGENCY/AGENCIES FOR SUPPLY, ERECTION & COMMISSIONING OF HONEY PROCESSING PLANT & AUXIALIARYMACHINERY ALONG WITH UTILITY EQUIPMENTS, PIPING & SYSTEMS ON TURN-KEY BASIS ON PLOTS OF LAND ALLOTTED BY NAFED AT FIVE LOCATIONS AS PER TECHNICAL SPECIFICATIONS AS MENTIONED IN THE TENDER DOCUMENT AND ANNEXURES.

THE BIDDERS MAY SUBMIT THE REQUEST FOR QUOTATION (RFQ) FOR A SINGLE UNIT OR ALL THE FIVE UNITS AS PER THEIR CAPABILTY, AVAILABLE MANPOWER AND FINANCIAL RESOURCES.

1. Name and address of the

Contractor: .....

Date of issue: .....

2. Issued by.....

3. Received Demand Draft

i. Banker's details:

ii. Cheque No

iii Date.....

iv. Bank & Branch

v. Amount .....

Sr. No.	Description	Target Information
1.	Reference No. of tender document	
	Purpose	To Fabricate, Procure, Supply, Erect and Commission the Honey Processing Plants at Five Locations as defined in the document along with all related Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works on Turn-Key Basis as defined herein the document and annexures attached herewith.
	Title of the Plot	The land shall be arranged by NAFED to each of the Project either by way of Title Transfer or Long Lease
2.	Date of issue/sale of tender document	From 18.08.2021 to 24.09.2021 (upto 11:00 hrs.) from National Agricultural Cooperative Federation of India Ltd., NAFED HOUSE, Siddhartha Enclave, Ashram Chowk, Ring Road, New Delhi 110014 OR from NAFED website www.nafed-india.com
3.	Pre-bid Meeting	25.08.2021 at 13 00 hrs (venue: Nafed, New Delhi)
4.	Last date & time for submission of bids	24.09.2021 up to 1500 hrs
5.	Date & time of opening of technical bids	24.09.2021 at 1600 hrs
6.	Opening of Financial Bids	Will be intimated later to all technically qualified bidders
7.	Earnest Money Deposit (EMD) in the form of a demand draft/banker's cheque.	**2% of the Contract Value** through demand draft/ Banker's cheque drawn in favor of **"NAFED" "** on any scheduled commercial bank payable at New Delhi be enclosed with the technical bid. Contract Value is equivalent to amount submitted in Financial Bid.
8.	Cost of tender document	**Rs.5900/**(Rupees Five Thousand and nine hundred only)(Non- refundable) through a demand draft/ Banker's cheque or NEFT in favour of **"NAFED"** from any scheduled bank, payable at New Delhi.
9.	Contact Person for queries (Strictly between 1430 to 1700 hrs on working days only)	Sh. Unnikrishna Kurup R, GM (FOF) Nafed, New Delhi (Ph No.: 011-26340019) Sh. Vinod Kaul (Mob. : 9650377799)/(9868177799) Sh. Vanish Kumar (Mob. : 9717554935), Project Consultant & Coordinators from Mariental India Pvt. Ltd., New Delhi
10.	Address for Bid Submission	National Agricultural Cooperative Federation of India Ltd., NAFED HOUSE, Siddhartha Enclave, Ashram Chowk, Ring Road, New Delhi 110014
11.	Validity	The bids submitted shall remain valid for a period of 120 days from the date of opening the technical bid.

1. NOTICE OF DISCLAIMER

i. The information contained in this RFQ or subsequently provided to intending Applicant(s) whether verbally or in documentary form by or on behalf of National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) or any of its employees or officers (referred to as "NAFED Representative") is provided on the terms and conditions set out in this RFQ document and all other terms and conditions subject to which such information is provided.

ii. No part of this RFQ and no part of any subsequent correspondence by NAFED, or NAFED Representatives shall be taken neither as providing legal, financial, or other advice nor as establishing a contract or contractual obligations. Contractual obligations would arise only if and when definitive agreements have been approved and executed by the appropriate parties having the authority to enter into and approve such agreements.

iii. The RFQ document has been prepared solely to assist prospective Applicants in making their decision to place their applications against this RFQ. NAFED does not purport this information to be all-inclusive or to contain all the information that a prospective Applicant may need to consider in order to submit an application. The data and any other information wherever provided in this RFQ is only indicative and neither NAFED, nor NAFED Representatives, will make or will be deemed to have made any current or future representation, promise or warranty, express or implied as to the accuracy, reliability or completeness or the information contained herein or in any document or information, whether written or oral, made available to an Applicant, whether or not the aforesaid parties know or should have known of any errors or omissions or were responsible for its inclusion in or omission from this RFQ.

iv. Neither NAFED nor NAFED Representatives make any claim or give any assurance as to the accuracy or completeness of the information provided in this RFQ Document. Interested parties are advised to carry out their own investigations and analysis or any information contained or referred to herein or made available at any stage in the bidding process in relation to this RFQ. Applicants have to undertake their own studies and provide their applications.

v. This RFQ Documents is provided for information purposes only and upon the express understanding that such parties will use it only for the purpose set forth above. It does not purport to be all-inclusive or contain all the information about the proposal in relation to which it is being issued.

vi. The information and statements made in this RFQ document have been made in good faith. Interested parties should rely on their own judgments in participating in the said Project. Any liability is accordingly expressly disclaimed even if any loss or damage is caused by any act or omission on part of the aforesaid, whether negligent or otherwise.

vii. The RFQ Document has not been filed or approved in any jurisdiction. Recipients of this document should inform themselves of and observe any applicable legal requirements. NAFED makes no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of the RFQ Document.

viii. NAFED reserves the right to reject all or any of the Applications submitted in response to this RFQ at any stage without assigning any reasons whatsoever.

ix. All Applicants are responsible for all costs incurred by them when evaluating and responding to this document and any other costs incurred by the applicant thereafter.

x. NAFED may at its sole discretion proceed in the matter it deems appropriate which may include deviation from its expected evaluation process, the waiver of any documents and the request for additional information.

xi. Unsuccessful Applicants will have no claim whatsoever against neither NAFED nor its employees, officers.

xii. NAFED reserves the right to modify, suspend, change or supplement this RFQ atany stage. Any change to the RFQ will be notified on NAFED website by way of corrigendum.

xiii. Mere submission of an application does not ensure selection of the Applicant as Successful Applicant or applicant.

xiv. National Agricultural Cooperative Marketing Federation of India Ltd., an apex level Cooperative Marketing Organization, registered under the relevant provisions of the Multi State Cooperative Societies Act, 2002 (as amended up-to-date), having its Head Office at NAFED House, Siddhartha Enclave, Ashram Chowk, New Delhi-110014, (hereinafter referred to as the "NAFED").

INTRODUCTION AND OVERVIEW

1. INTRODUCTION

National Agricultural Cooperative Marketing Federation of India Limited (NAFED) is an apex organization of marketing cooperatives in India. NAFED is also one of the central nodal agencies for procurement of notified agricultural commodities like onion, apple, potato and other perishable horticulture crops under Price Support Scheme (PSS) and Market Intervention Scheme (MIS). NAFED is also procuring Pulses for Buffer Stocking under Price Stabilization Fund (PSF) Scheme of Government of India.

2. OVERVIEW

a. Keeping in view the importance of beekeeping and to achieve the goal of "Sweet Revolution" the need for a holistic development of beekeeping was felt. Accordingly, a new Central Sector Scheme "National Beekeeping and Honey Mission (NBHM)" for overall promotion & development of scientific beekeeping and production of quality honey & other beehive products is approved by the Govt. of India. The scheme is being implemented through National Bee Board as a Central Sector Scheme with funding by Central Government.

b. Under Mini Mission-II the Government wants to concentrate on post-harvest management of beekeeping/ beehive products including collection, processing, storage, marketing, value addition, etc. with a thrust to develop requisite infrastructural facilities for these activities; and the NBHM will work in coordination with other Governmental programs / schemes relating to promotion of beekeeping for the overall promotion & development of scientific beekeeping in the country.

c. NAFED has offered to implement the proposed project under the NBHM by the establishment of Hub and Spoke Models of Honey and Bee Products through Production, Processing, Branding and Marketing of Honey Involving FPOs of Beekeepers.

d. The Project would be based on Farmers/ FPOs/ FPEs already associated with NAFED on village and district levels with a number of Collection Centres / Minimal Processing Centres scattered at village and block levels.

e. The complete project has a estimated investment value of approximately INR 6230.24 Lacs for setting up of 5 Honey processing Plants, 30 Collection Centres, 5 Cold Storages and 5 in-house laboratories.

3. PROJECT SITE LOCATIONS

The Sites Identified for the Proposed Honey Processing Units are:

i. State – West Bengal
Geographical Coverage – 24 Parganas North and South Districts;

ii. State – Bihar
Geographical Coverage – East Champaran & Muzaffarpur Districts

iii. State – Uttar Pradesh
Geographical Coverage – Mathura District

iv. State – Madhya Pradesh
Geographical Coverage – Morena District

v. State – Rajasthan
Geographical Coverage – Bharatpur District.

(i) Interested and eligible bidder, shall be require to submit copy each of Technical bid along with the required documents to Head Office at NAFED House, Siddhartha Enclave, Ashram Chowk, New Delhi-110014, (hereinafter referred to as the "NAFED") before the last date & time given in this bid documents.

(ii) After scrutiny of Technical bids, NAFED shall shortlist the eligible bidders and inform them of the date and time of financial biding.

(iii) NAFED reserves the right to accept or reject any or all bids without assigning any reason thereof. The issue of this bid document does not in any way commit or otherwise obliges NAFED to proceed with all or any part of bid process.

1. ELIGIBILITY CRITERIA: -

i. The bidder shall be a Company registered under the Companies Act, 1956 or 2013 or a Partnership firm registered under the Indian Partnership Act, 1932 or The Limited Liability Partnership Act of 2008 at least for the last three years (*The bidder has to enclose Registration Certificate or any other documentary proof.*)

ii. The bidder's firm must be registered with the appropriate authority and shall be engaged in manufacturing and/ or supply of similar machines or turnkey execution of for the last three (3) years. The bidder has to enclose Registration Certificate or any other documentary proof.

iii. The bidder should have PAN, GST Registration, Udhyog Aadhar/ Udyam registration and Import License, as applicable in their case and should submit a copy of each of these documents along with acknowledgement copies of the IT Returns for the last 3 financial years.

iv. The bidder shall be in the business of Design, Fabrication, Supply, Erection and Commissioning of Chemical, Food Processing and Agro based Industries including/or MEP Services business in India or abroad and should have minimum average annual turnover of **Rs. 25.00 Crores** from relevant field in the last three years. [*In this connection bidders are required to submit the audited balance sheet and profit and loss account for last three financial* years duly *certified by a Chartered Accountant.*]

v. The bidder should be either an established Manufacturer of Food Processing Equipment or Authorized Supplier/ Dealer, Turnkey Solution Provider or EPC (*engineering, procurement and commissioning*) contractor for food processing lines.

vi. If the bidder is a Supplier or Authorized Dealer/distributor of a reputed foreign or Indian manufacturing company, the bidder has to enclose appropriate registration and OEM/dealership letter/certificate.

vii. **In last three years ,the bidder should have completed at least one job orders valued at Rs.5.00 Crores or three jobs of Rs.2.00 Crores or five job orders of Rs.1.00 Crore in the relevant field of application.** *(The bidder also required to enclose successful satisfactory supply/ work order and installation Certificate/Completion Certificate/Performance Certificate for work considered for claiming eligibility)*

viii. The bidder should not have been blacklisted or debarred from participating in tendering by the Central Government/State Government/other Government or Autonomous bodies or under a declaration of ineligibility for corrupt or fraudulent practices. (Undertaking to be given on company's letter head bearing company seal and duly signed by authorized representative)

ix. <u>Bids by a Consortium</u>: Bids submitted by a consortium shall comply with the following requirements.

a) The bid shall include a letter signed by all the members of the consortium who are bidding jointly for this work. (*A notarized copy of the duly executed Consortium Agreement, entered into between the consortiums partners shall be submitted in the technical bid as per Annexure-4*).

b) The contract shall be signed between the lead member and Nafed or as decided by Nafed / Consultant.

c) All payment transactions shall be done exclusively by the lead member of the consortium or as agreed between the Nafed and the consortium members at the time of the award of the work.

d) The lead member shall be authorized to incur liabilities and receive instructions for and on behalf of members of the consortium, and shall be responsible for delivery of all provisions of the contract.

e) Although lead member shall be responsible for the entire execution of the Contract yet other members of such entity shall also be jointly and severely liable for the performance of agreement.

f) A firm may be a member in only one consortium and cannot be member of other consortium bidding against this.

g) The Lead Member of the JV/Consortium shall maintain a minimum percentage share of 33.33% of the aggregate shareholding of the JV/Consortium during full tenure of contract/ Agreement. The change in the percentage stake of JV/Consortium members during execution period substantiated with specific reasons may be permitted with prior written approval of Nafed/ Consultant. [*Note: Any change in percentage stake of JV/Consortium members without prior written approval of Nafed shall be treated as Material Breach of Contract and an Event of Default entitling Nafed to forfeit the Security Deposit / Performance Guarantee and or to terminate the contract/ Agreement by giving 30 days notice*]

h) Bidders need to submit supporting documentary evidence in support of eligibility criteria. Nafed has the right to verify/cross verification of authenticity of the said documents whenever felt necessary.

2. INSTRUCTIONS TO BIDDERS:

i. **Cost of tender document:** Interested bidders may obtain the document from *" Nafed, Head Office" or Download from Nafed Website* on payment of **Rs. 5900/- (Rupees Five Thousand and nine hundred only)** (Non-refundable).

ii. The payment may be made by way of a crossed demand draft/ Banker's cheque from any scheduled bank, payable at New Delhi drawn in favour of **"Nafed".** Bidders may download document from Nafed's official website www.nafed-india.com and submit their bids along with Demand Draft/ Banker's Cheque of an amount of **Rs. 5900/- (Rupees Five Thousand and nine hundred only)** (Non-refundable) from any scheduled bank payable at New Delhi in favour of **"** Nafed**".**(*Please note: Banker's cheques should be accompanied with technical bids*)

iii. **Inspection of Plot:** Bidders may carry out survey of the Plot to be allotted in coordination with Nafed Branch Offices, for Setting up of the Honey Processing Plants, before submitting their respective Bids for award of the contract/Agreement. Nafed shall provide necessary permission and assistance to the prospective Bidders in this regard. No claim whatsoever consequent on any misunderstanding or otherwise shall be accepted by Nafed.

iv. **Pre-bid Meeting:** A pre-bid meeting will be held on-line through a Zoom Meeting on the date mentioned in the table titled "Important Information" to clarify concerns of prospective bidders in respect of scope of work and any other clauses of the document. Any change in the date of the pre-bid meeting will be notified on website www.nafed-india.com and will also be intimated to all prospective bidders who will

have purchased documents. Bidders willing to participate in the pre-bid meeting must send their full contact details and queries in writing or through email at least two days before the date of the pre-bid meeting. However, Nafed reserves the right not to answer any particular query or to answer in the way it deems appropriate.

v. **Late tenders:** Late tenders received after due date and time of submission of bid shall be out rightly rejected. The completed Bids shall be accepted only up to the date and time as specified in RFQ. The Bidders shall furnish the information strictly as per the formats given in the tender documents without any ambiguity. The Nafed shall not be held responsible if the failure of any Bidder to provide the information in the prescribed formats results in a lack of clarity in the interpretation and consequent disqualification of its Bid.

vi. **Verification and Disqualification:** Nafed reserves the right to verify all statements, information and documents submitted by the Bidder in response to the or the Bidding Documents and the Bidder shall, when so required by Nafed, make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification, by Nafed shall not relieve the Bidder of its obligations or liabilities hereunder nor shall it affect any rights of Nafed there under.

vii. No tender may be withdrawn, substituted, or modified in the interval between the deadline for submission of tenders and the expiration of the period of tender validity specified by the tenderer on the Letter of tender or any extension thereof. Withdrawal of tender during the specified period shall result in forfeiture of EMD deposited with tender.

viii. Tenders will not be considered if it is found to contain any false or misleading representations in statements/ attachments. If any submission is found false or misleading even at later stage (i.e. after the award of tender) then also, Nafed may annul the award. Further, the applicant may be blacklisted for participation in any future Tender of Nafed. In such a case Nafed shall forfeit the EMD (if any) and Security Deposit (if any) held with Nafed.

ix. No alternations shall be made in any of the tender documents supplied/ downloaded from the website. Tenderer by submission of this tender shall be deemed to have accepted the terms and conditions contained in the tender document.

x. No Bidder shall submit more than one bid for this tender.

xi. The Bidders shall submit Tender Document along with the EMD of and all Annexure in the prescribed format in form of a Demand Draft/ Banker's Cheque from any scheduled bank payable at New Delhi in favour of " Nafed**".**(*Please note: Banker's cheques should be accompanied with technical bids*)

xii. All documents submitted with the tender shall be in the English Language.

xiii. The documents including this and all attached documents, provided by Nafed shall remain or become the properties of Nafed and are transmitted to the Bidders solely for the purpose of preparation and the submission of a Bid in accordance herewith. Bidders are to treat all information as strictly confidential and shall not use it for any purpose other than for preparation and submission of their Bid. The provisions of this Clause shall also apply mutatis mutandis to Bids and all other documents submitted by the Bidders, and Nafed shall not return to the Bidders any Bid, document or any information provided along therewith.

xiv. Nafed reserves the right to accept or reject any or all proposals without assigning any reasons. No tenderer shall have any cause of action or claim against the Nafed for rejection of his proposal.

xv. This tender document is not an agreement and is not an offer or invitation by Nafed to any party. The terms for Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems on Turn-Key basis shall be as set out in separate agreement executed between Nafed and the successful Bidder.

xvi. The tenderers may obtain further information/ clarification, if any, in respect of the tender documents from the office of Nafed, New Delhi or the Technical Consultants to the Project.

3. COMPLETENESS OF RESPONSE:

i. Bidders are advised to study all instructions, forms, terms, requirements and other information in the tender documents carefully. Submission of bid will be deemed to have been done after careful study and examination of the tender document with full understanding of its implications.

ii. The response to this tender shall be full and complete in all respects. Failure to furnish all information required by the tender documents or submission of a proposal not substantially responsive to the tender documents in every respect will be at the Bidder's risk and may result in rejection of its proposal.

iii. The Bidders shall be responsible for the costs associated with the preparation of their bids, survey of site etc and their participation in the bidding process. Nafed will not be responsible or in any way liable for such costs, regardless of the conduct or outcome of the bidding process.

iv. All communications/documents submitted with the bid including a copy of this tender and the bid documents will be signed on each page by the authorized representative of the bidder. The signature on each page of the copy the tender document means that the bidder complies with all paras of the tender. Non compliance, if any, should be clearly mentioned and highlighted.

v. The Tender shall be filled in, signed with all particulars complete and submitted by the one duly authorized to do so. The Tenderer shall satisfy the Nafed that he is competent and authorized to submit the tender and/or to enter into a legally binding contract with the Nafed by furnishing documentary evidence in that respect.

vi. Amendment to the tender document:

a) At any time, prior to the date of submission of bids, Nafed may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify this.

b) The amendments shall be notified on the Nafed's official website www.nafed-india.com and these amendments will be binding on all bidders.

c) In order to provide the prospective bidders a reasonable time to take the amendment into account in preparing their bids, Nafed may, at its discretion, extend the deadline for the submission of bids suitably.

vii. EARNEST MONEY DEPOSIT (EMD):

a) Bidders shall submit, along with their Bids, EMD of 2% of the Contract Value in the form of a Demand Draft/ Banker's cheque/NEFT on any Scheduled /Commercial Bank, in favour of " Nafed" payable at New Delhi. EMD in any other form shall not be entertained. The EMD shall be denominated in Indian Rupees only. No interest will be payable to the Bidder on the amount of the EMD. Tenders without earnest money deposit or in any other form shall be summarily rejected.

b) Earnest money of successful tenderer who fails to honour the offer made to the Nafed as per tender submitted by him shall be forfeited.

c) The EMD of unsuccessful bidders would be returned to them at the earliest after expiry of the final bid validity and latest within one month of the signing of the contract with successful bidder.

d) The EMD may be forfeited:
If a Bidder withdraws his bid or increases his quoted prices during the period of bid validity or its extended period, if any;

OR

If the successful bidder fails to submit the non refundable security deposit and performance guarantee or sign the contract within specified time or found involved in any fraudulent or unethical practices.

e) No EMD exemption:
No bidder is exempted from submitting the EMD for this tender.

4. SUBMISSION OF BIDS:

a) The bids shall be unconditional, firm and valid for at least **120** calendar days from the date of submission of the bid.
[*Note: Any tenderer withdrawing or amending his tender within this period shall have to forfeit his earnest money to Nafed*].

b) The bidders shall submit their bids in two sealed parts namely, **"Technical bid"** and **"Financial bid",** marked as such along with the bidder's name, strictly in the format given in this document. The hardcopy of the technical proposal should be in a single sealed envelope, clearly marked as "Technical Proposal from <<Bidder Name>>". The hardcopy of the financial proposal should be in a separate sealed envelope, clearly marked as "Financial Proposal from <<Bidder Name>>".

c) **Both the above envelopes should be submitted in a separate sealed envelope clearly marked as** "RFQ for Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems along with Civil works on Turn-Key basis ".

i. Each page of the Bid document shall be serially numbered and also total number of pages shall be indicated on each page. E.g. 1/8, 2/8, 3/8. etc.
ii. All pages of the Bid documents along with supporting documents shall be signed by the authorized person.
iii. The bidder must give its name and address on the envelope.

d) Any proposal received by Nafed after the last date and time of submission of bids shall be rejected.

e) The bids submitted by fax/e-mail etc. shall not be considered. No correspondence will be entertained on this matter.

f) Nafed shall not be responsible for any postal delay or non-receipt/ non-delivery of the documents. No further correspondence on the subject shall be entertained. Only complete bid document, received by due date prior to schedule time shall be taken as valid. Bids received without Earnest Money Deposit and tender cost shall be summarily rejected.

g) For interpretation of any clause of this tender, the decision of Nafed would be final and binding on the bidder.

5. Last date & place of submission of bids:

a) Bids complete in all respects may be submitted to the *Nafed Head Office, Sidharth Enclave, Ashram Chowk, New Delhi-110014"* latest by last date of submission given in the table titled "Important Information" of this tender document. Bids received after due date & time shall not be considered. Bids submitted through post or through Courier Service must reach on or before the due date and time. Any transit delay will be at the risk of the bidder.

b) The completed bids shall be accepted only up to the date and time as specified in NIT. The bidders shall furnish the information strictly as per the formats given in the tender documents without any ambiguity. The Nafed shall not be held responsible if the failure of any Bidder to provide the information in the prescribed formats results in a lack of clarity in the interpretation and consequent disqualification of its Bid. The Bidder has to submit the Cost of Bid Document and Bid Security (EMD) in Original on or before due date and time of submission of Bid, failing which Bid shall be summarily rejected.

6. Opening of BIDs:

a. The technical bid of all tenderers shall be opened by the opening committee on the specified date as mentioned, in the presence of the authorized representatives of the tenderers who choose to be present. If such nominated date for opening of tender is subsequently declared as a Public Holiday by Nafed, the next official working day shall be deemed as the date of opening of Technical Bids.

b. Technical bids of those tenderers who have not submitted EMD shall not be opened. Tender which is accompanied by an unacceptable or fraudulent tender EMD shall be considered as non - compliant and rejected.

c. The Tender of any tenderer who has not complied with one or more of the foregoing instructions if includes critical information or compliance may not be considered. The details will be read out for the information of representative of tenderers, present at the time of opening of Tender. On opening of the Tender, it will be checked if they contain Technical & Financial Bids. Technical bids of the tenderers not containing financial bids shall not be opened.

d. The Tenderers representatives who attend the bid opening shall sign the attendance sheet. [*Letter of authorization shall be submitted by the bidders before they are allowed to participate in bid opening*]. A maximum of two representatives for any bidder shall be permitted to attend the bid opening.

e. The sealed financial bids will be opened on a subsequent date after evaluation of technical bids. Financial bids of only those tenderers whose submissions are found substantially responsive and technically compliant will be opened. The time of opening of financial bids shall be informed separately to only the Tenderers who have qualified

during Technical evaluation stages and bidder(s) can be present to witness opening of Financial Bids.

f. Nafed shall open the bids on the due date of bid submission, at the place & time specified in this document and in the presence of the Bidders who choose to attend.

7. CLARIFICATION OF BIDS:

To assist in the examination, evaluation and comparison of bids, Nafed, may at its discretion ask any bidder for any clarification of its bid. The request for the clarification by Nafed and the responses to be submitted by bidders shall be in writing or through email. However, no unsolicited post bid clarification at the initiative of the bidder shall be entertained.

8. BID DOCUMENTS FOR EVALUATION PROCESS:

A. Documents required for technical Bid:

i. Copy of Certificate of Incorporation /Registration of company or firm under company's act or partnership act.

ii. PAN together with copy of trade license, registration of GST etc.

iii. Copy of the duly audited balance sheet & profit & loss a/c. for the last three financial years.

iv. Undertaking to be given on company's /firm's letter head bearing company seal and duly signed by authorized representative, with a list of work orders and successful contracts to its credit for running above business;

v. Name, Address, telephone, mobile & fax no. of the contact person of the firm.

vi. Undertaking by bidder on company's / firm's letter head bearing company seal for not Blacklisted or debarred by Govt./PSU from participating in tendering process.

vii. Demand Draft/NEFT for 2% of the Contract Value towards EMD in favour of Nafed' payable at New Delhi .

viii. Demand Draft for Rs.5900/- towards the cost of tender document in favour of Nafed' payable at New Delhi (*applicable in case of downloaded tender document*).

ix. All communications/documents submitted with the bid including a copy of this tender and the bid documents duly signed on each page by the authorized representative of the bidder.

x. Power of Attorney to the person authorized for signing the bid for this tender [Note: The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and when it is so required the same should be under common seal affixed in accordance with the required procedure. It should be on non-judicial stamp paper of Rs.100/- at least duly notarized with supported by copy of Board of Resolution passed for this purpose only in case of company.]

xi. Consortium agreement or MOU (in case of consortium)

xii. Undertaking for responsibility by Consortium (Annexure-5)

xiii. All relevant documents required as evidence of meeting technical evaluation criteria and other criteria mentioned anywhere in tender document.

xiv. The bidder is free to submit any additional information which may be relevant for evaluation of the tender.

B. Documents required for Financial bid:

i. The financial bid should be furnished in the format at Annexure 6, clearly indicating the financial offer in both figures and words, in Indian Rupees. In the event of any difference between figures and words, the amount indicated in words shall be taken into account.

ii. The bidders shall be responsible for all of the costs associated with the preparation of their Bids and their participation in the Bidding Process. Nafed shall not be responsible or in any way liable for such costs, regardless of the conduct or outcome of the Bidding Process.

C. Evaluation Procedure:

Selection of the bidder(s) will be based on technical and financial evaluation of the bid. The evaluation will be in two stages i.e. technical and financial.

i. Overview of evaluation procedure:

The evaluation of technical bids shall be undertaken by a committee of the officers and consultants duly constituted for this purpose. The technical evaluation would be based on the following:

a. The assessment of bidders meeting the eligibility criteria.

b. The assessment of the capability of bidder to carry out desired scope of contract shall be assessed on the basis of carrying out past works in preceding three years.

ii. Financial bids of only those bidders will be opened whose bids have been technically found suitable.

iii. Nafed shall open financial Bids of all Tenderers who have submitted substantially responsive technical tenders, in the presence of tenderer's representatives who choose to attend at the address, date and time informed / specified by Nafed. The financial bids of the bidders shall be opened one at a time, reading out: the name of the Tenderer and whether there is a modification; the Tender Price(s) and any other details as Nafed may consider appropriate.

iv. In case two or more bids are of the same rates then Bidder whose higher number of similar jobs will be selected. However, Nafed 's decision shall be binding and final.

v. In the event of discrepancy in the rates written in words and the figures, rates quoted in words will be considered.

vi. The Tenderers' representatives who are present shall be requested to sign the attendance sheet.

vii. The evaluation and assessment for the selection of the Bidder(s) shall be based on the Prices quoted by the Bidders. The Bidder, quoting the **lowest price,** shall be declared

the **"Provisionally Selected Vendor"** and his offer shall be evaluated and assessed by Nafed.

viii. From the time the Proposals are opened to the time the Contract is awarded, the bidder should not contact Nafed or any party related to the Tender on any matter related to its Technical and/or Financial Proposal. Any effort by a bidder to influence Nafed in the examination, evaluation, and recommendation for award of Contract may result in the rejection of its bid.

viii. Evaluators of Technical Proposals shall have no access to the Financial Proposals until the technical evaluation is concluded.

ix. Conditional tenders shall be out rightly rejected.

xii. For any query from Applicants, Nafed reserves the right not to offer clarifications on any issue raised in a query or if it perceives that the clarifications can only be made at a later stage, it can do so at a later date. No extension of any deadline will be granted on that count or grounds that Nafed have not responded to any query or not provided any clarification. **Tenderers may clearly note the date and time of submission of bid for this tender. No late or delayed Tender will be accepted.. However Nafed may ask for any supplementary information, if deemed so after opening of bids**.

xiii. Tenderers are advised that the selection process will be entirely at the discretion of Nafed

9. <u>AWARD OF CONTRACT</u>:

i. After evaluation of bids, Letter of Intent (the "LOI") shall be issued by Nafed to the Selected Bidder and the Selected Bidder shall, within 7 (Seven) days of the receipt of the LOI submit the Letter of Acceptance (LOA) in acknowledgement and unconditional acceptance thereof along with Performance Security (in form of a bank guarantee as per Annexure 7) equivalent to 5% of the Contract value. In the event, the LOA duly signed by the Selected Bidder is not received by the stipulated date, Nafed may, unless it consents to extension of time for submission thereof, forfeit the EMD of such Bidder as Damages on account of failure of the Selected Bidder to unconditionally accept the terms of LOI.

ii. After submission of duly signed LOA along with " Performance Security Deposit equivalent to 5% of the Contract value " the Site shall be handed over to Contractor within 10 days on the terms and conditions hereunder contained in this tender document.

iii. The contract/ Agreement shall be executed within 10 days after handing over of the designated site. Payment of stamp duty on agreement, if any, to be executed in pursuance of this bid shall be borne by successful bidder

iv. Selected bidder will get a free period of two weeks effective from the date of handing over of the site, during which bidder can complete all necessary work planning and moblisation required for proper planning of execution of the contract.

v. Selected bidder shall perform the obligations and exercise the rights under the contract/ Agreement within the period prescribed in document. The Selected Bidder shall not be entitled to seek any deviation, modification or amendment in the contract/ Agreement.

vi. The successful bidder agrees voluntarily and unequivocally not to seek any claim, damages, compensation or any other consideration whatsoever, on account of delay in approval by Nafed nor engage in any form of correspondence in this regard.

10. SECURITY DEPOSIT:

Successful bidder shall deposit Performance Security Deposit equivalent to 5% of the Contract value to Nafed in advance within 15 days of issue of LoI.

Payment of Performance Security Deposit equivalent to 5% of the Contract value along with Letter of Acceptance.	Within 7 days of issue of Letter of Intent.
Site to be handed over to Selected Bidder	Within 10 days after the State Government/FPO provides peaceful possession of the site to Nafed
Free Period	15 days from the date of handing over of plot
Commencement of the Time Lines for the contract/ agreement.	Effective after 15 days from date of handing over of the Site.

i. Performance security shall be accepted in the form :

Irrevocable Bank Guarantee towards performance security in the prescribed format (Annexure-VII) issued by any Nationalized Bank or other Scheduled Commercial Banks, acceptable to Nafed , with branches located in New Delhi and the payment in case of revocation of BG to be made by its New Delhi Branch only. The Bank Guarantee shall be valid for contract period plus six months.

ii. In case of a joint venture, the Performance security shall be submitted in the name of the JV. However, splitting of the Performance Guarantee (while ensuring the Performance Security is in the name of **J**V) and its submission by different members of the JV for an amount proportionate to their participation ratio is also acceptable.

iii. Performance security shall be refunded after completion of the defect liability period of 6 months of the completion date of contract against a request letter.

iv. Performance security may be forfeited if there is a termination of agreement on account of Material Breach of Contract or Non Performance for a period of more than 4 weeks. In such cases, Nafed reserves the right to get the work done by other party/ parties and recover any amounts higher than the contact amount from the contractor, after adjusting the dues from forfeited Performance Security. However, no part of the forfeited performance security shall be refunded in any circumstances.

v. Nafed reserves the right for deduction of dues from the Performance Security or Due Payments for: -

a. Any amount imposed as a fine by Nafed or any local Govt. Body for irregularities committed by the contractor.

b. Any amount which Nafed becomes liable to the Government/Third party due to any default of the contractor or any of his director/ employees/ representatives/ servant/ agent, etc.

c. Any payment/ fine made payable under the order/judgment of any court/consumer forum or law enforcing Contractor or any person duly empowered against the contractor or his staff on account of this contract.

d. Any outstanding payment/ claims of any sub-vendor , sub-contractor or any local Contractor remained due after completion of the job as per agreement.

vi. If the contractor due to some unforeseen reason wishes to surrender the contract before completion of the Job or expiry of the term then also the security deposit and all amounts lying payable with Nafed shall be forfeited.

If bidder fails to comply LOA conditions, the LOA may stand cancelled and Earnest Money/ Security Deposit submitted may be forfeited.

The bidder voluntarily and unequivocally agrees not to seek any claim, Compensation, damages or any other consideration whatsoever on this account.

11. PAYMENT TERMS AND CONDITIONS:

An Agreement will be executed with the successful bidder with detailed Payment terms.

12. PRICES

i. The Price to be quoted F.O.R. (Freight on Road) Destination only and it's should be inclusive of taxes, freight, Packing, Transit, Installation, Insurance, Inspection Charges etc.

ii. Demurrage charges if any will be borne by the contractor/supplier only.

iii. Prices charged by the contractor / supplier for goods delivered and services performed under the contract shall not be higher than the price quoted by the supplier in his bid.

iv. Prices will be fixed at the time of issue of Letter of Award as per taxes and statutory duties applicable at that time.

v. In case of reduction of taxes and other statutory duties during the scheduled delivery period, NAFED shall take into account there deduction in these taxes/duties for the supplies made from the date of enactment of revised duties/taxes.

vi. In case of increase in duties/taxes during the scheduled delivery period, the NAFED shall revise the prices as per new duties/taxes for the supplies, to be made during the remaining delivery period as per terms and conditions of the purchase order with prior written approval from NAFED.

vii. Any increase in taxes and others statutory duties/levies after the expiry of scheduled delivery date or award of contract/work order shall be to the supplier account. However, benefit of any decrease in these taxes/duties shall be passed on to NAFED by the supplier.

viii. The Tenderers may quote rates of Imported Equipment in INR only.

13. PENALTY CLAUSE:

i. Contractor will be penalized up to Rs.5,000/- per offence on the following offenses:

ii. Delayed payment of Labour wages beyond 10 days

iii. Not following the instructions of the Nafed or Consultant within 10 days of it being brought to the notice of the contractor.

iv. Any staff of contractor found in drunken condition/indulging in bad conduct or found creating nuisance in Nafed premises

v. Improper maintenance & defacement of the Nafed Property.

vi. Regular joint inspection will be conducted by Nafed officials and Consultant. Discrepancy noticed or instructions issued by Nafed shall be rectified / complied within a period of 7 days, failing which Nafed reserves the right to impose fine up to Rs.5,000/-per instance of violation per week. Deliberate or willful noncompliance of Nafed's written instructions for a period of 90 days shall constitute Material breach and Event of Default, which shall entitle Nafed to en-cash Performance security in part or full and or terminate the Agreement after giving 90 days notice to the contractor.

i. Such termination of the contract/ Agreement and forfeiture of the performance security by Nafed shall be without prejudice to any other damages, rights or remedies applicable under law in its favour.

14. NEGOTIATIONS

Normally there will be no post tender opening negotiations and it would be only on exceptional circumstances, if considered necessary on account of the bid being more than 105 above the estimated cost as per DPR and Approval Letters from NBB. This shall be held only with the bidder evaluated as L-1 bidder after evaluation of Financial bids, as indicated above. Under no circumstance, the financial negotiation shall result into an increase in the price originally quoted by the Contractor.

15. COMPETENT AUTHORITY'S RIGHT TO VARY ITEMS/ACTIVITIES AT THE TIME OF AWARD

The Competent Authority in this case shall be NAFED who shall have the right to make any alterations, omissions, additions or subtractions in items/services at the time of award of contract or during the implementation in the interest of the Project.

The Competent Authority will give such intimation to the successful contractor, and additional cost/deduction in the Bid prices, based on the price schedule submitted by him, will be worked out with the Bidder. In case, the Bidder does not agree for such alterations, the Competent Authority will be free to award the contract to the next eligible Bidder.

16. LABOUR LAWS AND SAFETY MEASURES

i. Contractor shall comply with all the provisions of labour law related legislation/acts as enacted by Government from time to time and in case of any prosecution / penalty, Contractor shall be liable for the same.

ii. Contractor shall be liable for payments of duties viz. P.F., E.S.I. etc. including any compensation payable under Workmen Compensation Act. NAFED or its JV shall have no responsibility, financial or other liabilities towards professionals employed by the Contractor.

iii. Contractor will take all safety measures / precautions during the work. For any accident due to negligence / any other reason during contract period, it shall be sole responsibility of the Contractor and NAFED or its JV shall not be held responsible for the same.

17. INSPECTIONS AND TESTS

The NAFED or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Contract specifications at no extra cost to the NAFED. Standard Contract Conditioned and the Technical Specifications shall specify what inspections and tests the NAFED requires and where they are to be conducted. The NAFED shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

The inspections and tests may be conducted on the premises of the Supplier or its subcontractor(s), at point of delivery, and/or at the Goods' final destination. If conducted on the premises of the Supplier or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the NAFED.

Should any inspected or tested Goods fail to conform to the Specifications, the NAFED/NAFED's representatives may reject the Goods, and the Supplier shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the NAFED.

The NAFED's/NAFED's representatives' right to inspect test and, where necessary, reject the Goods after the Goods' arrival in the NAFED's site shall in no way be limited or waived by reason of the Goods having previously been inspected, tested, and passed by the NAFED or its representative prior to the Goods shipment.

Nothing in Clause 18 shall in any way release the Supplier from any warranty or other obligations under this Contract.

18. PACKING

The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destinations indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in Standard Conditions of Contract, and in any subsequent instructions ordered by the NAFED.

19. DELIVERY AND DOCUMENTS

Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in the Schedule of Requirements. The details of shipping and/or other documents to be furnished by the Supplier are specified in Standard Conditions of Contract.

For purposes of the Contract, "EXW," "FOB," "FCA", "CIF", "CIP" and other trade terms used to describe the obligations of the parties shall have the meanings assigned to them by the current edition of Incoterms published by the International Chamber of Commerce, Paris.

Documents to be submitted by the Supplier are specified in Standard Conditions of Contract.

20. INSURANCE

The Goods supplied under the Contract shall be fully insured in Indian Rupeers or a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the Standard Conditions of Contract.

Where delivery of the Goods is required by the NAFED on a CIF or CIP basis, the Supplier shall arrange and pay for cargo insurance, naming the NAFED as beneficiary.

Where delivery is on a FOB or FCA basis, insurance shall be the responsibility of the appointed Agency/Agencies.

21. TRANSPORTATION

Where the Supplier is required under Contract to deliver the Goods FOB, transport of the Goods, up to and including the point of putting the Goods on board the vessel at the specified port of loading, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price. Where the Supplier is required under the Contract to deliver the Goods FCA, transport of the Goods and delivery into the custody of the carrier at the place named by the NAFED or other agreed point shall he arranged and paid for by the Supplier and the cost thereof shall be included in the Contract Price.

Where the Supplier is required under Contract to deliver the Goods CIF or CIP, transport of the Goods to the port of destination or such other named place of destination in India, as shall be specified in the Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price.

Where the Supplier is required under the Contract to transport the Goods to a specified place of destination within the NAFED's country, defined as the Project Site, transport to such place of destination in India, including insurance and storage, as shall be specified in the Contract, shall be arranged by the Supplier, and related costs shall be included in the Contract Price.

Where the Supplier is required under Contract to deliver the Goods CIF or CIP, no restriction shall be placed on the choice of carrier. Where the Supplier is required under Contract (a) to deliver the Goods FOB or FCA, and (b) to arrange on behalf and at the expense of the NAFED for international transportation on specified carriers or on national flag carriers of India, the Supplier may arrange for such transportation on alternative carriers if the specified or national flag carriers are not available to transport the Goods within the period(s) specified in the Contract.

22. INCIDENTAL SERVICES

The Supplier may be required to provide any or all of the following services, including additional services, if any, specified in Standard Conditions of Contract:

(a) performance or supervision of on-site assembly and/or start-up of the supplied Goods;

(b) furnishing of tools required for assembly and/or maintenance of the supplied Goods;

(c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;

(d) performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and

(e) Training of the NAFED's or JV's personnel, at the Supplier's plant and/or on-site, in assembly,start-up operation, maintenance, and/or repair of the supplied Goods.

Prices charged by the Supplier for incidental services, if not included in the Contract Price for the Goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

23. SPARE PARTS

23.1 As specified in **Conditions of Contract/Agreement** , the Supplier may be required to provide any or all of the following materials, notifications and information pertaining to spare parts manufactured or distributed by the Supplier:

(a) such spare parts as NAFED may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under the Contract; and

(b) in the event of termination of production of the spare parts:

(i) advance notification to the NAFED of the pending termination, in sufficient time to permit the NAFED to procure needed requirements; and

(ii) following such termination, furnishing at no cost to the NAFED, the blueprints,drawings, and specifications of the spare parts, if requested.

24. WARRANTY

The Supplier warrants that the Goods supplied under the Contract are new, unused, of the most recent or current models and those they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that all Goods supplied under this Contract shall have no defect, arising from design, materials, or workmanship or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination.

This warranty shall remain valid for twelve (12) months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the Contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise in Standard Conditions of Contract.

The NAFED shall promptly notify the Supplier in writing of any claims arising under this warranty.

Upon receipt of such notice the Supplier shall, within the period specified in Standard Conditions of Contract and with all reasonable speed, repair or replace the defective Goods or parts thereof without costs to the NAFED other than, where applicable the cost of inland delivery of the repaired or replaced Goods or parts from EXW or the port or place of entry to the final destination.

If the Supplier, having been notified, fails to remedy the defect(s) within the period specified in Standard Conditions of Contract, the NAFED may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the NAFED may have against the supplier under the contract.

25. CHANGE ORDERS

NAFED may at anytime, by a written order given to the Supplier pursuant to above Clauses, make changes within the general scope of the Contract in any one or more of the following:

(a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the NAFED;

(b) the method of shipment or packing;

(c) the place of delivery; and/or

(d) the Services to be provided by the Supplier.

If any such change causes an increase or decrease in the cost of, or the time required for, the Suppliers performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this clause must be asserted within thirty (30) days from the date of the Supplier's receipt of the NAFED's change order.

26. CONTRACT AMENDMENTS

26.1 Subject to Agreement Conditions in Clause 18, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

27. ASSIGNMENT

27.1 The Supplier shall not assign, either in whole or in part, its contractual duties, responsibilities and obligations to perform the contract, except with the NAFED’s prior written permission.

28. SUBCONTRACTS

The Supplier shall notify the NAFED in writing of all subcontracts awarded under this Contract if not already specified in the bid. Such notification in, the original bid or later shall not relieve the Supplier from any liability or obligation under the Contract.

Subcontracts must comply with the provisions of Clause 3 of the Contract.

(i) The Supplier shall notify the NAFED in writing of all sub contracts awarded under the contract if not already specified in its tender. Such notification, in its original tender or

later, shall not relieve the Supplier from any of its liability or obligation under the terms and conditions of the contract.

(ii) Sub contract shall be only for bought out items and sub-assemblies.

(iii) Sub contracts shall also comply with the provisions of "Country of Origin".

29. DELAYS IN THE SUPPLIER'S PERFORMANCE

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

If at any time during performance of the Contract, the Supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Supplier shall promptly notify the NAFED in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the NAFED shall evaluate the situation and may at its discretion extend the Supplier's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of Contract.

Except as provided under Agreement Conditions Clause 19, a delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to above Clause, unless an extension of time is agreed upon pursuant to above Clauses without the application of liquidated damages. The period for settling the liquidated damages shall not be more than 2 months.

30. INSURANCE AND MEDICAL FOR STAFF.

It shall be the responsibility of the Contractor to insure their staff and equipment against any exigency that may occur while carrying out the project activities. Contractor will also take insurance cover for third party liability, which might occur due to damages caused to their manpower, equipment etc. The NAFED or its JV shall not be responsible for any such damages.

Medical facilities (as per law) for the professionals including insurance of the professionals related to the project will be provided by the Contractor.

All the statutory requirements/compliances, if required, i.e., labour law, PF, ESI, etc. has to be met by the successful bidder/contractor and in no case, NAFED shall be liable for any kind of lapses in this regard.

31. INDEMNIFICATION

i. The Contractor shall indemnify and hold the NAFED or its JV harmless against all third party claims of infringement of patent, trade mark of industrial design rights arising from use of the stores supplied or any part thereof.

ii. Contractor shall at times indemnify and keep the NAFED or its JV indemnified against all claims/ damages etc. for any infringement of any Intellectual Property Rights (IPR) while providing its services under this contract.

iii. Contractor shall at all times indemnify and keep NAFED or its JV indemnified against any claims in respect of any damages or compensation payable in consequences of any accident or injury sustained or suffered by its (Contractor) employees or caused by any action, omission or operation conducted by or on behalf of Agencies.

iv. Contractor shall at all times indemnify and keep NAFED or its JV indemnified against any and all claims by employees, workman, suppliers, agent(s) employed engaged or otherwise working for Contractor, in respect of their wages, salaries, remuneration, compensation or the hike.

v. All claims regarding indemnity shall survive the termination or expiry of the contract.

32. GENERAL TERMS AND CONDITIONS:

32.1 <u>TAXES AND OTHER STATUTORY DUES:</u>

i) GST shall be payable as applicable by the successful bidder.

ii) Payment of stamp duty for execution of Agreement, Registration Charges and any other related Legal Documentation charges/incidental charges in pursuance of this tender will be borne by Contractor.

iii. All Taxes & Municipal taxes, if any applicable, shall be borne solely by the Contractor.

iv. Nafed will not permit any third party lien/mortgaging of any component of the supply of this tender to any bank/financial institution. Bidder will have to make arrangement of funds from its own sources.

v. The payments dues if any on the said plots shall be paid by the NAFED or its JV.

vi. All the compliances related to Income tax like TDS, TCS, etc. shall be adhered by contractor/successful bidder.

33.2 <u>EVENTS OF DEFAULT AND TERMINATION OF CONTRACT:</u>

Following shall be considered Material Breach of the Contract by Contractor resulting in Contractor's Events of Default:-

i) If the successful bidder fails to start work at site within 21 days of signing of the Agreement.

ii) If the Contractor is found guilty of persistently breaching the local laws.

iii) If at any time during the subsistence of the contract/ Agreement, there is nonconformity to the contract/ Agreement or any time during the contract/ Agreement, the Contractor indicates its unwillingness to abide by any clause of this contract/ Agreement or repudiates the Agreement.

iv) If the Contractor is in persistent non-compliance of the written instructions of a Nafed officials.

v) If Contractor is in violation of any of the other Clauses of this tender or agreement and after written notice from Nafed fails to cure or rectify the default/ fault to the satisfaction of Nafed.

vi) If the Contractor or any of its representatives cause an incident or accident that results in injury or death of any body or loss to Nafed property.

vii) If any of the above Material Breach and Contractor Events of Default happens, then Nafed, after giving due notice to the Contractor to Cure the Default, shall be entitled to terminate the Agreement. For the avoidance of Doubt, it is clarified that the Cure Period available to the Contractor shall be as decided by Nafed.

In all other cases of Contractor's Event of Default where specific notice period is not provided, Nafed shall issue a Notice to Contractor to cure the Default within 15 days. If the Contractor fails to cure the Default within 15 days, Nafed after giving a final 15 days notice shall be entitled to terminate the Agreement.

34.3 <u>TERMINATION OF AGREEMENT:</u>

Partial surrender of contract/ agreement shall not be allowed to the Contractor.

i. The NAFED, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part;

(a) if the Supplier fails to deliver any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the NAFED pursuant to above Clause; or

(b) if the Supplier fails to perform any other obligation(s) under the Contract,

(c) if the Supplier in the judgment of the NAFED, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

(d) For the purpose of this clause “Corrupt practice” means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the action of a public official in the procurement
process or in contract execution.

(e) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition.

2. In the event the NAFED terminates the Contract in whole or in part, pursuant to other Clauses, the NAFED may procure upon such terms and in such manner as it deems appropriate. Goods or Services similar to those undelivered and the Supplier shall be liable to the NAFED for any excess costs for such similar Goods or Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

3. The NAFED may at any time terminate the Contract by giving written notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the NAFED.

4. The NAFED, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the NAFEDs convenience, the extent to which performance of

the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

5. The Goods that are complete and ready for shipment within thirty (30) days after the Supplier's receipt of notice of termination shall be accepted by the NAFED at the Contract terms and prices. For the remaining Goods, the NAFED may elect:

35. NOTICES

Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by cable, e-mail or facsimile and confirmed in writing to the other party's address specified in the contract within 7 days of date of issue of notice.

A notice shall be effective when delivered or on the notice's effective date, whichever is later.

36. <u>CANCELLATION OF CONTRACT IN FULL OR PART:</u>

If the Nafed cancels / terminates the contract in full or in part on account of:

a. Force Majeure (Refer Clause No. 41)

b. Any other cause, which in the absolute discretion of the authority mentioned in contract, is beyond control of the Nafed

c. In the event of any one or more of the above courses being adopted by the Nafed, the Contractor, shall have no claim for any compensation or any losses sustained by him by reason of his having purchased or procured any material or entered into any agreements or made any advances on account of or with a view to the execution of the work for the performance of the Contractor.

d. Nafed reserve the rights to terminate the contract/ Agreement by giving two months advance notice in such exigency. The contract/ agreement will stand terminated and the Performance Guarantee will be refunded after adjusting outstanding dues, if any. The Contractor voluntarily agrees not to seek any claim, compensation, damages or any other consideration whatsoever on any ground in this regard.

e. In the event of the Contractor failing to pay any other charges which the Contractor may be required to pay, Nafed will have the right to terminate the contract/ agreement after giving a Show Cause Notice of 30 days and discontinue/ confiscate the entire infrastructure and without prejudice to any of its rights shall also forfeit the Contractor's security deposit.

37. ELECTRIC POWER SUPPLY:

i. NAFED or its JV shall ne responsible for getting a Power Connection from the SEB and Contractor shall be responsible for setting up the Power receiving station and distribution set up at each of the sites.

ii. Proper electricity distribution, lighting and earthing shall be installed at the site by the contractor under its scope of work.

iii. The Contractor shall bear the amount of all the bills/costs for the electricity that may be consumed during the installation and commissioning of Honey Processing Plant along with its auxiliary systems under this agreement.

iv. Contractor shall follow the I.E. Rules, Acts for safety of equipment, public & Staff.

v. Contractor shall use energy efficient equipment during installation and commissioning.

38. PACKING (Conditions of Contract/Agreement):

a) Packing instruction: Each package will be marked on three sides with proper paint / indelible ink with the following

i) Name of the consignee
ii) Project
iii) Contract No.
iv) Country of origin of goods
v) Supplier's name
vi) Packing list reference

b) Unloading and storage instruction: - The supplier shall furnish unloadinginstruction and storage instruction for each equipment.

c) The supplier shall furnish copies of the list of contents in each package as mentioned in clause 38 (a) and a copy of the list shall also be kept inside the package. The supplier shall further, notwithstanding any exercise by the inspecting officer of the power of superintendence, be responsible for the sufficiency of the packing, marking etc. of all the supplier's equipments to ensure their delivery at destination without damage.

39. DELIVERY AND DOCUMENTATION

a) For goods supplied from abroad;

i. Add the following at the beginning of the clause "All the goods shall be shipped under the deck".

ii. Within 24 hours of shipment, the supplier shall notify the NAFED and the insurance company by cable or telex or fax the full details of the shipment including contract number, description of Goods, quantity, the vessel, the bill of lading number and date, port of lading, date of shipment, port of discharge etc. The supplier shall mail the following documents to NAFED with a copy to insurance company.

b) Documents

(i) 5 copies of Supplier's invoice showing contract number, goods description, quantity, unit price and total amount;

(ii) Original and 5 copies of the negotiable, Clean, on-board bill of lading marked freight prepaid and 5 copies of non-negotiable bill of lading;

(iii) 5 copies of packing list identifying contents of each package as per Clause above;

(iv) Insurance certificate;

(v) Manufacturer's / Supplier's warranty certificate;

(vi) Inspection certificate issued by the nominated inspection agency, and the Supplier's factory inspection report; and

(vii) Certificate of origin.

The above documents shall be received by the NAFED at least one week before arrival of Goods at the Port or place of arrival and, if not received, the Supplier will be responsible for any consequent expenses.

c) For Goods from within India;

40. LIMITATION OF LIABILITY

Except in cases of criminal negligence or willful misconduct, and in the case of infringement pursuant to Clause 24.

(a) The Supplier shall not be liable to the NAFED, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the NAFED; and

(b) The aggregate liability of the Supplier to the NAFED, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

41. <u>FORCE MAJEURE</u>:

a). Force Majeure means any event or combination of events or circumstances beyond the control of the parties hereto which cannot (a) by the exercise of reasonable diligence, or (b) despite the adoption of reasonable precaution and/or alternative measures, be prevented or caused to be prevented and which adversely affects the abilities of the parties to perform obligations under this Agreement, which shall include but not be limited to : (a) Acts of God i.e. fire, drought, flood, earthquake, epidemics, pandemics, natural disaster; (b) Explosions or accidents, air crashes and shipwrecks, act of terrorism: (c) Strikes or lock outs industrial disputes: (d) War and possibilities of war, riots, bandh, act of terrorism or civil commotion; (e) The promulgation of or amendment in any law, rule or regulation or the issue of any injunction, court order or direction from any Government Authority that prevents or restricts a party from complying with any or all the terms and conditions as agreed in this agreement; (h) Any event or circumstances analogous to the foregoing.

(b) That, it is agreed between the parties that the performance of obligations under this agreement is subject to the force majeure condition which shall mean any event or combination of events or circumstances beyond the control of the parties hereto.

(c) Neither party will be liable for performance delays or for non-performance due to causes beyond its reasonable control, except for payment obligations.

(d) During the continuance of Force Majeure, NAFED reserves the right to alter or vary the terms and conditions of this agreement or if the circumstances so warrant, NAFED may also suspend the agreement for such period as is considered expedient, the successful

bidder agrees and consents that they shall have no right to raise any claim, compensation of any nature whatsoever for or with regard to such suspension.

(e) The successful bidder agrees and understands that if Force Majeure condition continues for a long period then NAFED in its own judgment and discretion, may terminate this Agreement and in such case, the successful bidder agrees that the shall have no right or claim of any nature whatsoever and NAFED shall be released and discharged of all its obligations and liabilities under this Agreement.

42. <u>VACATION OF SPACE:</u>

i. The Contractor shall after successful commissioning of each of the sites, deliver to the Nafed or its JV the peaceful vacant physical possession of the Site with all permanent, temporary structures ,Plant and machinery installed by the Contractor after the completion of the erection and commissioning. If the Site along with the structures including electrical installation etc. are not handed over in good condition, the Nafed shall reserve the right to seek damages and shall be liable to recover costs and expenses to repair/ renovate the said items which are found to be not as per contract.

ii. If the successful bidder fails to vacate the Sites as per schedule, Nafed within a grace period of 30 days from the date of termination of the contract/ agreement, the contracted Contractor shall be deemed to be an unauthorized/illegal occupant of the said site under the provisions of Public Premises (Eviction of Unauthorized Occupants) Act, 1971 and **amendment**s thereof.

The Contractor will also be liable to pay a penalty @ Rs.50000.00 per week for the entire period of such occupation. Nafed shall also be entitled to forfeit the security deposit and revoke the bank guarantee of the contract/Contractor for such unauthorized and illegal occupation of the said site.

iii. A certificate from the authorized representative of Nafed in proof of Contractor having vacated the site will be required to be submitted by the Contractor. Any claim of vacation / non-vacation without the endorsement of Station Officers/authorized Nafed representative shall not be entertained.

iv. Contractor shall remove all the construction and fabrication materials from the premises within 15 days of issue of termination letter, failing which these shall become property of Nafed

43. <u>INDEMNIFICATION:</u>

i. All other statutory taxes, statutory dues, local levies, as applicable shall be remitted to the Government by the Contractor

ii. The successful bidder shall indemnify Nafed from any claims that may arise from the statutory authorities in connection with this Agreement.

iii. The successful bidder shall be solely responsible to pay all the statutory payments/dues, taxes and duties, royalties, revenue etc to statutory bodies and Nafed shall not in any manner, be responsible for payment of such dues on any of the items which is in the scope of this contract. The successful bidder shall also indemnify Nafed against payment of all such dues to statutory bodies and imposition of any penalty due to misuse or non-payment of any such dues or any other account whatsoever.

The successful bidder shall indemnify and keep indemnified Nafed against any loss / damage to any person/ property from any legal suit / claim filed on this account by any third party. The successful bidder will at all times abide by all safety procedures and rules as may be stipulated by local bodies/ Nafed from time to time.

iv. The successful bidder shall fully indemnify Nafed against any actions, claim related to design/ patent / trademark etc., and shall be solely responsible for payment of royalties etc. which may be payable for any item included in the contract.

v. The successful bidder shall indemnify and keep indemnified the Nafed against all losses and claims for injuries or damage to any persons or any property whatsoever which may arise out of or in consequence of the Demolition of existing godown, Construction and maintenance of works and against all claims, demands proceedings, damages costs, charges and expenses whatsoever in respect of or in relation thereto.

vi. The successful bidder agrees and undertakes to indemnify and keep indemnified Nafed harmless against any and all liabilities, Losses, damages, claims, expenses suffered by the Nafed as a result of any breach committed by him on this account.

vii. During the erection period, the successful bidder shall obtain temporary electricity connection for lighting of the pillars from SEB/ local electricity supply body. In such case the party shall indemnify Nafed from any liabilities arising out of non-payment of dues/ imposition of penalty/ any other charges due to SEB/ local electricity supply body and Nafed shall not in any manner be responsible for payment of such dues/ penalty etc.

viii. After completion of Scope of Erection and Installation of the Process Plant Machinery and Auxiliary Systems for the Honey Plant and before commencing the operations the selected bidder shall submit the details of plant and Machinery installed. The bidder shall also inform to Nafed about any additions in the plant and machinery made/installed beyond what is mentioned in the RFQ Document and the Agreement.

44. GENERAL OBLIGATIONS OF SUCCESSFUL BIDDER:

i. Successful Bidder shall keep and maintain the space in neat, clean condition and in safe & sound manner during all the time of agreement tenure. Any defective, weak or corroded material should be replaced immediately with new proper material after due certification from reputed Contractor. In case of any incident / injury caused due to error / omission attributable on the part of Contractor, the Contractor shall be responsible for all compensation.

ii. Successful bidder shall ensure that all persons employed behave in an orderly and disciplined manner and that the said employees are prohibited from carrying on any unlawful, unfair activities or demonstrations in Nafed premises. All the Contractor's personnel shall be required to possess ID card while working in Nafed's premises as per prevailing procedure.

iii. The rights to use the plot will be granted to the successful bidder on exclusivity basis. Nafed shall not engage any third party during the currency of period.

iv. Successful bidder shall comply with the laws of land including State Pollution Control Board guidelines. Nafed will not be held liable for any change/modification in the laws that adversely affect the contract agreement. Successful bidder shall have no right / claim in this regard, whatsoever the reason may be.

v. Successful bidder will not ask for any claim or seek any compensation from Nafed if advertisement at any advertisement space inside any premises is not permitted due to court order/local laws/civil authorities.

vi. Successful bidder hereby indemnifies Nafed against any loss, damage or liabilities arising as a result of any act of omission or commission on part of Contractor or on part of its personnel or in respect of non-observance of any statutory requirements or legal dues of any nature.

vii. Successful bidder undertakes to discharge all statutory obligations and liabilities in connection with employment of its personnel in the said premises. Contractor shall indemnify Nafed against any liability arising in connection with the employment of its personnel in the said premises by Contractor. Contractor hereby undertakes to carry out full compliance with Nafed's policies regulations prevalent at that time.

viii. Successful bidder undertakes that;

a) It shall not have or claim any interest in the said premises as a tenant/ sub-tenant or otherwise:

b) That no right as a tenant/sub-tenant or otherwise is purported or intended to be created or transferred by Nafed in favour of successful bidder in or in respect of the said plot, except to carry out their activities over the granted space in accordance to terms and conditions of tender; and

c) That the rights, which successful bidder shall have in relation to the said plot, will be only those set out in this tender/contract agreement.

45. NAFED'S RIGHTS IN RESPECT OF CONTRACT/AGREEMENT

i. Nafed shall not be liable for any omission, mistake or error in respect of any of the above or on account of any matter or thing arising out of or concerning or relating to or the Bidding Process, including any error or mistake therein or in any information or data given by Nafed

ii. Nafed, in its sole discretion and without incurring any obligation or liability, reserves the right, at any time, to; a. suspend and/ or cancel the Bidding Process and/ or amend and/ or supplement the Bidding Process or modify the dates or other terms and conditions relating thereto; consult with any Bidder in order to receive clarification or further information; retain any information and/ or evidence submitted to Nafed by, on behalf of, and/ or in relation to any Bidder; and/ or Independently verify, disqualify, reject and/ or accept any and all submissions or other information and / or evidence submitted by or on behalf of any Bidder.

iii. For repeated violation of instructions, breach of contract agreement, Nafed has the right to cancel the contract by giving Show Cause Notice at the risk and cost of the successful bidder including forfeiture of all amounts, non refundable security deposit included in favour of Nafed In case of any activity which can be deemed criminal, Nafed reserves the right to cancel the contract and forfeit all submissions including the non refundable security deposit in its favour with or without any notice.

iv. The Nafed reserves the right to accept or reject any tender. Authority for acceptance of the tender will rest solely with the Nafed, which does not bind itself to accept any tender and not to assign any reason for rejecting the same. Nafed reserves the right for deduction of the amount from non refundable security deposit which becomes liable to be paid on the following grounds:

a. Any amount which Nafed becomes liable to pay to the Government /Third party on behalf of any default of the successful bidder or any of his/her/their servant/agent/employees or staff.

b. Any payment/fine made under the order/judgment of any court/consumer forum or law enforcing Contractor or any person working on his behalf.

c. Once the amount under this clause is debited, the successful bidder shall recoup the security deposit to the extent the amount is debited within 15 DAYS of such debit by Nafed failing which it will be treated as breach of contract agreement and may lead to termination of agreement with forfeiture of all amounts including non refundable security deposit in favour of Nafed

46. CONFIDENTIALITY:

Information relating to the examination, clarification, evaluation, and recommendation for the Bidders shall not be disclosed to any person who is not officially concerned with the process or is not a retained professional advisor advising Nafed in relation to, or matters arising out of, or concerning the Bidding Process. Nafed shall treat all information, submitted as part of Bid, in confidence and shall require all those who have access to such material to treat the same in confidence. Nafed may not divulge any such information unless it is directed to do so by any statutory entity that has the power under law to require its disclosure or is to enforce or assert any right or privilege of the statutory entity and/ or Nafed or as may be required by law or in connection with any legal process.

47. APPLICABLE LAW JURISDICTION AND DISPUTE RESOLUTION:

This tender document along with its terms and conditions shall be governed by the India laws, both substantive and procedural, for the time being in force and shall be subject to the exclusive jurisdiction of New Delhi Court, if required.

Standards

The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications and when no applicable standard is mentioned, to the authoritative standards appropriate to the Goods' country of origin. Such standards shall be the latest issued by the concerned institution.

Country of Origin

i. All goods and services to be supplied and provided for the contract shall have the origin in India or in the countries with which the Government of India has trade relations.

ii. The word “origin” incorporated in this clause means the place from where the goods are mined, cultivated, grown, manufactured, produced or processed or from where the services are arranged.

iii. The country of origin may be specified in the Price Schedule

Use of Contract Documents and Information; Inspection and Audit by the NAFED

i. The Supplier shall not, without the NAFED's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern,

sample, or information furnished by or on behalf of the NAFED in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

ii. The Supplier shall not, without the NAFED's prior written consent, make use of any document or information enumerated cept for purposes of performing the Contract.

iii. Any document, other than the Contract itself, enumerated shall remain the property of the NAFED and shall be returned (all copies) to the NAFED on completion of the Supplier's performance under the Contract if so required by the NAFED.

47.5 Adjudicator:

i. If any dispute of any kind whatsoever shall arise between the purchase and the supplier in connection with or arising out of the contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity or termination, or the execution of the contract, whether during the progress of the execution or after their completion and whether before or after the termination, abandonment or breach of the contract, the parties shall seek to resolve any such dispute or difference by mutual consultation. If the parties fail to resolve such a dispute or difference by mutual consultation, then the dispute shall be referred in writing by either party to the adjudicator, with a copy to the other party.

ii. The Adjudicator shall give its decision in writing to both parties within twenty-eight (28) days of a dispute being referred to it. If the Adjudicator has done so, and no notice of intention to commence arbitration has been given by either the NAFED or the Supplier within fifty-six (56) days of such reference, the decision shall become final and binding upon the NAFED and the Supplier. Any decision that has become final and binding shall be implemented by the parties forthwith.

iii. The Adjudicator shall be paid a daily fee at the rate specified in the contract plus reasonable expenditures incurred in the execution of its duties as Adjudicator, and these costs shall be divided equally between the NAFED and the Supplier.

iv. Should the Adjudicator resign or die, or should the NAFED and the Supplier agree that the Adjudicator is not fulfilling its functions in accordance with the provisions of the Contract; a new Adjudicator shall be jointly appointed by the NAFED and the Supplier. Failing agreement between the two within twenty-eight (28) days, the new Adjudicator shall be appointed at the request of either party by the Appointing Authority specified in the contract.

45.6 APPLICABLE LAW JURISDICTION AND DISPUTE RESOLUTION:

i. This agreement shall be constituted and the legal relation between the parties hereto shall be determined and governed according to the laws of Republic of India and only courts at High Court of New Delhi shall have the jurisdiction in all matters arising out of / touching and/ or concerning this agreement and parties to this agreement agree to irrevocably submit to the exclusive jurisdiction of those courts for purposes of any such proceeding. The aforementioned exclusive and irrevocable jurisdictions of aforesaid courts are irrespective of place of occurrence of any cause of action pertaining to any dispute between the parties.

ii. All or any disputes arising or touching upon or in relation to the terms of this agreement including the interpretation and validity of the terms thereof and the respective rights and obligations of the parties shall be settled amicably by mutual discussion failing which the same shall be settled through arbitration. The arbitration proceedings shall be governed by the Arbitration and Conciliation Act of 1996 (as amended up to date) or any statutory amendments/modification thereof for the time being in force. The venue of the arbitration shall be at New Delhi, India and the language of arbitration shall be English.

48. MISCELLANEOUS:

i. The Bidding Process shall be governed by, and construed in accordance with, the laws of India and the Courts at New Delhi shall have exclusive jurisdiction over all disputes arising under, pursuant to and/ or in connection with the Bidding Process. **During the bidding process no dispute of any type would be entertained.** Even in such cases where Nafed asks for additional information from any bidder, the same cannot be adduced as a reason for citing any dispute. All disputes between the selected bidder and Nafed shall be settled as per the Dispute Resolution procedure elaborated in the Draft Agreement *after signing the Agreement.* The courts at New Delhi shall have the sole & exclusive jurisdiction to try all the cases arising out of this agreement.

ii. It shall be deemed that by submitting the Bid, the Bidder agrees and releases Nafed, its employees, agents and advisers, irrevocably, unconditionally, fully and finally from any and all liability for claims, losses, damages, costs, expenses or liabilities in any way related to or arising from the exercise of any rights and/ or performance of any obligations hereunder, pursuant hereto and/ or in connection with the Bidding Process and waives, to the fullest extent permitted by applicable laws, any and all rights and/ or claims it may have in this respect, whether actual or contingent, whether present or in future.

iii. The Agreement are to be taken as mutually explanatory and, unless otherwise expressly provided elsewhere in this , in the event of any conflict between them, the priority shall be in the following order:

a) Agreement
b) Document; i.e. the Agreement above shall prevail over tender document.

iv. In case of any correction/addition/alteration/omission in the tender document observed at any stage, the bid shall be treated as non-responsive and shall be rejected.

49. EVALUATION PROCEDURE

Tender will be evaluated in following manner:

i. The tender will be evaluated on Pre-qualification eligibility criteria as laid down in the Tender documents.

ii. With regard to the matching of technical specifications of individual equipment., a deviation up to ±10% can be considered by the NAFED on the recommendation of the Consultant without compromising with the quality and its major functioning.

iii. Those agencies who will be found eligible in the above two steps, will be called for presentation before duly constituted Technical Evaluation Committee by Nafed on the date and time, as prescribed by the committee. The eligible agencies will be called through email only. The presentation round shall be of 25 marks. The

presentation may contain equipment photo, equipment designs, specifications, imported or indigenous, methodology of working/supply, timeline schedule of supply, after sales service, etc. In case of manufacturer the actual photos of manufacturing unit may be enclosed. In case of importer, copy of dealership/distributor/authorization to supply in India, copy of Import License, etc. are to be enclosed. Any other aspect regarding agency profile, equipment, etc. The presentation round will be assessed on following parameters:

S.No.	Criterion	Max. Marks
1	Experience in Manufacturing or supply of Food Processing Equipment or providing turnkey/ EPC services for food processing lines. One mark for each completed year. (Enclose Registration & Appropriate other document.)	10
2	Financial turnover of bidder (for 2019-20) i. 5 Marks for 5 Cr ii. 10 marks for 6 Cr to 10 Cr	25
	iii. 15 marks for 10 Cr to 15 Cr iv. 20 marks for 15 Cr to 25 Cr. v. 25 marks for above 25 Cr. Enclose C.A. Certificate & Balance sheet	
3	Successfully completed assignment during last 3 years in last three years ,the bidder should have completed at least one job orders valued at Rs.5.00 Crores (8marks each) or three jobs of Rs.2.00 Crores (4 marks each) or five job orders of Rs.1.00 Crore (2 mark each) in the relevant field of application.	25
4	Having supplied equipments to Honey Processing Plants 3 marks each for every Rs.1.00 Crore purchase order	15
5	Presentation	25
	Total	**100**

iv. Marks other than presentation shall be given on the basis of documents submitted by the bidding agencies and shall be communicated to all the agencies either through email or uploaded on NAFED website. However, marks of presentation, will be assigned during the presentation round by Technical Bid Evaluation Committee and will also be uploaded or communicated through email to all the successful agencies. The financial bids shall only be opened to those agencies, who will score minimum 50 marks, out of 100 marks and fulfilling of other eligibility, terms and conditions of the tender, on the date and time, as published on the NAFED website / portal. Before, opening of financial bid, the result of presentation as well as technical evaluation will be either uploaded or communicated through mail.

50. FINANCIAL BID EVALUATION

The bid of agency quoting lowest for the overall turnkey execution as per the scope of work in their financial bid i.e. L-1 bidder will be awarded 100 points and other bidders will be discounted in percentage proportion and awarded points accordingly. (for Example suppose LI has quoted Rs.5.00 Crore and L2 has quoted Rs.6.00 Crore, the L1 would be awarded 100 points and L2 will get (100 – (600-500/500)) = 80 points).

51. SELECTED BID

The bidder whose bid gets highest marks out of 200 shall be decelared **"Provisionally Selected Vendor"**

Acceptance of tender will be intimated to the successful tenderer / bidder signed by the authorized signatory. Contract / Agreement, will be signed with the successful bidder after issue of Letter of Award and receipt of Letter of Acceptance from the successful bidder

52. EVALUATION SHEET

To be filled by the tenderer, which will be verified by the Bid Evaluation Committee/ Technical Evaluation Committee:

S.No.	Criteria	Max. Marks	Marks claimed by the Tenderer	Marks verifiedby the Committee	Page No. Proof
1	Experience in Manufacturing or supply of Food Processing Equipment or providing turnkey/ EPC services for food processing lines. One mark for each completed year. (Enclose Registration & Appropriate other document.)	10			
2	Financial turnover of bidder (for 2019-20) i.5 Marks for 5 Cr ii.10 marks for 6 Cr to 10 Cr, iii.15 marks for 10 Cr to 15 Cr iv.20 marks for 15 Cr to 25 Cr. 25 marks for above 25 Cr. Enclose C.A. Certificate & Balance sheet	25			

3	Successfully completed assignment in last three years ,the bidder should have completed at least one job orders valued at Rs.5.00 Crores (8marks each) or three jobs of Rs.2.00 Crores (4 marks each) or five job orders of Rs.1.00 Crore (2 mark each) in the relevant field of application.	25			
4	Having supplied equipments to Honey Processing Plants 3 marks each for every Rs.1.00 Crore purchase order	15			

53. HOLIDAY LISTING

The vendors / contractors are expected to adopt the ethics of highest standards and a very high degree of integrity, safety and quality consciousness, commitment and sincerity towards the work undertaken and dealing with NAFED in such matters. Also, while participating in the tender and performing the contracts, Contractors are required to meet certain performance criteria and adherence to the terms and conditions of the tender / contract. NAFED shall have the right to remove from the list of approved suppliers / contractors or to ban business dealings, if any agency has been found to have committed misconduct or fraud or poor performance or anything unethical not expected from a reputed agency. The guidelines and procedures for Holiday Listing as adopted by NAFED and available separately in NAFED website shall be applicable in the context of all tenders floated and consequently, all Orders / Contracts / Purchase Orders placed, by NAFED. NAFED Holiday Listing Policy is also available on the NAFED Website under Tenders Section.

54. INTEGRITY PACT

National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED), an apex level Co-operative Marketing Federation, registered under the provisions of Multi State Cooperative Societies Act, 2002 (as amended up to date), having its Head Office at NAFED House, Siddhartha Enclave, Ashram Chowk, New Delhi-110014 through ..... (hereinafter referred to as the "The Principal", as the context may require or admit, which expression shall, unless excluded by or repugnant to the subject or context or meaning thereof, be deemed to mean and include its representatives, nominees, affiliates, successors and permitted assigns) of the ONE PART And
And

.....a society/FPO/company incorporated under the.....or Partnership Firm duly registered vide Deed of Partnership dated .....or Proprietorship Firm, through its Director/Partner/Proprietor Mr./Mrs._____and having its registered office at_____(hereinafter referred to as

"Vendor/Bidder/Contractor") which expression shall, unless repugnant or contrary to the context or meaning thereof, be deemed to mean and include its successors, authorized signatories and permitted assigns) of the OTHER PART .....,

PREAMBLE

A. The Principal intends to award, under laid down organizational procedures, contract/s for ..... The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and/or Agency.

Article: 1- Commitments of the Principal

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

a) No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand; take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

b) The Principal will, during the tender process treat all Bidder (s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an unfair advantage in relation to the tender process or the contract execution.

c) The Principal will exclude from the process all known prejudiced persons.

2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Article: 2 – Commitments of the Bidders(s)/Contractor(s)

1. The Bidder(s)/Contractor(s)/Vendor(s) commit themselves to take all measures necessary to prevent corruption. The Bidder(s)/Contractor(s) /Vendor(s) commit themselves to observe the following principles while participating in the tender process and during the contract execution.

a) The Bidder(s)/Contractor(s)/Vendor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

b) The Bidder(s)/Contractor(s)/Vendor(s) will not enter with other Bidders into any undisclosed agreements or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.

c) The Bidder(s)/Contractor(s)/Vendor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s)/Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business

relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder(s)/Contractor(s)/Vendor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details of Indian Agents of Foreign Suppliers shall be disclosed by the Bidder(s)/Contractor(s)/Vendors. Further, all the payments made to the Indian agent/representative have to be in Indian Rupees only.

e) The Bidder(s)/Contractor(s)/Vendor(s) while presenting their bid, will disclose any and all payments made, are committed to or intend to make to agents, brokers or any other intermediaries in connection with the award of the contract.

f) Bidder(s)/Contractor(s)/ Vendor(s) who have signed the Integrity Pact shall not approach the Courts while representing the matter to IEMs and shall wait for their decision in the matter.

2. The Bidder(s)/Contractor(s)/Vendor(s) will not instigate their persons to commit offences outlined above or be an accessory to such offences.

Article: 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s)/Vendor(s), before award or during execution has committed a transgression through a violation of Article 2, above or in any other form such as to put their reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take action as per the laid down procedure.

Article: 4- Compensation for Damages

1. If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Article 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.
2. If the Principal has terminated the contract according to Article 3, or if the Principal is entitled to terminate the contract according to Article 3, the Principal shall be entitled to demand and recover from the Contractor/vendor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

Article: 5 – Previous transgression

1. The Bidder declares that no previous transgressions occurred in the last three years with any other firm/Company/organization in any country conforming to the anti-corruption approach or with any Public Sector Enterprise in India that could justify its exclusion from the tender process.

2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken as per the procedure mentioned in "Guidelines on Banking of business dealings".

Article: 6-Equal treatment of all Bidders / Contractors /Subcontractors

1. In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Subcontractor.
2. The principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Article: 7 - Criminal charges against violating Bidder(s) / Contractor(s) / Subcontractor(s) If the Principal obtains knowledge of conduct of a Bidder, Contractor or subcontractor, or if an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

Article: 8 - Independent External Monitor

1. The Principal appoints competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
2. The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all Contract documents, whenever required. It will be obligatory to him /her to treat the information and documents of the Bidders / Contractors as confidential. He /she will report to the Managing Director, NAFED.
3. The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor will also grant the Monitor, upon his/her request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same is also applicable to Sub- contractors.
4. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Sub-contractor(s) with confidentiality. The Monitor has also signed declarations on 'Non- Disclosure of confidential Information' and of 'Absence of Conflict of interest '. In case of any conflict of interest arising out at a later date, IEM shall inform the Managing Director, NAFED and recues himself/herself from that case.
5. The Principal will provide to the Monitor sufficient information about all the meetings among the parties related to the Project provided such meetings could have any impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
6. As soon as the Monitor notices, or believes to notice, violation of this agreement, he/she will so inform the management to discontinue or take corrective action, or to take relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
7. The Monitor will submit a written report to the Managing Director, NAFED within 8 to 10 weeks from the date of reference or intimations to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
8. If the Monitor has reported to the Managing Director, NAFED, a substantiated suspicion of an offence under relevant IPC/PC Act, and the Managing Director, NAFED has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioners.
9. The word "Monitor" would include both singular and plural.

Article: 9 – Pact Duration

1. This pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded. Any violation of the same

would entail disqualification of the bidders and exclusion from future business dealings.

2. If any claim is made/lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by the Managing Director, NAFED.

Article: 10 – Other provisions

1. This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi.
2. Changes and supplements as well as termination notices need to be made in writing.
3. If the contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
4. Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
5. Issues like Warranty/Guarantee etc. shall be outside the purview of IEMs.
6. In the event of any contradiction between the Integrity Pact and its Annexure, the Clause in the Integrity Pact will prevail.

_____ _____

(For & on behalf of the Principal) (For & on behalf of Bidder/Contractor)

(Office Seal) (Office Seal)

Place: _____

Date _____

Witness 1:

(Name & Address) _____

_____

_____

_____

Witness 2:

(Name & Address) _____

_____

_____

****

END OF RFQ DOCUMENT

NAFED

INDEX OF

TECHNICAL SPECIFCATIONS SHEETS

NAFED

TECHNICAL SPECIFICATIONS

&

SCHEDULE OF QUANTITIES FOR

CIVIL WORKS

*****NOTE -: QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.**

NAFED

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GENERAL INFORMATION

A. GENERAL: The work under this tender shall be executed strictly in accordance with constructional and material requirements defined under these specifications. The Contractor shall carefully acquaint himself with these specifications to determine his contractual obligations for the work. The conditions of these specifications will be binding on the Contractor and no deviation shall be permissible unless specifically approved by the Consultant / Project-in-charge in writing. In absence of any detailed Specifications these specification, latest Indian Standard specifications and code of practice shall become applicable. Wherever the codes and specifications are silent then the same shall be governed by sound engineering practices and the decision of the Project-in-charge / consultant in matters of interpretation etc., shall be final and binding on the Contractor.

B. DRAWINGS / DIMENSIONS:

Figured dimensions on drawings shall supersede measurements by scale and drawings to a large scale take precedence over those to a smaller scale. Special dimensions or directions in the specifications shall be checked on site. Measurements and other information concerning the existing site on the drawings are believed to be correct, but the Contractor shall verify them for himself and also examine the nature of the ground as no claim or allowance whatsoever shall be entertained hereinafter on account of any errors or omissions in the levels or the description of the ground turning out to be different from what was expected or shown on the drawings.

C. CORRELATION OF DRAWING:

Before commencement of work, the Contractor shall correlate all relevant structural, Construction and services drawings and satisfy himself that the information available is complete and unambiguous. The Contractor shall be responsible for any error / difficulty in execution / damage incurred owing to any discrepancy in the drawings which has been overlooked by him and has not been brought to the notice of the Project-in-charge / Consultant before execution.

D. B.I.S CODES OF PRACTICE:

Wherever any reference is made in the specifications to **any bureau of Indian Standard (IS)** code of practice, it shall be understood to indicate the latest version of the code of practice in usage at the time of construction.

E. ALL SIMILAR RATES TO HAVE SAME QUOTED RATE

It shall be noted by the bidder that a similar item repeated at various sub heads of the tender, he should quote same rates. For any reasons different rates are quoted the lowest rate shall be considered for deriving the substituted / extra item rate if required.

SPECIFICATIONS

SPECIFICATIONS FOR EXCAVATION AND EARTHWORK

SCOPE

The scope of work broadly includes but is not necessarily limited to the following i.e. clearing of the site, excavation of foundation trenches, back-filling, disposal of surplus earth as required including dewatering, shoring and strutting. Contractor shall provide all tools, labour, equipment and incidentals necessary, required for completion of all aspects of work covered in these specifications.

TYPES OF SOIL

Contractor shall thoroughly acquaint himself with the types of soil in excavation by an inspection of nature of the ground at site & scrutiny of the investigation details available with the Consultant.

GROUND LEVELS AND SITE LEVEL PLAN

Before starting the excavations, the requisite block levels of the entire plot shall be taken by the contractor in

consultation with the Consultant and a proper record of these levels to be kept, which shall be jointly signed by the Contractor and the Consultant. A block level plan showing-all the ground levels of the plot shall be prepared and shall jointly be signed by the Contractor and the Consultant/Project-in-charge.

SETTING OUT

After clearing the site, and preparing the site level plan, the Contractor will set out the center lines of the building or other involved works and get the same approved from the Consultant. It shall be the responsibility of the Contractor to install substantial reference marks; bench marks etc. and maintain them as long as required by the Consultant. The Contractor will assume full responsibility for proper setting out, alignment, elevation and dimension of each and all parts of thework

EXCAVATION AND PREPARATION OF FOUNDATIONS FOR CONCRETING

The contractor shall, at his expense and without any extra charge, make provision for all shoring and strutting, extra excavation in slope, extra excavation in working space, dredging or bailing out water, and the excavation shall be kept free from water when the foundation work is in progress.
If excavation is carried out to greater width, length or depth than specified, extra depth shall be made up by filling in lean concrete and extra length or width by filling in with earth rammed hard or by masonry as shall be borne in full by the contractor.

If required to protect the sides of pits and trenches, timber shoring and strutting shall be erected. The timbering shall be closed or open depending on the nature of the soil and work, and arrangement of timbering including sizes and spacing of members used shall be as approved by the Consultant. NO extra charges shall be admissible on this account.

The bottoms of all excavation shall be trimmed and leveled in accordance with drawings / directions of the Consultant / Project-in-charge. The bottoms of all excavation shall be rammed and wetted before deposition of concrete. The contractors shall report to the Consultant / Project-in-charge when the excavation is ready to receive concrete. NO concrete shall be placed in foundations until the contractor has obtained the approval of Consultant / Project-in-charge.

PROTECTION

All foundation trenches and similar excavations shall be strong, fenced and marked with red lights at night for watchmen to avoid accidents. Adequate protective measures shall be taken to see that the excavation does not affect or damage adjoining structures. All measures required for the safety of the excavation, the people working in and near the foundation trenches, property and the people in the vicinity shall be taken care by the Contractor at his own cost, being entirely responsible for any injury and damage to property caused by his negligence or accident due to his construction operations.

STACKING OF EXCAVATED MATERIALS:

Work for excavation shall include sorting out of useful materials and stacking them on site as directed. Materials suitable and useful for back-filling, plinth, filling, leveling of the plot or other use shall be stacked at convenient places, but not in such a way as to obstruct free movement of men, equipment and vehicles or encroach on the area required for constructional purposes.

COMPACTION

The fill shall be spread in layers not exceeding 20 cm thick and each layer shall be watered and thoroughly consolidated by suitable mechanical rollers, rammers, vibrators or other approved plant or system of compaction.

1. SPECIFICATION FOR CAST – IN – SITU REINFORCED CEMENT CONCRETE

GENERAL

This section covers the requirements for finishing of cement concrete, proportioning, batching, mixing, testing, placing, compacting, finishing, jointing, curing and all other work as required for cast in place reinforced concrete. The contractor shall provide all the materials including cement,

steel, labour, equipment, 'form work', scaffolding etc., required for completion of all reinforced concrete works as per drawings and documents. Cement concrete shall be composed of cement, fine aggregate, coarse aggregate, water, with or without admixture as approved, proportioned and mixed as specified herein.

SUBMITTALS

Material Report
Prior to start of delivery of materials required, the following shall be submitted by the contractor to the Consultant / Project-in-charge for approval

Suppliers and / or sources of all consumable materials including cement, steel, fine and coarse aggregates, water additives, bricks and timber etc.

Quality Inspection Plan to ensure continuing quality control of ingredients by periodic sampling, testing and reporting to the Consultant on the quality of materials being supplied.

PLANT AND EQUIPMENT

The contractor shall submit the following to the Consultant well in advance.
The proposed program, methods and details of plant and Equipment for be used to testing of ingredients and concrete samples.
Details of plant & equipment to be used for concrete work.

REPORTS FOR INSPECTION AND TESTING

During concreting operations, the contractor shall conduct inspection and testing as described under the list of mandatory tests in this volume and all reports thereon shall be submitted in summary form to the Consultant / Project-in-charge.

MATERIALS

Before bringing to the site, all materials for cement concrete shall be approved by the Consultant / Project-in-charge. All approved samples shall be deposited in the office of the Consultant / Engineer-in charge before placing orders for the materials with suppliers The materials brought on to the work shall conform in every respect to their approved samples.

Fresh samples shall be deposited with the Consultant / Project-in-charge whenever type or source of any material changes The contractor shall check each fresh consignment of materials as it is brought on to the works to ensure that they conform to the specification and / or approved samples.

The Consultant / Project-in-charge shall have the option to have any of the materials tested to find whether they are in accordance with specifications at the contractor 's expense. All bills vouchers and test certificates which in the opinion of the Consultant / Project-in-charge are necessary to convince him as to the quality of materials or their suitability shall be produced for his inspection when required.

Any materials which have not been found to the specification and not approved by the Consultant / Project- in-charge shall be rejected forthwith and shall be removed from the site by the Contractor's at his own cost within the time stipulated by the Consultant / Project-in-charge. The Consultant / Project-in-charge shall have the powers to cause the contractors to purchase and use materials from any particular source, as may in their opinion be necessary for the proper execution of work.

CEMENT

Cement at site shall be stored in dry weather proof go-downs (or shed) built by the Contractor at his own costs in stacks which are not higher than 10 bags. The cement go-down shall be constructed as per CPWD specifications.

NAFED

AGGREGATES

Aggregates from natural sources shall be in accordance with IS: 383. The contractor shall submit to the Consultant / Project-in-charge certificates of grading and compliance from the suppliers for all consignments of aggregate. In addition at site from time to time, the contractor shall test the aggregates in accordance with IS: 2386 parts I, II, III and IV. The contractor shall allow for and provide all necessary apparatus for carrying out each test and for supplying test records to the Consultant.

COARSE AGGREGATE

The coarse aggregate shall be crushed stone or broken stone. Coarse aggregate obtained from crushed or broken stone shall be angular, hay, strong, dense, durable clean and free from soft, friable, thin, flat, elongated flaky pieces. The coarse aggregate should be from the approved source/quarry. Coarse aggregate River shingle or pit gravel shall be rounded, sound hard, clean, non porous, suitably graded in size with or without broken fragments and free from flat particle of shale, clay, silt, loam and other impurities.

The maximum size of coarse aggregate shall be such that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and fill the corners of form work.

WATER

Water used in the works shall be potable water and free from deleterious materials. Water used for mixing and curing concrete as well as for cooling and/or washing aggregate shall be fresh and clean, free from injurious amounts of oil, salts, acids, alkali, other chemicals and organic matter.

Water shall be from the source approved by the Consultant / Project-in-charge and shall be in accordance with Clause 4.3 of IS: 456.

ADMIXTURES AND ADDITIVES

Chemical admixtures are not to be used until permitted by the Consultant/Project-in-charge in case their use is permitted, the type, amount and method of use of any admixture proposed by the contractor shall be submitted to the Consultant for approval

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GRADES OF CONCRETE

The grades of concrete shall be in accordance with the following table. The grade of concrete to be used in each section of work will be shown in the drawings.

Contractor of his responsibility to produce concrete having compressive strengths as laid down in the foregoing table. The Engineer shall have authority at any time to check whether the mixing of concrete is being carried out according to the approved proportions.

For the major and important RCC works and for all special works, the design of mixes shall be made by the Contractor at his own cost, for each grade of concrete. The design of mixes shall be made according to relevant I.S. codes or to approved standard methods.
The concrete made by designing the mix is termed hereinafter as "Design Mix Concrete".

Moulds shall be prepared by the Contractor. The slump range of concrete shall be as per the tabulation given below, as well as standards.
Slump tests shall be performed as per IS: 1881 at intervals established by the Engineer at the Contractor's cost in such a way as to check that the degree of consistency established by the Engineer for work in progress is maintained.

Any solid admixture, to be added, shall be measured by weight, but liquid or semi-liquid admixture may be measured by weight or volume.
The Bidder shall indicate the brand name, the Manufacturer and the properties of any admixture to be used for the concrete as per Bill of Quantity items or on his own initiative.

MIXING OF CONCRETE

Machine Mixing

Concrete shall always be mixed in mechanical mixer. Water shall not, normally, be charged into the drum of the mixer until all other ingredients are already in the drum and mixed for at least one minute. Mixing shall be continued until there is uniform distribution of materials and the mass is uniform in colour and consistency. The mixing time from the time of adding water shall be in accordance with IS 1791, but in no case less than 2 minutes or at least 40 revolutions.

Placing and Compaction of Concrete

Before placing the concrete, the Contractor shall ensure that:

1. All mixing and placing equipment is thoroughly cleaned
2. All concreting space is free from debris and rubbish
3. All forms have been thoroughly wetted or oiled and firmly installed in line and plumb to the Engineer's approval.
4. All reinforcement is cleaned of loose rust, scales and other injurious adherents and is firmly bound and correctly placed and has been so approved by the Engineer.
5. All inserts, sleeves, foundation bolts and embedded parts have been correctly and firmly installed to confirm to the Engineer's drawings and have been carefully checked to comply with the drawings. Special care shall be taken to locate and check sleeves or inserts, which may not be symmetrically placed with respect to centre lines.

The Contractor and Engineer shall separately inspect and check the above mentioned points and record and sign the results in a register which shall be maintained by the Contractor in a approved form. No concrete shall be placed without the Engineer having inspected and approved in writing. In spite of ensuring the above requirements, the Contractor shall fill pour cards furnishing the necessary details of the job, duly signed by the Engineer. This, however, will not absolve the Contractor from his responsibility to correctly execute the work.

CURING OF CONCRETE

General

The purpose of curing is either to provide sufficient water at optimum temperature or to prevent loss of moisture from the concrete itself so that the cement inside the concrete is sufficiently hydrated which, of course, is a slow and prolonged process. As soon as the concrete has hardened sufficiently, the curing shall be started.

Strength Test of Concrete

While placing concrete, the Contractor shall make 150 mm test cubes from particular batches of concrete.
The frequency of taking test cubes shall be either according to clause 14.2 of IS: 456 or as directed by the Engineer.

Cubes shall be tested for compressive strength at 7 days after casting and 28 days after casting. A register shall be maintained at site by the Contractor with the following details entered and signed by both the Contractor

and the Engineer. That register shall be considered as the property of EMPLOYER,
a) Reference to the specific structural member
b) Mark on cubes
c) The grade of concrete
d) The mix of concrete
e) Date and time
f) Crushing strength at 7 days
g) Crushing strength at 28 days
h) Any other information directed bythe Engineer.

ACCEPTANCE CRITERIA FOR TEST CUBES

The acceptance criteria of concrete on strength requirement shall be in accordance with the stipulations under clause 15 of IS: 456.

Non-destructive Tests on Hardened Concrete

If there is doubt about the strength or quality of a particular work or the test results do not comply with the acceptance criteria as stipulated under clause 15 of IS: 456, non-destructive tests on hardened concrete like core tests and/or load tests or other type of non destructive tests like ultrasonic impulse test etc. shall be carried out, as may be directed by the Engineer, by the Contractor at entirely his own cost.

The core tests and load tests shall comply with the requirements of clause 16.6 of IS: 456.

Concrete below Specified Strength

In case of failure of test cubes to meet the specified requirements, the Engineer may take one of the following actions:
1. Reject the work and instruct that section of the works to which the failed cubes relate shall be cut out and replaced at the Contractor'sexpense.
2. Instruct the Contractor to carry out additional tests and/or works to ensure the soundness of the structure at the Contractor's expense.
3. Accept the work with reduction in the rate in appropriateitem.

EXPANSION JOINTS

GENERAL

Expansion joints shall be provided where shown on the drawings or as directed by Consultant. They shall be constructed with an initial gap between the adjoining parts of the works of the width specified in the drawings.
The contractor shall ensure that no debris is allowed to enter expansion joints Expansion joints shall be provided as per drawings. Contractor shall ensure that expansion joints are made water-tight and that no leakage occurs through these joints for which he shall be responsible to redo at his own cost.

SUPERVISION

All concreting work shall be done under strict supervision of the qualified and experienced representatives of the Contractor as well as those of the Consultant. The contractor’s Engineer and supervisor who are in charge of concreting work shall be skilled in this class of work and shall personally supervise all the concreting operations.

COVER TO REINFORCEMENT

Unless shown otherwise on the drawings, minimum cover for all reinforcement shall be provided as per IS: 456 & care shall be taken to maintain the correct cover to reinforcement.

NAFED

CLEANING

After placing, the reinforcement shall be maintained in a clean condition until the concrete is placed. On no account the bars shall be oiled or painted or mould oil used on the formwork be allowed to come in contact with the bars.
Before concreting is commenced, the bars shall be thoroughly cleaned with dry gunny bags if they are coated lightly with rust or other impurities.

SPECIFICATIONS FOR BRICK MASONRY WORK:-

SCOPE:-

The Contractor shall provide all labour, materials, scaffolding operations, equipment and incidentals necessary required for the completion of all brickwork called for in the drawings and documents and that which is fairly intended for smooth completion of the work.
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MORTARS:-

All brick work shall laid with specified mortar of good workable consistency.

SOAKING OF BRICKS:-

All bricks required for masonry in cement or composite lime mortars shall be thoroughly soaked in clean water for at least one hour in advance of sufficient quantity size for immediate use. The cessation of bubbles when the bricks are immersed in water is an indication of thorough soaking of bricks.

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

NAFED

SUMMARY					
S.No.	**Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1	Civil Work of Main Building Shed	Nos.	1.00		
2	Construction of Cable Trench	Nos.	1.00		
3	Construction of Drain	Nos.	1.00		
4	Construction of Guard Room	Nos.	1.00		
5	Construction of Meter Room	Nos.	1.00		
6	Construction of overhead structure	Nos.	1.00		
7	Construction of Toilet & Septic Tank	Nos.	1.00		
8	Construction of Foundations for DG, Transformer & Boiler	Nos.	1.00		
			Total		
ADDITIONAL ITEMS					
9	Supplying, installation, testing & commissioning of STP/ETP of appropriate technology including civil works (except plant room) tertiary treatment etc. for the campus	KLD	20.00		
10	Underground Water storage tank for Fire usage	Ltr.	50000.00		
11	Construction of outside roads	Nos.	1.00		
12	Construction of Boundary Wall	Nos.	1.00		
			Total		

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

NAFED

BOQ FOR MAIN SHED CIVIL WORK					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1 (a)	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	995.97		
1 (b)	Extra for excavating trenches for pipes, cables etc. in all kinds of soil for depth exceeding 1.5 m, but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 metre).	Cum.	335.87		
1 (c)	Extra for excavating trenches for pipes, cables, etc, in all kinds of soil for depth exceeding 3 m in depth, but not exceeding 4.5 m. (Rate is over corresponding basic item for depth upto 1.5 metre.)	Cum.	0.00		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	842.43		
3	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	Cum.	308.75		
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	162.22		

5	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	346.62		
6 (a)	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete	Sqm.	118.08		
6 (b)	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	Sqm.	247.95		
6 (c)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm.	311.60		
6 (d)	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm.	121.42		
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	KG	18108.13		
8	Only fixing of bolts in proper level & layout with proper shuttering, supports, welding for PEB structure (Shuttering, Steel & RCC will be paid in respective items)	Nos.	246.00		
9	Providing & Laying GP-2 below PEB column base plate after clearnace from PEB contractor & Client in required line , level & depth of approved brand	Cum.	0.60		
10	Providing & mixing of Steel fibre (Novocone Xerox 1050) 15KG/Cum. , Glass Fibre 1KG/Cum And Fibre mesh 300E3, as per manufacturer specification	KG	3132.36		
11	Providing & applying floor hardner of approved make at 4KG/Sqm.	Sqm.	1050.00		

12	Providing & applying Lithium Silicate coating over RCC Floor as per specifications	Sqm.	1050.00		
13	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in Cement mortar 1:4(1 cement : 4 coarse sand)	Cum	27.21		
14	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm.	236.60		
15	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work	Sqm.	236.60		
16	100 MM. AAC Panel Partition work	Sqm.	225.00		
17	False ceiling	Sqm.	200.00		
18	Excavating, supplying and filling of local earth (including royalty) by mechanical transport upto a lead of 5km also including ramming and watering of the earth in layers not exceeding 20 cm in trenches, plinth, sides of foundation etc. complete.	Cum	920.78		
				Total	

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

NAFED

BOQ FOR CABLE TRENCH					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	10.00		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	5.88		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	1.88		
4	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	6.00		

5 (a)	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete	Sqm.	20.00		
5 (b)	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	Sqm.	80.00		
6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	KG	435.00		
7	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	KG	546.81		
			Grand Total		

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

NAFED

BOQ FOR DRAIN WORK					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1 (a)	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	182.70		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	85.50		
3	1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	Cum.	24.30		
4	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in Cement mortar 1:4(1 cement : 4 coarse sand)	Cum	72.90		
5	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm.	370.80		
6	Extra for providing and mixing water proofing material in cement per bag of plaster work in proportion recommended by the manufacturers.	Sqm.	370.80		
			Grand Total		

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

NAFED

BOQ FOR GUARD ROOM					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1 (a)	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	95.96		
1 (b)	Extra for excavating trenches for pipes, cables etc. in all kinds of soil for depth exceeding 1.5 m, but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 metre).	Cum.	32.77		
1 (c)	Extra for excavating trenches for pipes, cables, etc, in all kinds of soil for depth exceeding 3 m in depth, but not exceeding 4.5 m. (Rate is over corresponding basic item for depth upto 1.5 metre.)	Cum.	0.00		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	83.28		
3	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	Cum.	5.93		
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	3.26		
5	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	12.27		

6 (a)	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete	Sqm.	11.52		
6 (b)	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	Sqm.	7.20		
6 (c)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm.	32.12		
6 (d)	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm.	18.95		
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	KG	1166.37		
8	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in Cement mortar 1:4(1 cement : 4 coarse sand)	Cum	6.02		
9	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm.	81.00		
10	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work	Sqm.	81.00		
11	Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thickclear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete.	Sqm.	4.77		
			Grand Total		

NAFED

BOQ FOR METER ROOM					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1 (a)	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	95.96		
1 (b)	Extra for excavating trenches for pipes, cables etc. in all kinds of soil for depth exceeding 1.5 m, but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 metre).	Cum.	32.77		
1 (c)	Extra for excavating trenches for pipes, cables, etc, in all kinds of soil for depth exceeding 3 m in depth, but not exceeding 4.5 m. (Rate is over corresponding basic item for depth upto 1.5 metre.)	Cum.	0.00		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	83.05		
3	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	Cum.	5.93		
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	3.26		
5	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	13.07		

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6 (a)	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete	Sqm.	11.52		
6 (b)	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	Sqm.	7.20		
6 (c)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm.	28.14		
6 (d)	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm.	29.52		
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	KG	959.47		
8	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in Cement mortar 1:4(1 cement : 4 coarse sand)	Cum	10.71		
9	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm.	112.68		
10	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work	Sqm.	112.68		
11	Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thickclear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete.k	Sqm.	3.15		
			Grand Total		

NAFED

BOQ FOR OVERHEAD STRUCTURE					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1 (a)	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	93.99		
1 (b)	Extra for excavating trenches for pipes, cables etc. in all kinds of soil for depth exceeding 1.5 m, but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 metre).	Cum.	14.09		
1 (c)	Extra for excavating trenches for pipes, cables, etc, in all kinds of soil for depth exceeding 3 m in depth, but not exceeding 4.5 m. (Rate is over corresponding basic item for depth upto 1.5 metre.)	Cum.	0.00		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	81.06		
3	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	Cum.	4.20		
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	1.94		

5	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	6.97		
6 (a)	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete	Sqm.	11.66		
6 (b)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm.	12.15		
6 (c)	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm.	11.76		
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	KG	431.88		
8	Only fixing of bolts in proper level & layout with proper shuttering, supports, welding for PEB structure (Shuttering, Steel & RCC will be paid in respective items)	Nos.	24.00		
9	Providing & Laying GP-2 below PEB column base plate after clearnace from PEB contractor & Client in required line , level & depth of approved brand	Cum.	0.03		
10	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	KG	6032.40		
11	2 coats of synthetic enamel paint of approved make on MS Structure as per standard norms	KG	6032.40		
12	Providing, Fixing & painting of 1 m. high MS Railing of approved make as per design	m.	18.00		
			Grand Total		

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

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BOQ FOR TOILET					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1 (a)	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	97.34		
1 (b)	Extra for excavating trenches for pipes, cables etc. in all kinds of soil for depth exceeding 1.5 m, but not exceeding 3 m. (Rate is over corresponding basic item for depth upto 1.5 metre).	Cum.	32.77		
1 (c)	Extra for excavating trenches for pipes, cables, etc, in all kinds of soil for depth exceeding 3 m in depth, but not exceeding 4.5 m. (Rate is over corresponding basic item for depth upto 1.5 metre.)	Cum.	0.00		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	84.00		
3	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	Cum.	9.06		
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	5.32		

5	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	16.27		
6 (a)	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete	Sqm.	11.52		
6 (b)	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	Sqm.	12.84		
6 (c)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm.	69.27		
6 (d)	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm.	18.95		
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	KG	1148.85		
8	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in Cement mortar 1:4(1 cement : 4 coarse sand)	Cum	19.24		
9	12 mm cement plaster of mix : 1:4 (1 cement: 4 fine sand)	Sqm.	195.09		
10	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work	Sqm.	195.09		

11	Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thickclear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete.	Sqm.	13.23		
12	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/sqm including pointing the joints with white cement and matching pigment etc., complete.	Sqm.	44.92		
13	Providing Septic tank for Toilet	Nos.	1.00		
14	Sanitary & Inside Plumbing Work	Nos.	1.00		
			Grand Total		

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

NAFED

BOQ FOR ROAD WORK					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	459.00		
2	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	Cum.	408.00		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	87.00		
4	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	130.50		
5	Centering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, bases of columns, etc. for mass concrete	Sqm.	36.25		
6	Providing & mixing of Steel fibre (Novocone Xerox 1050) 15KG/Cum. And Fibre mesh 300E3, as per manufacturer specification	Cum.	1957.50		
			Grand Total		

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

NAFED

BOQ FOR BOUNDARY WALL					
S.No.	**Item Description**	**Unit**	**Qty.**	**Rate**	**Amount**
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	Cum.	257.40		
2	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	Cum.	167.22		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	Cum.	11.70		
4	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Concrete of M25 grade with minimum cement content of 330 kg /cum	Cum.	4.91		

6 (a)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	Sqm.	26.00		
6 (b)	Columns, Pillars, Piers, Abutments, Posts and Struts	Sqm.	65.52		
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars of grade Fe-500D or more.	KG	393.12		
8	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in Cement mortar 1:4(1 cement : 4 coarse sand)	Cum	91.83		
9	Providing & Fixing Fencing of 1.8 M. height as per design using approved material	m.	260.00		
			Total		

LIST OF APPROVED MAKES/AGENCY OF MATERIALS (FOR CIVIL WORK)

The following guidelines are to be noted with regard to use of materials in the work.

1. The CONTRACTOR shall be required to use material of the make given in the list of approved make or specifically mentioned in the Bill of Quantity. EMPLOYER is free to demand the CONTRACTOR to use any particular make from the approved list of items.

   However in case of non availability of any item as per the list of approved make CONTRACTOR shall use alternative item of ISI make with prior written permission from the CONSULTANT/Project-in-charge.

2 Wherever, material bearing Standard Mark (ISI) is used in the work, the Contractor should furnish necessary documents and proof of payments made for the procurement of materials bearing Standard Mark (ISI).

3. In case it is established that Standard material (bearing ISI mark) as well as the materials indicated in the list (as mentioned in the above Para) are not available in the market, then approved equivalent materials may be used in the work subject to approval from the consultant and Project-in-charge.

4. For materials bearing "Standard Mark (ISI)" ordinarily no testing is to be done. However, in case of doubt or with a view to check the quality of materials, Project-in-charge may send samples for random testing.

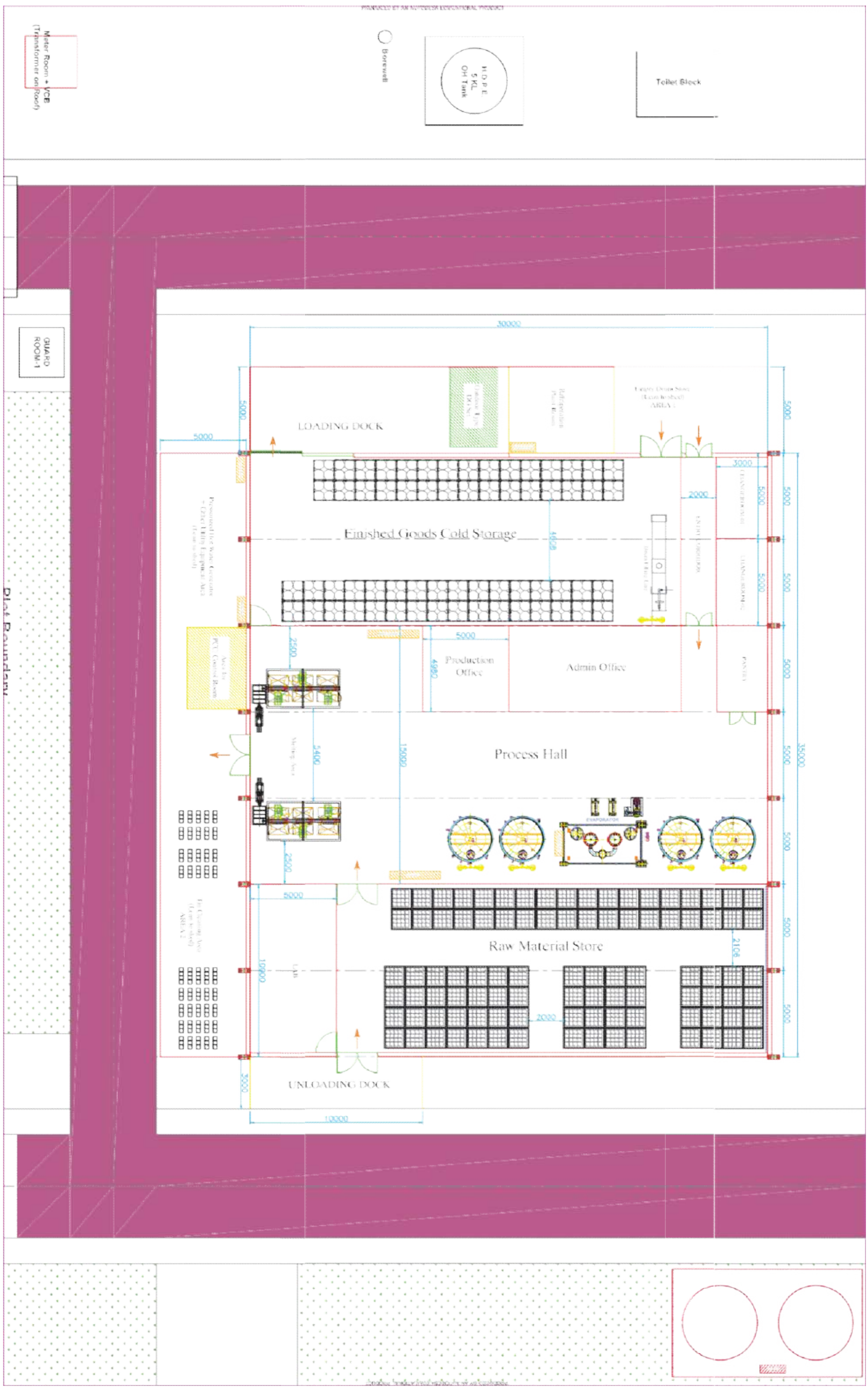
5. For use of materials other than materials bearing "Standard Mark (ISI)" Mandatory tests shall be conducted at the frequency specified in the contract. In case frequency of testing is not stipulated in the contract then standard specification (CPWD, ISI etc.) may be considered for frequency at which materials are to be tested.

6. Before bulk purchase of quantities of materials, it is the responsibility of the Contractor to get the samples of materials approved from consultant and Project-in-charge

Sl. No.	MATERIALS	APPROVED MAKE/APPROVED AGENCY
1.	Damp proof materials / water proofing compound	CICO, Fosroc, Sika or as approved
2.	Reinforcement steel	Tata, SAIL, Jindal or as approved
3.	Structural steel section	Tata, SAIL or as approved
4.	Cement	ACC, Ultratech or as approved
5.	White cement	JK white, Birla white or as approved
6.	Aluminum glazing section	Hindalco . Indal, Jindal or as approved
7.	Al. Glazing fabrication	As approved by Consultant
8.	Locks	Godrej, Harrison/Dorma or as approved
9.	Door closers	Dorma/Godrej or as approved
10.	Synthetic enamel paint	Berger, Asian paints, Nerolac or as approved
11.	Glazed ceramic tiles	Johnson, Somany, Kajaria or as approved
12.	Vitreous china sanitary ware	Parryware, Hindware or as approved
13.	Plastic W.C Seat cover – NA	Parryware, Hindware or as approved

14.	C.P Fittings/Accessories	As approved
15.	PVC Pipes & fittings	Supreme, Astral or as approved
16.	G.I Pipes `B' class	Tata , Jindal or as approved
17.	Bib cock & angle/stop cocks (brass), health faucets etc	As approved
18.	HDPE Water tank	Sintex or as approved
19.	Toilet Accessories	As approved

Note – All Items subject to prior approval from the Consultant in writing



NAFED

TENDER (TECHNICAL)
FOR
DESIGN, SUPPLY, ERECTION & COMMISSIONING
OF
P.E.B FOR HONEY PROCESSING UNIT

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

NAFED

Contents

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

NAFED

SECTION 1

INTRODUCTION:

National Agricultural Cooperative Marketing Federation of India Ltd. (N.A.F.E.D) is inviting tender bids for Design, Supply, Erection & Commissioning of a pre-engineered steel building as described below for construction at selected locations.

These buildings shall be used for the storage of raw honey received from district level collection center, it's processing and then the storage of the processed & packed packaged honey. (Kindly refer to the GA drawing for details on area utilization.)

The bidder to submit detailed proposal as per the format attached and comprehensibly adhere to the exact specifications as mentioned in this document. Any deviation with genuine reason can only be done after the approval of consultants/ promoter as the case may be.

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SECTION 2

1. Description for Main Process Building

BUILDING USAGE : SHED
NO. OF IDENTICAL BUILDINGS : ONE

S. NO.	Description	Details
1	TYPE	STRAIGHT COLUMN
2	WIDTH	30 METER c/c OF STEEL LINE
3	LENGTH	35 METER c/c OF STEEL LINE
4	HEIGHT	7.5 METER (Eave Height)
5	ROOF SLOPE	1:10
6	WIDTH MODULE	6 @ 5 METER
7	FRONT END FRAME	RIGID & BEARING
8	REAR END FRAME	RIGID & BEARING
9	TYPE OF BRACING ON ROOF & WALL	DIAGONAL PIPE BRACING & PIPE STRUTS
10	ROOF	0.5MM THICK BARE GALVALUME SHEET
11	WALL	0.5MM THICK PCGI SHEET ALL FOUR SIDES ABOVE 1.0 METER HIEGHT OF BRICK WALL UPTO ROOF.
12	GIRTS	SIDEWALL GIRTS AND ENDWALL GIRTS ARE MOUNTEDON THE EXTERIOR FACE OF THE MAIN COLUMN.
13	SKY LIGHT PANELS	INCLUDED 5% IN ROOF.
14	FASTENERS	ALL HARDWARE REQUIRED FOR ERECTION OF THE PEB STRUCTURE CONFORMING TO ASTM-A 325 M & ASTM A307.
15	ACCESSORIES	SHALL BE INCLUDED FOR THE PEB BUILDING
16	BUILDING CONDITION	ENCLOSED
17	PRIMER	RED OXIDE (2 COATS-30 MICRONS DFT EACH)
18	PAINT	SYNTHETIC ENAMEL (2 COATS-30 MICRONS DFT EACH)

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

2. Description for Lean to Sheds

BUILDING USAGE : LEAN TO
NO. OF BUILDINGS : TWO SIDES

1	Frame Type	Lean to
2	Width (outer to outer)	Area1: 5 m Area 2: 5 m
3	Length (outer to outer)	Area1: 30 m Area 2: 35 m
4	Clear Height (From FFL)	5 m
5	Width Module	Area 1: 1 x 5m Area 2: 1 x 5m
6	Roof Slope	1:10
7	Bay Spacing-Center to Center	Area 1: 6 @ 5.0 m, Area 2: 7 @ 5.0 m
8	Type of End Frames	Expandable
10	Bracing Type	Vendor design
12	Paint	2 coats of synthetic enamel over primer

Design and Loads Details (Live/Wind):-

The building is designed for the following Live Load and Wind Speed.

S. NO.	Description	Details
1	LIVE LOAD	0.75 KN/m2
2	DESIGN LOAD	0.35 KN/m2
3	WIND SPEED	47 M/Sec.
4	SEISMIC ZONE	II
5	LIFE OF BUILDING	25 YEARS

DEFLECTIONS:-

S. NO.	Description	Details
1	VERTICAL	L/180
2	LATERAL	EH/150
3	PURLINS	L/180

APPLICABLE CODES:-

Design shall be as PER IS:800-1984 & Deflection as per IS:800-2007

Cold-Formed members shall be designed in accordance with:
American Iron & Steel Institute (AISI)

Welding shall be applied in accordance with:
American Welding Society (AWS D1.1.98) Structural Welding Code – Steel

SECTION 4

Standard Supplied Materials- The following shall be included to supply:-

a. Rigid frame structural for columns, rafters with end plates, purlins, girts.
b. Structural hardware.
c. Bracing rod, Anchor bolts and templates
d. All structural shall be mechanically wire brush cleaned.

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SECTION – 5

TECHNICAL SPECIFICATIONS OF WALL & ROOF

Walls:

The building's all four sides are considered brick up to 1.0 Meters height. The wall sheet shall be done with 0.5 mm TCT high tensile PCGI Sheet.

Roof Cladding:

The roof cladding shall be done with 0.5 mm TCT high tensile Bare Galvalume Sheet with depth of crest-28-30mm, pitch 195-200mm or vendor design(with approval from consultant) trapezoidal sheet. The roofing sheet shall be supplied with STSD screws for the fixing. The sheets shall have overlap joinery systems. The top coat of the sheet shall preferably be Appliance White/Blue. The building shall be complete with necessary flashings like, Ridge Flashings, Gable end flashings, trims, Gutter and down spouts. 5% polycarbonate considered for sky light.

Cladding Sheet on the top Portion wall fascia all four side:

The wall cladding sheet shall be done with 0.5 mm TCT high tensile PPGI Sheet with depth of crest-28-30mm, pitch 195-200mm trapezoidal sheet on top portion of wall fascia.

Window:

Aluminum framed fixed clear multiwall polycarbonate 8mm thick windows shall be provided.

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ANNEXURE - A

Specification of Materials:-

1. **Primary Members:**

All primary members (Columns & Rafters) shall be fabricated from Plates having minimum yield strength of 345 MPa/ 240 MPa and will conform to ASTM-A-572 Standard. The primary members shall be fabricated by continuous shop automated welding using submerged arc welding. Primary members fabricated from plate shall have flanges and webs joined one side alternate and on other side of the web by a continuous welding process.

2. **Secondary Members:**

The secondary members consist of Z-Purlins and eave struts coated with two coat of primer and two coat paint shall be of Cold formed steel having minimum yield strength of 345 Mpa and conform to ASTM A 1011.

3. **Anchor Bolts:**

Anchor bolts shall be 240 MPa steel bolts as per approved design.

Site Connections:

(A) All Primary Bolted connections will be furnished with High Strength Bolts confirming to Specifications of Gr. 8.8, IS: 3757 & 1367 or ASTM-A325

(B) All Secondary Bolted connections would be furnished with machine bolts conforming to the Specifications of Gr. 4.6,.IS: 2367 & 1363 or ASTM-A307

Shop Connections:

All shop connections shall be welded using Submerged Arc Welding process and welding to be in accordance with AISC Standards.

5. **Roof & Wall Bracings:**

Roof bracings would have yield strength of 240 MPa and shall conform to the Specifications of relevant ASTM-A36 or ASTM-A570.

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6. **Painting of Structural Members:**

All Primary and Secondary members shall be cleaned by wire brushing to remove dirt, grease, oil and loose scales and given two shop coat of primer & two coat paint finish.

7. **Design codes & Minimum Requirements:-**

Mainframe members shall be Solid Web Straight (Built-up sections) & Cold formed Secondary Sections shall be designed in accordance with the current edition of the relevant IS / AISC and applicable Building Codes.

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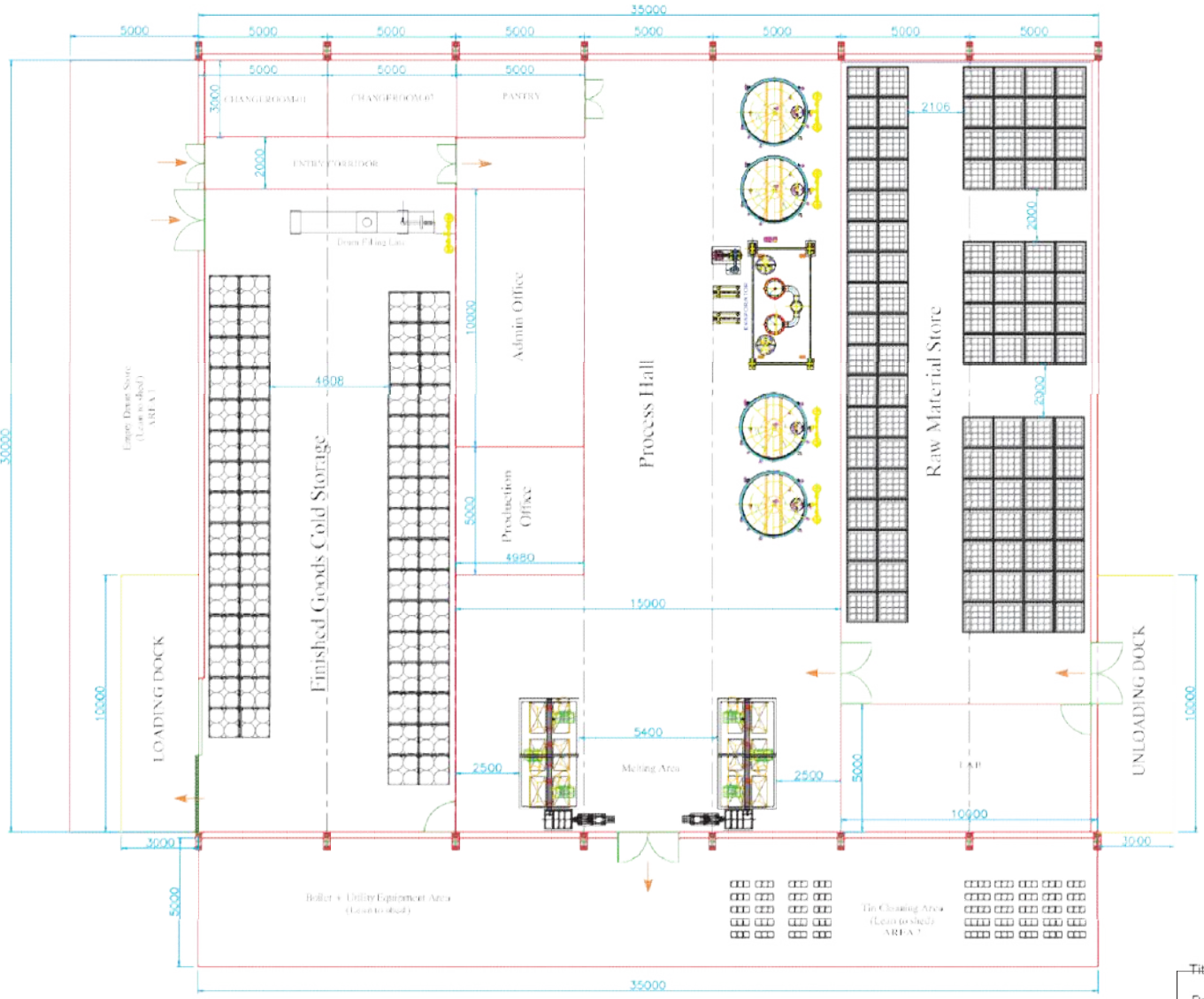
ANNEXURE 'B'

(Quantities mentioned here are for indicative purposes only
& supposed to depend on Vendor Design & Site Conditions)

Sl. No.	Item	Description	Qty.	UOM
1	Built-up	Structural steel frames (MF - Col & Rafter, Mezzanine Joists, columns, rafters, etc.,)	28,875*	kg.
2	Cold Formed Steel	Structural steel in purlins & girts	2,187*	kg.
3	HR & Misc steel	Structural Steel in Bracings, sag rods flange braces, Anchor bolt, etc.	1,512*	kg.
4	Hardware	HS/MS- MF	678	Kg
5	Anchor bolt	---	250	Kg
6	Eaves Gutters	PPGS of 0.47mm thick TCT	72	RMT
7	Down take pipes	PVC Pipes 100mm dia	120	RMT
8	Flashing, Hardware & Accessories	Window flashing, door flashing, Inner flashing, Outer flashing, rivets, anchor fastener, silicone sealant, etc.	1	Lot

* Indicate weights, Subject to change as per site conditions

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***



Typical Layout at Processing Hub 1, 2 & 3 (Bulk Packs)

Title : Typical Layout at Processing Hubs 1, 2 & 3 (Bulk)

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental

Mariental India Pvt. Ltd.

CLIENT

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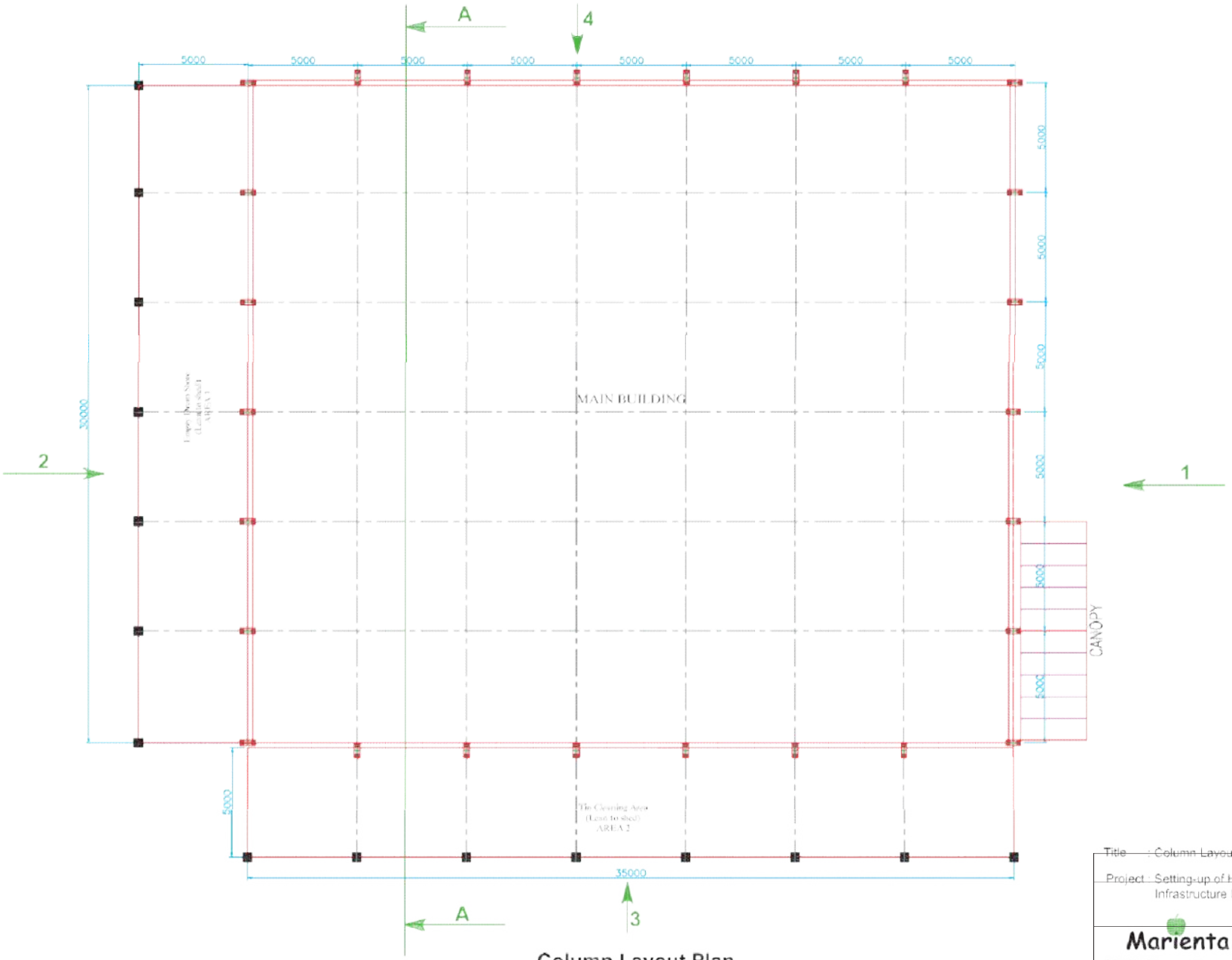
CHECKED BY				
APPROVED BY				
DRG. NO: E - 2105 - 0[illegible]				0



Column Layout Plan

Title : Column Layout Plan of Proposed P.E.B.

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd.

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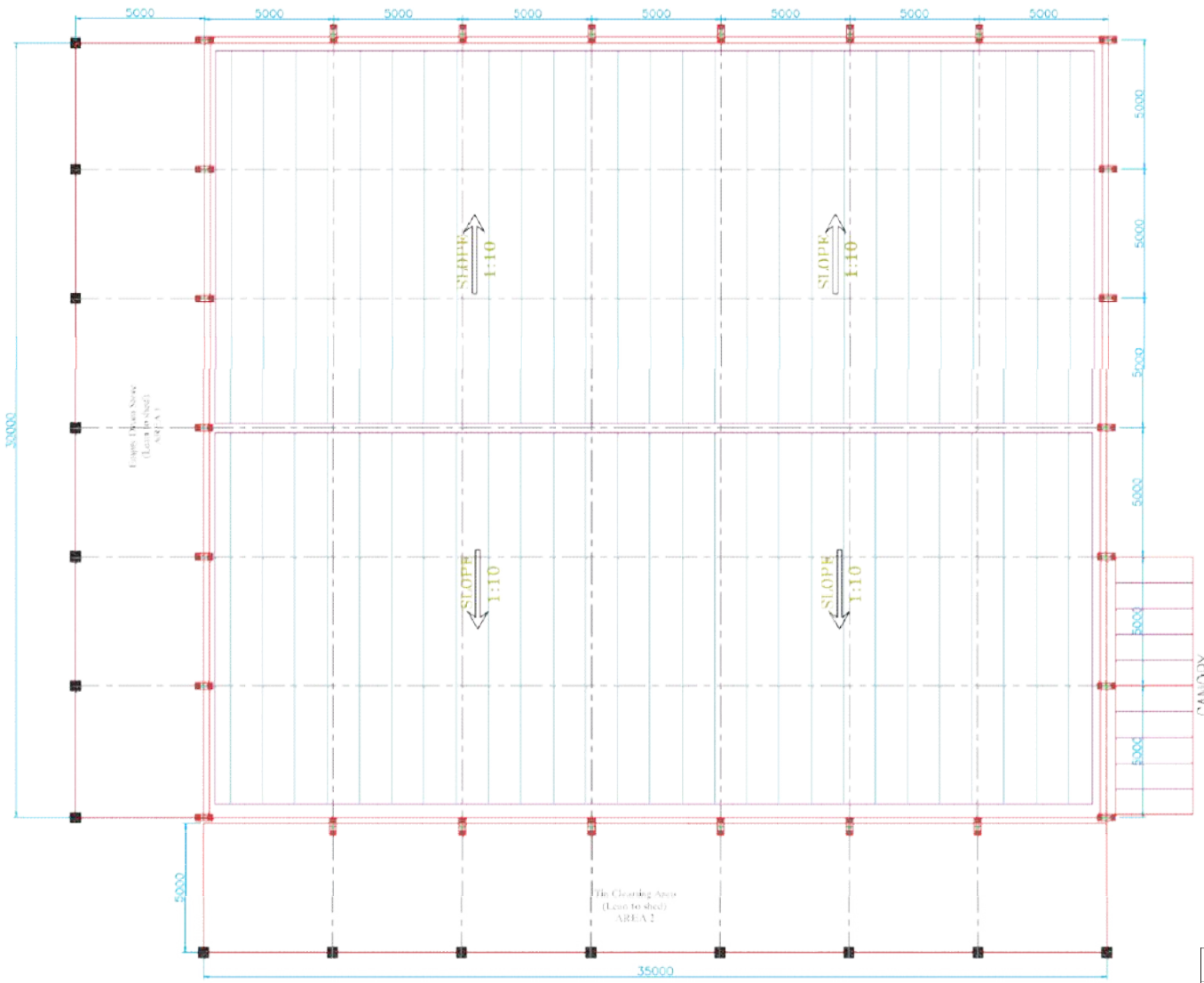

Roof Plan

Title : Roof Plan of Proposed P.E.B.

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

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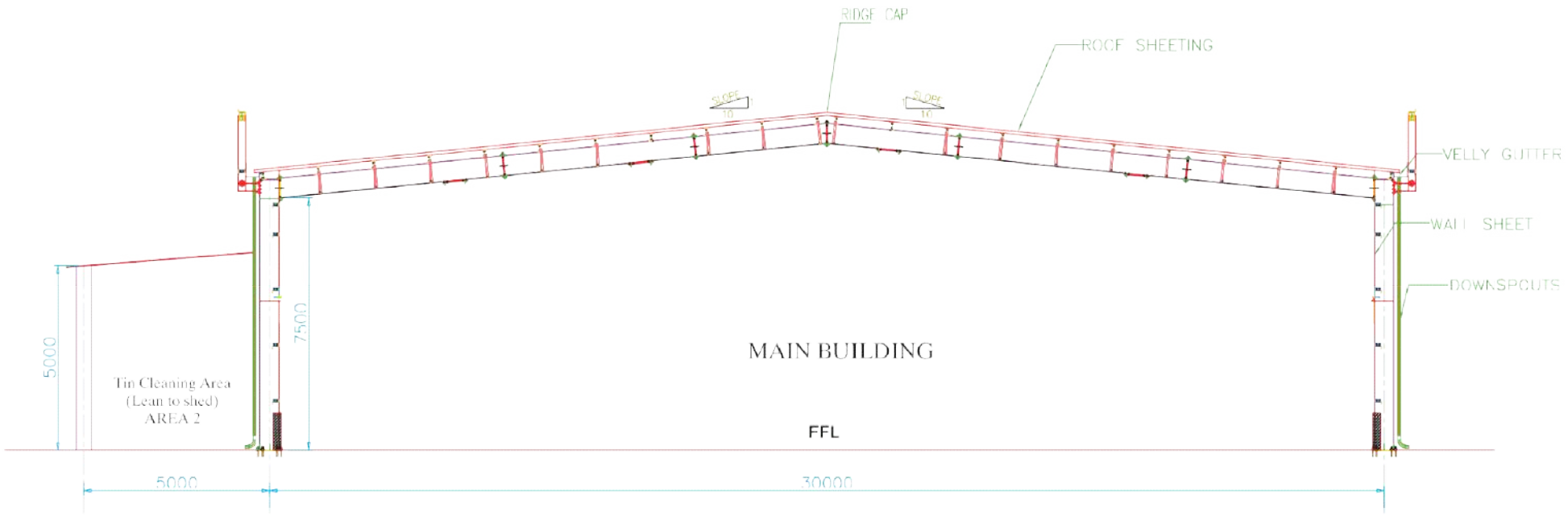

Section- 'A' - 'A'

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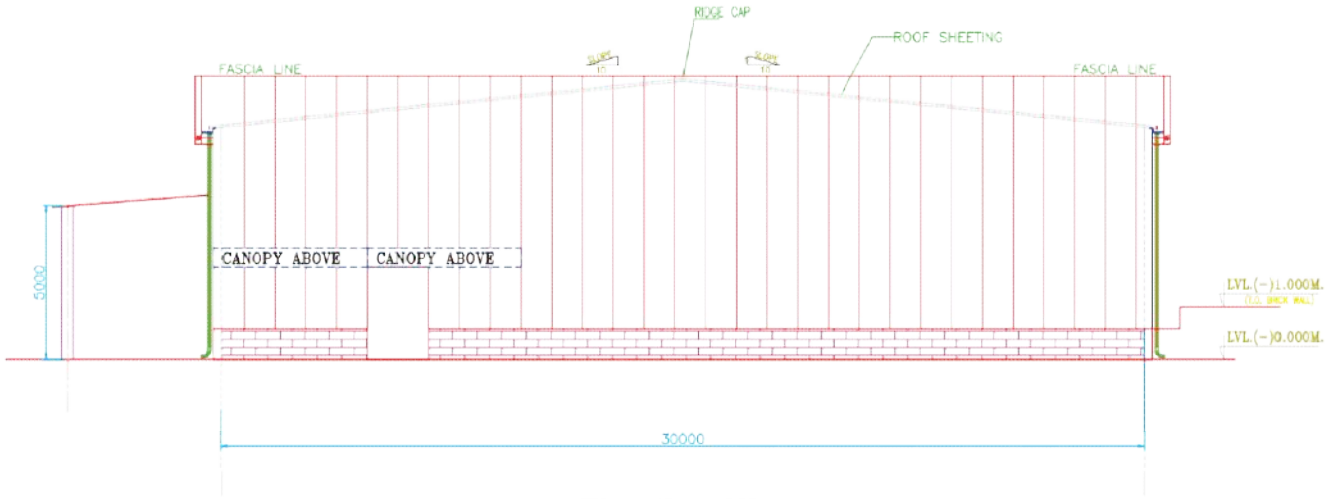
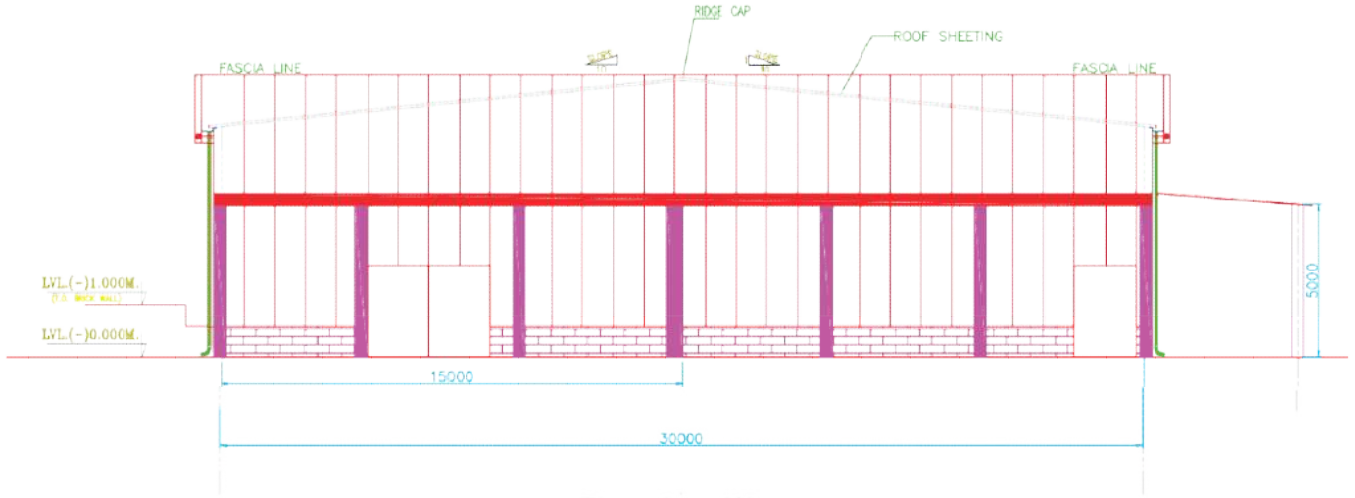
Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.			
Mariental India Pvt. Ltd.			
DRAWN BY	B. Singh	05/07/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd., NAFED, New Delhi
CHECKED BY	V. Kumar	05/07/2021	
APPROVED BY	V. Kaul	05/07/2021	SCALE: NTS REV.
DRG. NO: E - 2105 - TENDER B1/03			0



Elevation- '1'



Elevation- '2'

Title : Section '1' & '2' of Proposed P.E.B.

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd.

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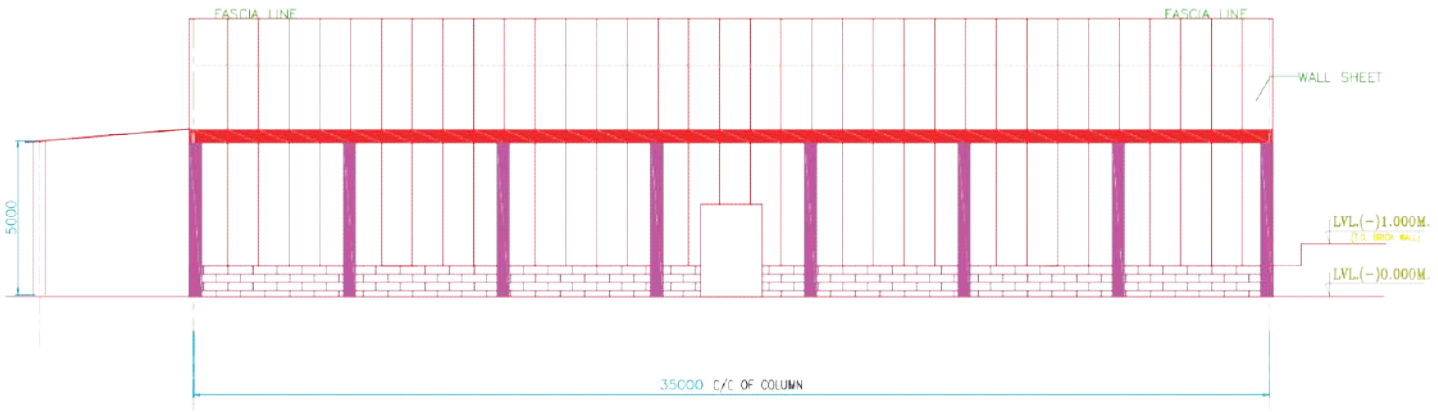
APPROVED BY		05/07/202	SCALE: NTS	REV
DRG. NO: E - 2105 - TENDER R1/04				0



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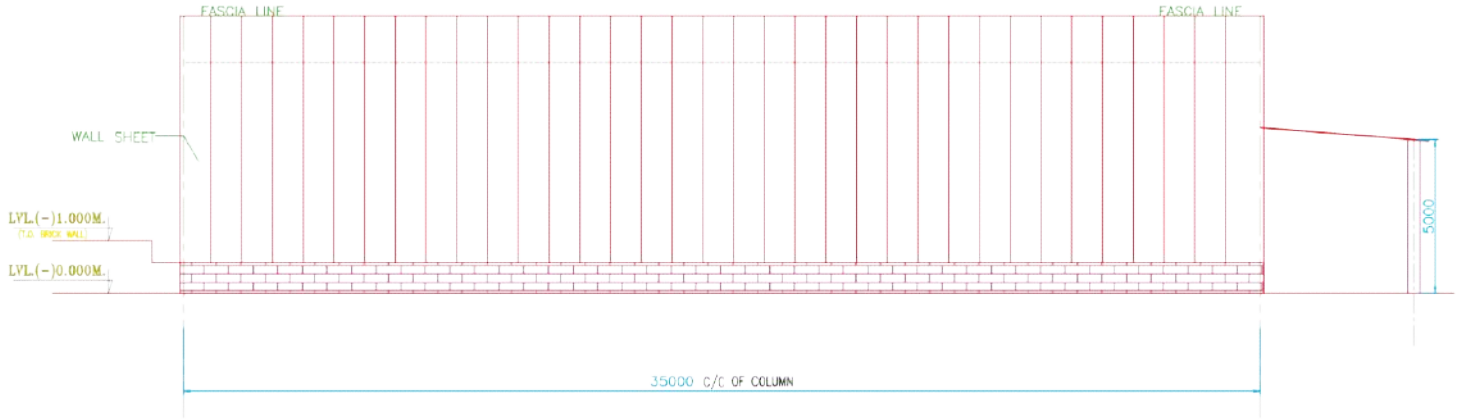

Elevation- '4'

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Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.				
Marienta India Pvt. Ltd				
DRAWN BY			CLIENT : National Agricultural Cooperative Marketing Federation Ltd., NAFED, New Delhi	
CHECKED BY		05/07/202		
APPROVED BY		05/07/202	SCALE: NTS	REV.
DRG. NO: E - 2105 - TENDER P.1/0				0

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TECHNICAL SPECIFICATIONS SHEET FOR SCRAPPED SURFACE HEAT EXCHANGER (S.S.H.E.)/ EVAPORATOR & HONEY CONDENSER

1.0 Moisture Reduction Unit

i.	Function	:	Moisture reduction in honey by use of hot water as heating medium
ii.	Equipment	:	Vertical Scrapped Surface Evaporator
iii.	Product to be handled:		Raw Honey
iv.	Capacity	:	500 kg/hr for each unit (2 Units)

Raw honey comes with different moisture levels but the filtered natural honey is specified by the international trade as containing not more than 18% moisture. In order to achieve this specification raw honey is subjected controlled heating for evaporation of excess moisture.

The moisture reduction system should consist of two independent units for honey processing with independent feed tanks, transfer pumps, flow control valves, scrapped surface evaporators and product discharge pumps.

However the vapour duct, condensor, condensate pump and vacuum pump may be common.

The system should be designed such that it can also be suitable for operation with two types of honey independently and simultaneously on one single type as well.

The offer should be on turnkey basis and on all inclusive within battery limits including, supply, erection, fabrication, installation, trial runs and commissioning.

The broad scope of supply is defined hereunder:-

i.	BALANCE TANK FOR FEED	:	2 Nos.
	Capacity	:	300 L each
	Material of construction	:	SS 304

Balanced Feed Tanks should be equipped with
- suitable inlet, outlet and drain connections
- supporting legs and
- cover at the top.

ii TRANSFER PUMP : 2 Nos.

Capacity	:	As required
Material of construction	:	SS 304
Type	:	Positive Displacement Screw Type

The transfer pumps should have adequate capacity to pump the feed to the evaporator. The pumps should be supplied with suitably rated motor, V-Belt, Pulley, Belt guard etc.

iii. FLOW CONTROL VALVE : 2 Nos

For accurate control of feed rate, completed with SS union connections
Material of construction : SS 304

iv. SCRAPPED SURFACE EVAPORATOR : 2 NOS.

The Scrapped Surface Evaporator shall have vertical shell-in-shell configuration of appropriate diameter. (Refer attached GA Drawing)

The product shall fall on the inner shell which should have Teflon scrapper for scrapping the product on the walls of inner shell in order to get a thin uniform film. The scrapper should be driven by electrical geared motor of suitable rating.

An outer shall of bigger diameter shall act as heating medium holding and circulating system. The outer shell should be insulated and cladded with SS sheet of appropriate thickness.

Material of construction	:	AISI 304
Quantity	:	2 Set
Combined Feed Rate	:	1,200 kg/h
Initial TS	:	70- 76 Deg. Brix.
Final TS	:	82 Deg. Brix.
Product Output	:	1,000 kg/h
Total water evaporation	:	120 kg/h

Utility Specification & Equipments to be provided:

Hot water circulation temp	:	85-90 deg C
Hot water circulation qty	:	Vendor to define
Power	:	Vendor to define
Cooling water circulation temp	:	inlet 30 deg C
Tolerances	:	+/- 5%

The evaporators should also be equipped with mechanical seal arrangement to prevent any pressure / vacuum loss.

v. HOT WATER PUMP

Capacity	:	As required
Quantity	:	1 No.
MOC	:	CI

The pump should be complete with motor.

vi. VAPOUR DUCT

Vapour duct shall be common for connecting both the evaporator to the condensor

Quantity	:	1 Set
MOC	:	SS 304

This should be made of suitable thickness stainless steel for interconnecting the scrap surface evaporator and condensor.

vii. HOT WATER SUPPLY SYSTEM

Incoming hot water supply line and individual branch connections should be provided, including insulation and cladded with aluminium.

viii. CONTROL PANEL

Quantity	:	1 No.
MOC	:	SS 304

This should be supplied to facilitate all the process operation and should consist of starters, push buttons, panel mounted process parameter indicating instruments, a process mimic diagram with corresponding indication lamp. The instrument panel should be pre-wired to terminal connection.

The control panel should be equipped with

Temperature indicators. for measuring product temperature at inlet and outlet, hot water inlet and outlet temperature.

FIELD MOUNTED INSTRUMENT:

2 No.	6” dial type vacuum gauges for indication of vacuum.
2 Nos.	temperature gauges.
1 No.	glass tube rotameter in the condensate line
4 Nos	PT-100 for inlet and outlet temperature of Honey and water

ix. S.S. PIPES & FITTINGS : 1 Lot

All piping within the battery limits should be considered in the scope of supply.

- Both the balance feed tank should be connected to the suction of feed pumps, so that feed of both pumps can be done from any one of the tank.
- Independent outlet from the both evaporator to storage tank.
- Necessary controls and valves (manual) for the above system
- Valve at the outlet of evaporators

x. CONCENTRATE EXTRACTION PUMP

Capacity	:	As required
M.O.C.	:	SS304
Quantity	:	2 Nos
Type	:	Positive Displacement Screw Type

These are required for transfer the concentrated honey from the evaporator to storage tank through a Shell & Tube Cooler.

xi. CONDENSOR

Quantity	:	1 No.
Type	:	Surface Type (Shell and Tube)
Capacity	:	As per specified evaporation rate
M.O.C.	:	SS 304

This should have a shell & tube design having a bunch of SS tubes mounted in a vertical shell. The cooled/ chilled water shall be circulated in the tubes and vapour gets condensed on the shell side. It is to be made of SS 304.

The condenser will be completed with following fittings and accessories:

-Chilled / Cooled Water inlet and outlet connection with matching flanges.
-Vacuum connection
-1 No. Sight glass

xii. CONDENSATE PUMP

The condensate pump is required for extracting out condensate

Capacity	:	250 LPH
Quantity	:	1 No.
M.O.C.	:	SS316
Type	:	Centrifugal

xiii. VACUUM PUMP

The vacuum pump shall be provided for developing vacuum in the evaporator for reduction of boiling point of the product and achieve required evaporation rate at a much lower temperature of the heating medium and vapour condensation..

Quantity	:	1 No.	
M.O.C.	:	Casing	: CI with SS sleeves
		Cover	: CI
		Rotor	: SS 304
Quantity	:	1 Set	
Capacity	:	As required	

The scope of supply and erection should be considered on all inclusive basis including all piping, unions, bends, tees, valves, pipe supports etc. for inter-connecting various components of the plant based on a compact layout.

The support structure for the evaporators, condenser and coolers shall also be considered as part of supply and erection battery limits.

The buyer shall provide all the utilities like power, hot water, cold water, chilled water etc, at one point only.

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TECHNICAL SPECIFICATIONS FOR HONEY CONDENSER

A. Equipment:

This equipment is required to heat / cool processed honey as per the requirement.

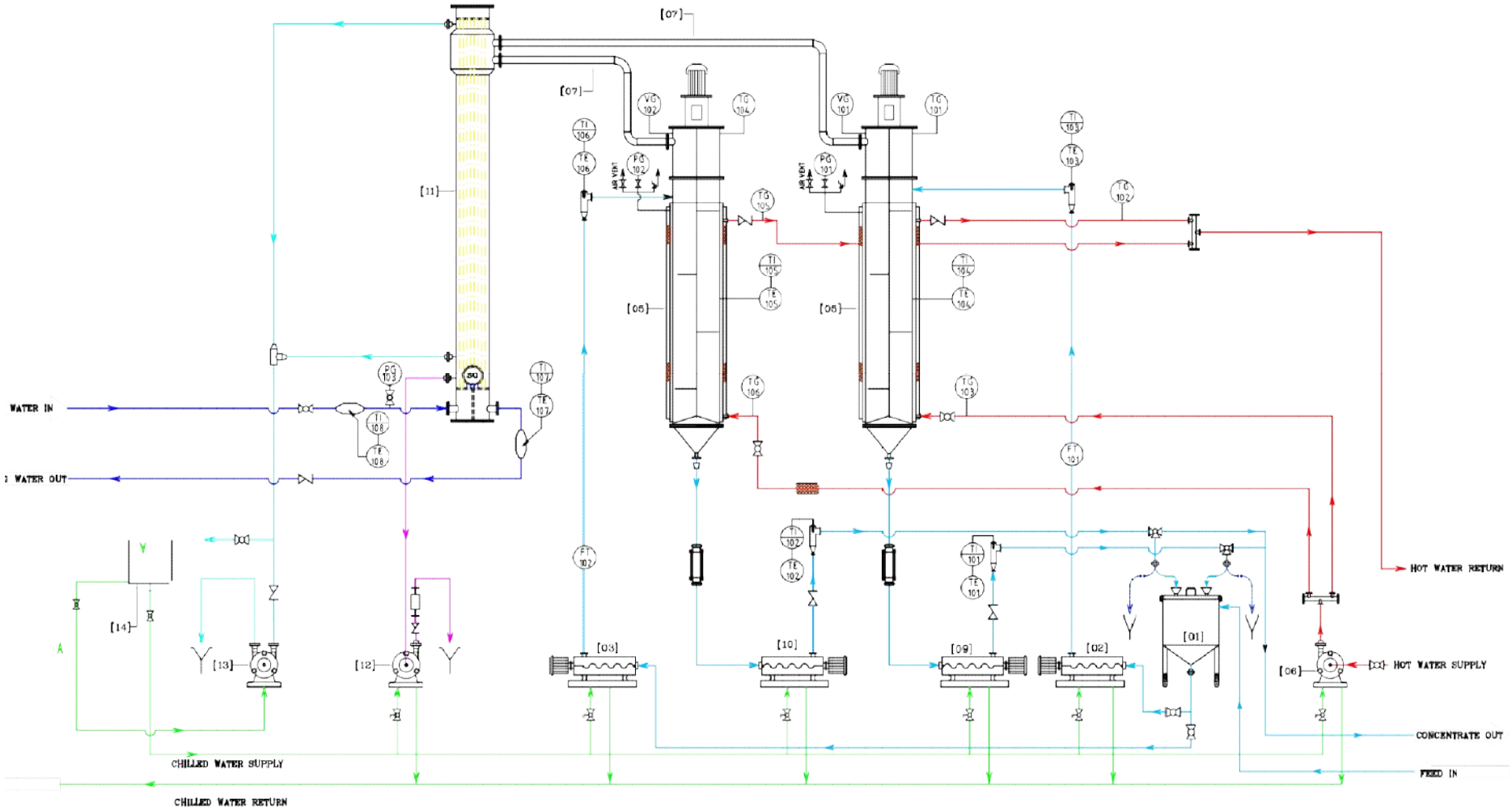
B. Brief Specifications:

i. Type : Shell & Tube Type
ii. Nominal Heat Transfer Area : 3 square meter
iii. Design : Single Pass
iv. Shell Dia : 200 NB

C. Detailed Specifications:

S. No.	Description	Quantity	Material	Size
1.	Condenser Shell	1	SS 304	200 NB, Sch 10 Pipe x 2980 mm long
2.	Tube Sheet	2	SS 316	16 Thk.
3.	Tube	19	SS 316	19 NB X 2 (14 swg.) X 3000 Lg.
4.	Baffle Plate	9	SS 304	Min 4 Thk
5.	Bonnet (Inlet Side)	1	SS 316	Vendor design
6.	Bonnet (Outlet Side)	1	SS 316	Vendor design
7.	Bonnet Flange	2	SS 316	16 thk.
8.	Tie Rod	4	SS 304	Ø 10 Bar
9.	Spacer	36	SS 304	6 NB Pipe, Sch. 5
10.	M 10 Hex Nut with washer	4	SS 304	---
11.	M 12 x 16 Lg. Hex Hd. Bolt	16	SS 304	With nut & washer
12.	Gasket	2	Silicone Rubber	Min. 3mm thk.

Please also refer to the GA drawing of the honey condenser. Any changes or modifications subject to prior approval of Consultant.



P & I Drawing of S.S.H.E

CONTROL PANEL
WATER CHILLER
VACUUM PUMP
CONDENSATE PUMP
SURFACE CONDENSER
CONCENTRATE EXTRACTION PUMP
CONCENTRATE EXTRACTION PUMP
SS PIPES & FITTINGS
VAPOUR DUCT
HOT WATER PUMP
SCRAPPED SURFACE EVAPORATOR
-
TRANSFER PUMP
TRANSFER PUMP
BALANCE TANK FOR FEED
Description

LINE LEGEND

- VACUUM LINE
- PRODUCT LINE
- COOLING WATER S/R
- CHILLED WATER S/R
- CONDENSATE LINE
- HOT WATER S/R

INSTRUMENT LEGEND

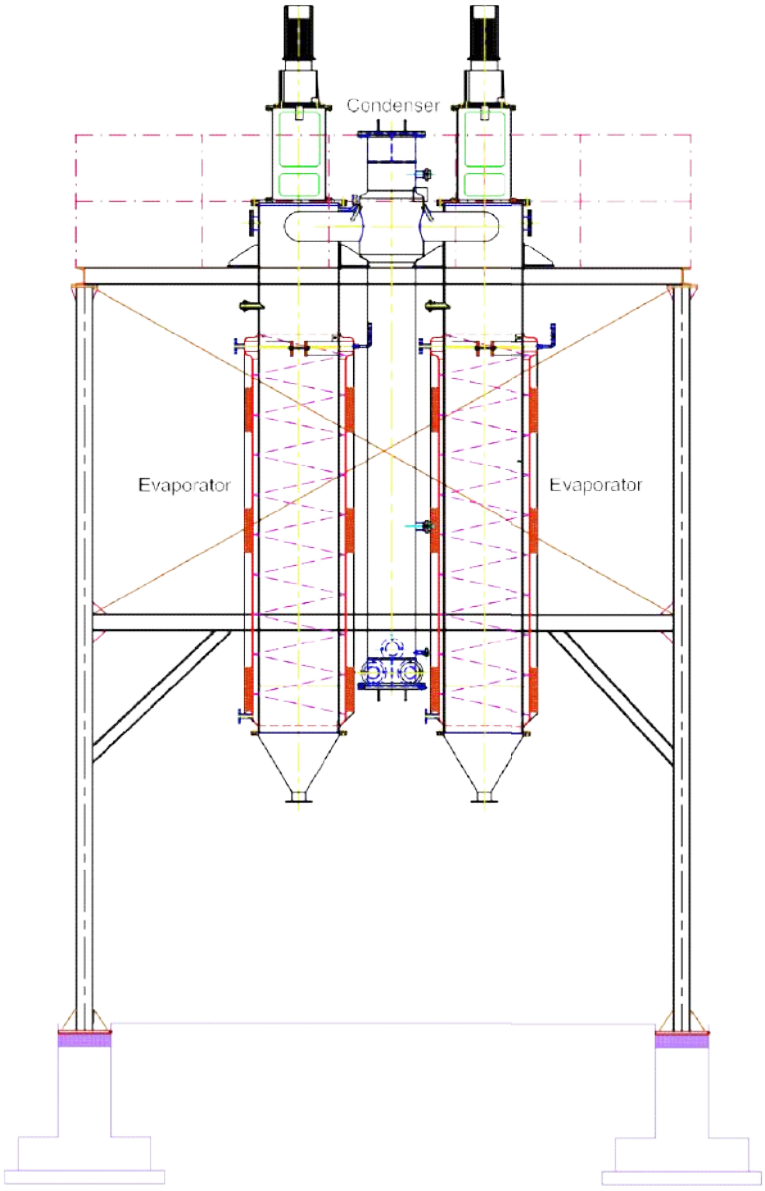
- TE — TEMPERATURE ELEMENT
- TIC — TEMP. INDICATING CONT.
- VG — VACUUM GAUGE
- SG — SIGHT GLASS
- PG — PRESSURE GAUGE
- TI — TEMPERATURE INDICATOR

Title : P&I Drawing of S.S.H.E./ Evaporator

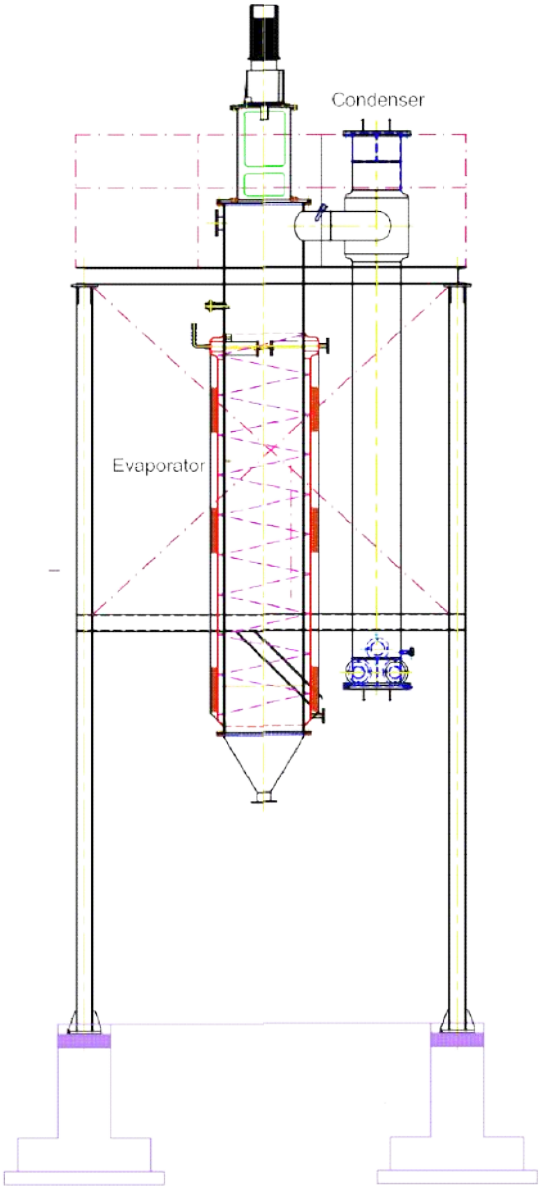
Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd.

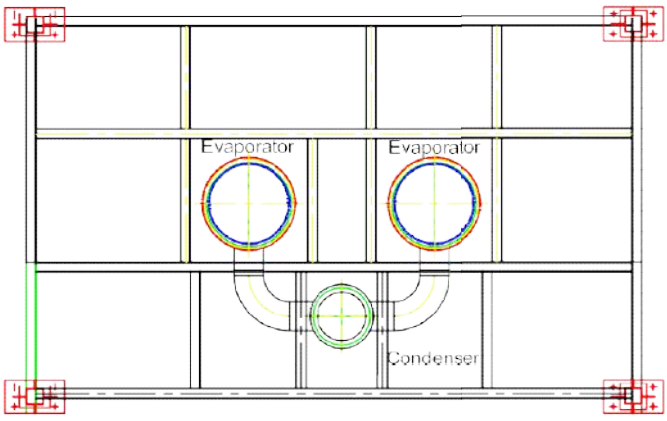
DRAWN BY	R. Singh	17/06/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (NAFED), New Delhi	
CHECKED BY	V. Kumar	18/06/2021		
APPROVED BY	V. Kaur	18/06/2021	SCALE: NTS	REV
DRG. NO: E - 2106-10 - TENDER E1- 01				0



ELEVATION



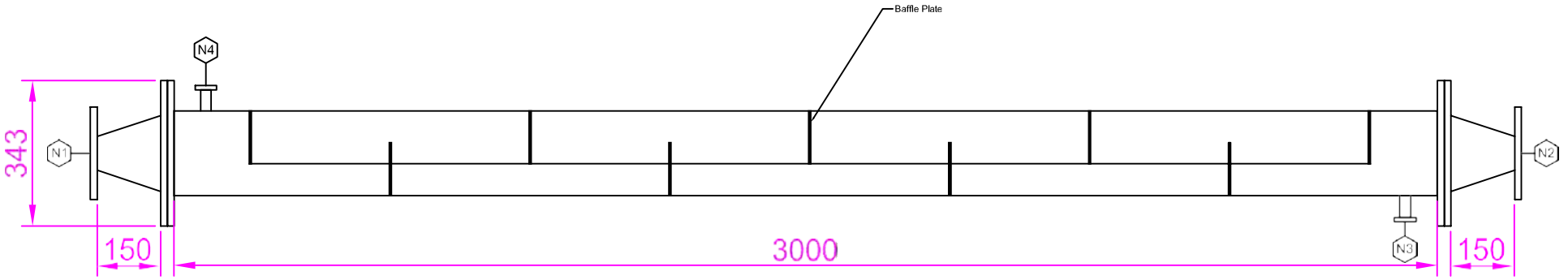
SIDE VIEW

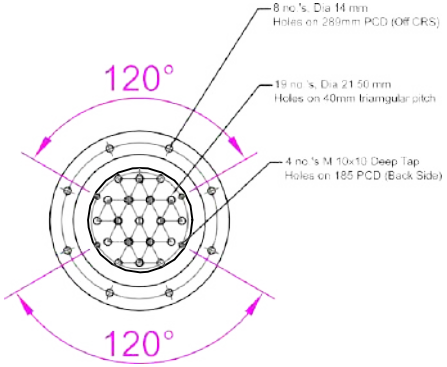


TOP PLAN

GA Drawing of Scrapped Surface Heat Exchanger

Title	: G.A. Drawing of S.S.H.E./ Evaporator
Project	: Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.
Mariental	Mariental India Pvt. Ltd.





Nozzle Schedule

	Description	Size	Remarks
N1	Product Inlet	3" NB	ASA#150
N2	Product Outlet	3" NB	ASA#150
N3	Utility Inlet	1" NB	ASA#150
N4	Utility Outlet	1" NB	ASA#150

GA Drawing of Shell & Tube Honey Condenser

Title : G.A. Drawing of Honey Condenser				
Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.				
Mariental India Pvt. Ltd.				
DRAWN BY	R. Singh	17/06/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (NAFED), New Delhi	
CHECKED BY	V. Kumar	18/06/2021		
APPROVED BY	V. Kaul	18/06/2021	SCALE: NTS	REV.
DRG. NO: E - 2106-10 - TENDER E1- 03				0

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TECHNICAL SPECIFICATIONS SHEET FOR HONEY DE-CRYSTALLIZER FOR BUCKETS

A. Definition:

The purpose of the equipment is to melt raw honey stored in HDPE buckets or any other container received from the beekeepers. It has been found through experiences that honey collected from the beekeepers consists of bees wax, impurities dust etc., all these tend to make it more thick and during winter season highly crystallized together with the sucrose component. The degree of crystallization is a function of ambient temperature & type of honey. DC equipment marks the first step in the processing of honey. Honey received from Bee Farmers is molten by applying controlled heat in terms of temperature and air flow in DC chambers. Molten honey is subjected to filtration procedures using various type of filters like gravity filter, centrifuge or other suitable type of filters, and stored in Bulk Storage Tanks for further processing.

B. Heating System:

The heating system for the DC shall have automatic controls for temperature control. Preferred heating medium for the chamber shall be hot water-air system based on forced convection through finned tube radiator using centrifugal blower system. The air temperature inside the chamber shall under no circumstances cross the upper limit of 95 Deg C and shall be achieved using hot water in requisite quantity at a pressure of 1.5 Bar or lower.

C. Capacity:

DC will have a capacity to hold and melt at least honey in 120 buckets i.e. 2400 Kg of raw honey in a process cycle of 60 minutes each and loading/unloading cycle of 30minutes each. The hourly capacity shall be 1.5 – 1.6 MT of melted raw honey.

D. Number Required:

At each processing center single number DC for buckets is required to be installed to achieve the proposed plant capacity of 1,000 Kg per hour.

E. Material of Construction:

All the product contact part will be made in SS 304 and the support structure can constructed in SS 304 clad mild steel members.

F. General Arrangement / Brief Description

The DC consists of four major components viz;-

1. **Melting Chambers with insulation doors and grated metal floor** on which the honey buckets will be placed in inverted position. Bottom of the chamber will be a hemi-cylindrical jacketed tank which is slightly sloped towards the outlet side to ensure better flow-ability of honey. Each DC shall be a non partitioned chamber with only length wise partition for aiding air circulation (Please refer to the GA drawing.)

2. **Finned Tube Hot Water Radiator:** Finned tube radiators shall have hot water box with tube sheet for mounting suitable number of tubes on one side and condensate box with matching tube sheet on other side. The radiator should be able to withstand a pressure of 3.0 bar although the operational hot water will only be used @ 1.5 Bar. Main function of the Finned Tube Radiator is to heat air to requisite process temperatures by forced convection. The design should be compact and can be multi-layer. The MOC shall be only SS304 for the tubes, fins, tube sheet and fame in contact with air.

3. **Centrifugal Blower & Duct Arrangement:** On top of the DC chamber a duct arrangement for suction of cold air & throw of hot air from one side to other shall be installed. The duct shall on one side be connected to the radiator and other side to the suction of the blower of suitable airflow capacity and static pressure. A distance piece shall connect the discharge of the blower and the radiator. (Please refer to the GA drawing.)

4. **Control Panel:** Temperature sensors for air inlet, air outlet and product are to be placed at all suitable location so that all the temperatures can be monitored for the regulation of steam flow in order to adhere to the process parameters w.r.t air and product temperature. The control panel shall have controllers and indicators to show all process parameters, contactors and push buttons for blowers, controls for steam solenoid valves.

G. MAJOR COMPONENT SPECIFICATIONS:

1. Dimensions: The dimension of the equipment is 4.3 meter (length) x 2.3 meter (width) x 3.4 meter (height). The chamber floor for keeping inverted buckets is at a height of 910 mm from FFL. Please refer to the GA drawing for more information.

   For further details please refer to the GA drawing for de-crystallizer.

2. Hot Water Radiator:

i.	Number of	:	One on each DC
ii.	Type	:	Finned Tube Type Air Heater
iii.	Capacity	:	1,50,000 K Cals/hr
iv.	Air Flow	:	12,000 CFM @ 80^0 C
v.	Air Inlet/ Outlet Temp	:	80^0 C & 90^0 C
vi.	Heating Media	:	Hot water @ 1.5 bar g - 111 ^{0} C
vii.	Hot Water Circulation	:	About 15,000 liter / hr
viii.	Air Pressure Drop	:	Less than 25 mm WC
ix.	Finned Tubes	:	*Vendor design in SS304 material*
x.	Fin OD----------		do--
xi.	No. of Tubes	:	--do--
xii.	No. of Rows	:	--do--
xiii.	Tube-sheet	:	--do--
xiv.	Body	:	--do--
xv.	Face Area	:	--do--
xvi.	Overall size	:	4000mm (L) x 1200mm (W) Depth as per *Vendor Design*
xvi	In/Out Connections	:	*Vendor design in SS304 material*
xviii.	Testing	:	Tube side hydro tested @ 5 Kg/ sq. cm

3. Centrifugal Blower:

i. Number of	:	3 for each DC
ii. Capacity	:	4,000 CFM
iii. Static Pressure	:	50 MMWC
iv. Application	:	Hot Air circulation
v. Radiator Temp.	:	111° C
vi. Motor	:	2HP/4P/3PH/50 HZ
vii. Type of blower	:	SISW (Single inlet Single Width) with wide mouth discharge
viii. Motor Make	:	Crompton/ABB/Havells
ix. MoC	:	SS 304

H. FINISH

a. All internal surface mirror polished
b. All external S.S. surfaces matt finished
c. All M.S. Surfaces gave one coat of red oxide primer and 2 coats of High Temperature Aluminium Paint

I. TESTING

a. Chemical all elements for S.S. 304
b. Holding Tub full water filled
c. Jacket hydro test at 3 kg. / sq.cm.

NAFED

TECHNICAL SPECIFICATIONS FOR GRAVITY FILTER

For fabrication details refer attached GA Drawing

It is required for the primary filtration of raw honey coming from the outlet of de-crystallizer chambers.

Each de-crystallizer shall have its own gravity filter.

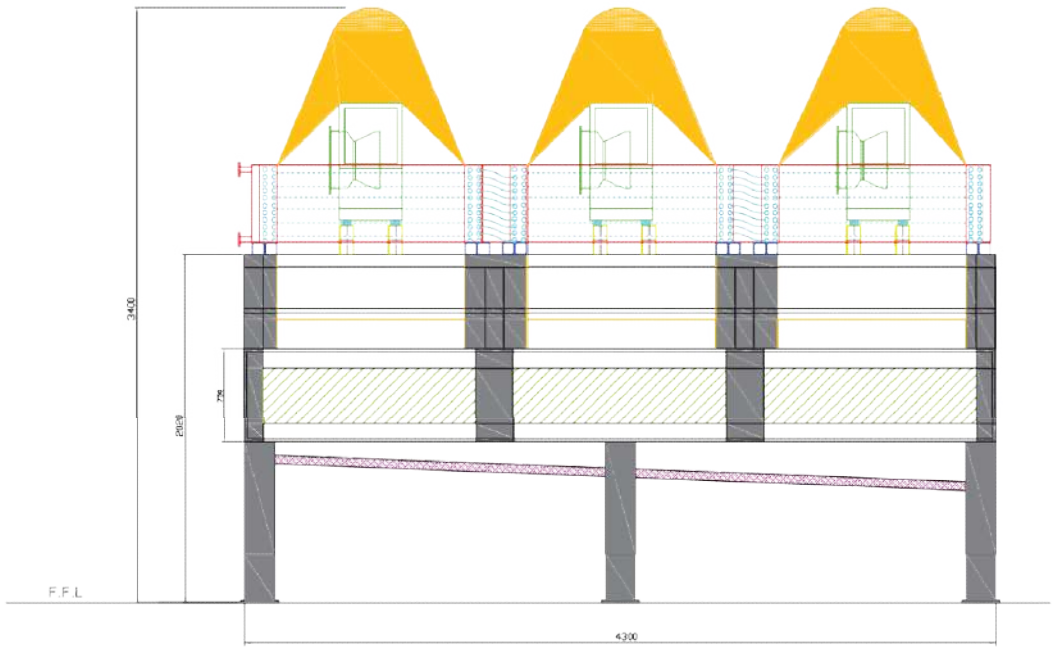
The main housing should have a trough measuring 1500mm X 750mm X 750mm constructed of 2mm thick SS 304 with 2 no.'s perforated basket sized and fitted in the order of one over another in such a way that first basket performs coarse filtration & second basket performs finer filtration. The movement of honey from one basket to another basket and further to the trough is by the force of gravity only.

The coarse filter basket shall be at least 1mm thick have perforations of 5mm dia and fine filter basket shall also be at least 1mm thick but have perforations of 2 mm dia.

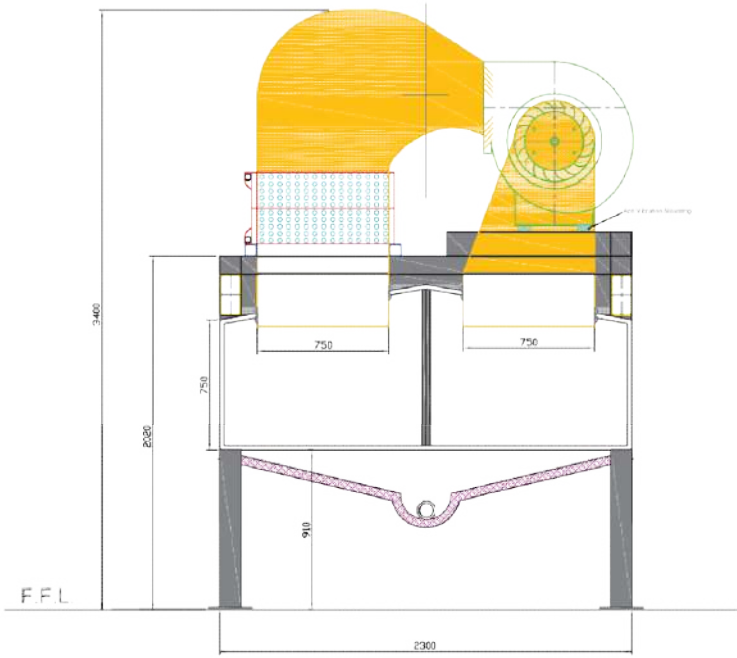
Each gravity filter shall be provided with 80mm flanged outlet, the location of which should be such that both PP and SS valves could be used.

Each gravity filters shall be provided with at-least 4 legs of suitable size in order to raising the trough above the floor for ease of washing.

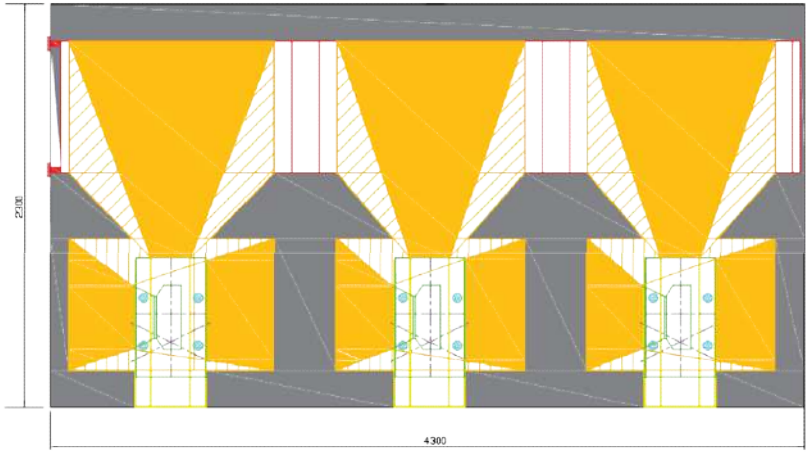
One number of gravity filter is required at each honey processing center.



Front View



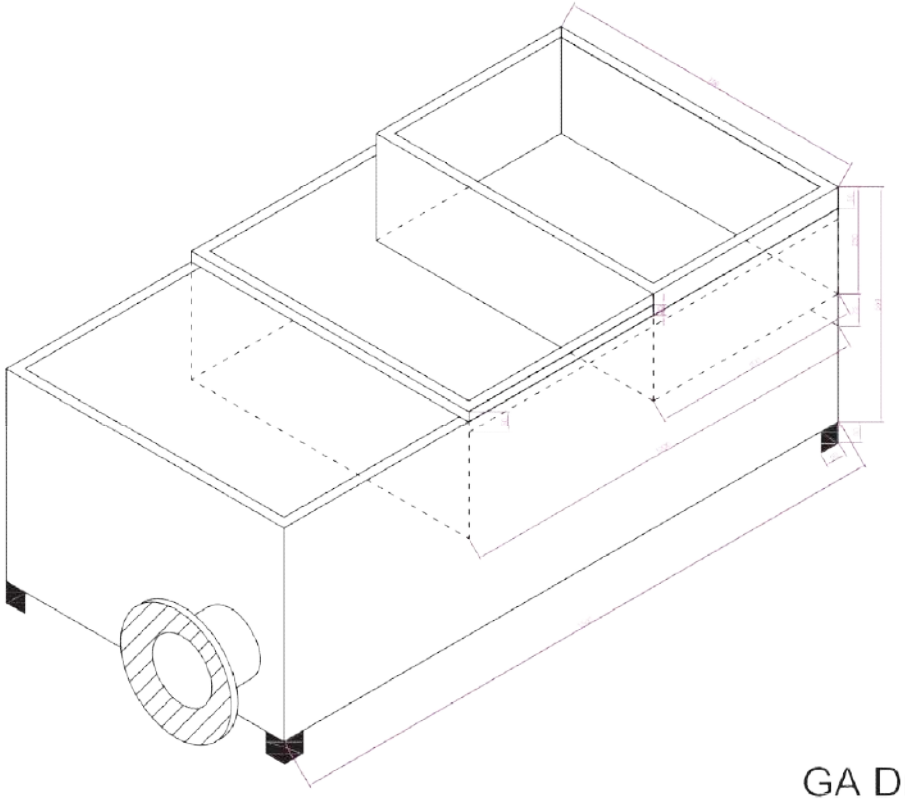
Side View



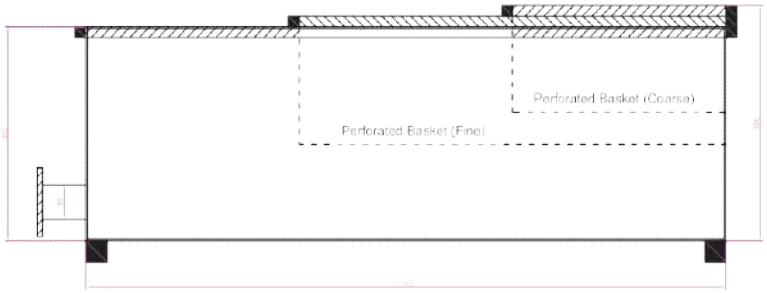
Plan View

G.A. Drawing of De-crystallizer for Buckets

Title : G.A. Drawing of De-crystallizer for Buckets			
Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.			
Marienta	Marienta India Pvt. Ltd.		
DRAWN BY	R. Singh	17/06/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (NAFED), New Delhi
CHECKED BY	V. Kumar	18/06/2021	
APPROVED BY	V. Kaul	18/06/2021	SCALE: NTS / REV.
DRG. NO: E - 2106-10 - TENDER E2 PART - 01			0



Isometric View



Sectional View

GA Drawing of Gravity Filter

Description	MoC	Thickness
Trough	SS 304	2 mm
Perforated Basket (Coarse)	SS 304	1 mm
Perforated Basket (Fine)	SS 304	1 mm

NOTES:

i. All dimensions are in mm unless otherwise stated.
ii. All internal surfaces mirror polished to 240 grit.
iii. All external surfaces mirror finished to 180 grit.

Title : G.A. Drawing of Gravity Filter

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd.

DRAWN BY	R. Singh	17/06/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (NAFED), New Delhi	
CHECKED BY	V. Kumar	18/06/2021		
APPROVED BY	V. Kaul	18/06/2021	SCALE: NTS	REV
DRG. NO: E - 2106-10 - TENDER E2- 02				0

NAFED

TECHNICAL SPECIFICATIONS SHEET FOR HONEY DE-CRYSTALLIZER FOR DRUMS

A. Definition:

The purpose of the equipment is to melt raw honey stored in 200 liter Metal or plastic drums or any other container received from the beekeepers. It has been found through experiences that honey collected from the beekeepers consists of bees wax, impurities dust etc., all these tend to make it more thick and during winter season highly crystallized together with the sucrose component. The degree of crystallization is a function of ambient temperature & type of honey. DC equipment marks the first step in the processing of honey. Honey received from Bee Farmers is molten by applying controlled heat in terms of temperature and air flow in DC chambers. Molten honey is subjected to filtration procedures using various type of filters like gravity filter, centrifuge or other suitable type of filters, and stored in Bulk Storage Tanks for further processing.

B. Heating System:

The heating system for the DC shall have automatic controls for temperature control. Preferred heating medium for the chamber shall be hot water-air system based on forced convection through finned tube radiator using centrifugal blower system. The air temperature inside the chamber shall under no circumstances cross the upper limit of 95 Deg C and shall be achieved using hot water in requisite quantity at a pressure of 1.5 Bar or lower.

C. Capacity:

DC will have a capacity to hold and melt at least honey in 4 drums of 200 liters i.e. 1,200 Kg of raw honey in a process cycle of 60 minutes each and loading/unloading cycle of 15 minutes each. The hourly capacity shall be 1.0 – 1.2 MT of melted raw honey.

D. Number Required:

At each processing center two number DC for Drums is required to be installed to achieve the proposed output capacity without a break.

E. Material of Construction:

All the product contact part will be made in SS 304 and the support structure can constructed in SS 304 clad mild steel members.

F. General Arrangement / Brief Description

The DC consists of four major components viz;-

1. **Melting Chambers with insulation doors and grated metal floor** on which the honey drums will be placed in inverted position. Bottom of the chamber will be a hemi-cylindrical jacketed tank which is slightly sloped towards the outlet side to ensure better flow-ability of honey. Each DC shall be a non partitioned chamber with only length wise partition for aiding air circulation (Please refer to the GA drawing.)

2. **Finned Tube Hot Water Radiator:** Finned tube radiators shall have hot water box with tube sheet for mounting suitable number of tubes on one side and condensate box with matching tube sheet on other side. The radiator should be able to withstand a pressure of 3.0 bar although the operational hot water will only be used @ 1.5 Bar. Main function of the Finned Tube Radiator is to heat air to requisite process temperatures by forced convection. The design should be compact and can be multi-layer. The MOC shall be only SS304 for the tubes, fins, tube sheet and fame in contact with air.

3. **Centrifugal Blower:** Inside the DC chamber two no.'s suitable similar blower for circulation of hot air will be installed. One blower will be placed on top and other one on bottom to achieve uniform mixing. (Please refer to the GA drawing.)

4. **Control Panel:** Temperature sensors for air inlet, air outlet and product are to be placed at all suitable location so that all the temperatures can be monitored for the regulation of steam flow in order to adhere to the process parameters w.r.t air and product temperature. The control panel shall have controllers and indicators to show all process parameters, contactors and push buttons for blowers, controls for steam solenoid valves.

G. MAJOR COMPONENT SPECIFICATIONS:

1. Dimensions: The dimension of the equipment is 2.4 meter (length) x 1.5 meter (width) x 2.0 meter (height). The chamber floor for keeping inverted drums is at a height of 750 mm from FFL. Please refer to the GA drawing for more information.

   For further details please refer to the GA drawing for de-crystallizer.

2. Hot Water Radiator:

i.	Number of	:	Two (2) in each DC
ii.	Type	:	Finned Tube Type Air Heater
iii.	Capacity	:	37,500 K Cals/hr
iv.	Air Flow	:	6,000 CFM @ 80^0 C
v.	Air Inlet/ Outlet Temp	:	80^0 C & 90^0 C
vi.	Heating Media	:	Hot water @ 1.5 bar g - 111 ^{0}C
vii.	Hot Water Circulation	:	About 6,750 liter / hr
viii.	Air Pressure Drop	:	Less than 25 mm WC
ix.	Finned Tubes	:	*Vendor design in SS304 material*
x.	Fin OD	:	--do--
xi.	No. of Tubes	:	--do--
xii.	No. of Rows	:	--do--
xiii.	Tube-sheet	:	--do--
xiv.	Body	:	--do--
xv.	Face Area	:	--do--
xvi.	Overall size Depth as per *Vendor Design*	:	2000mm (L) x 400mm (W)
xvii.	In/Out Connections	:	*Vendor design in SS304 material*
xviii.	Testing	:	Tube side hydro tested @ 5 Kg/ sq. cm

3. Axial Fan Blower:

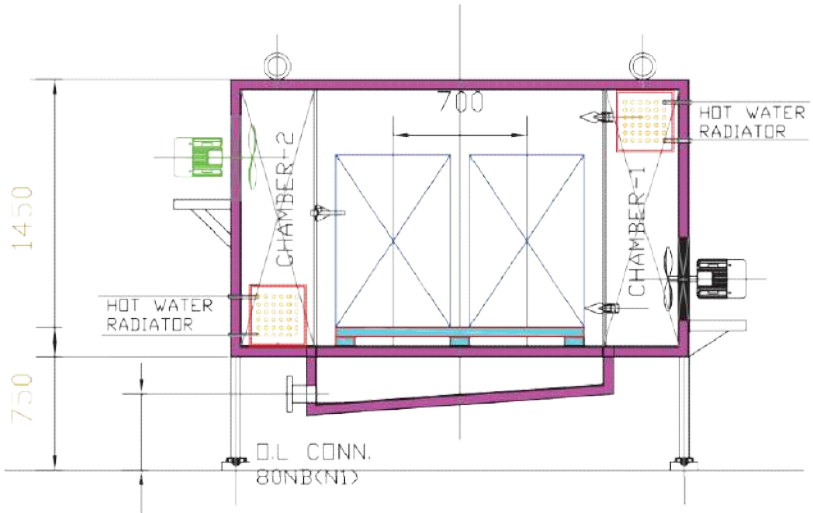
i.	Number of	:	2 in each DC
ii.	Capacity	:	3,000 CFM
iii.	Static Pressure	:	50 MMWC
iv.	Application	:	Hot Air circulation
v.	Radiator Temp.	:	110° C
vi.	Motor	:	2HP/4P/3PH/50 HZ
vii.	Type of blower	:	Axial Fans, Cross Mounted
viii.	Motor Make	:	Crompton/ABB/Havells
ix.	MoC	:	SS 304

H. FINISH

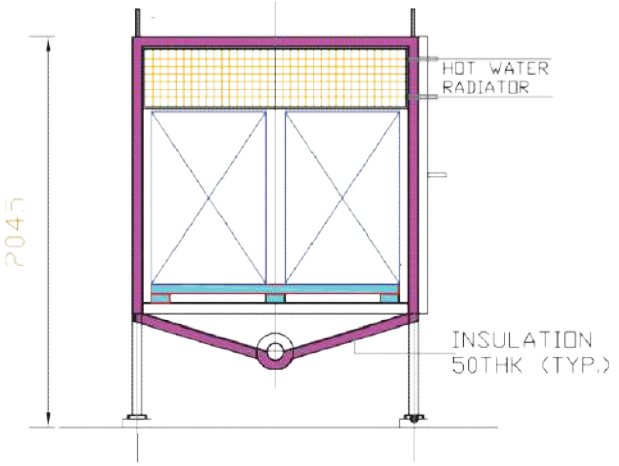
a. All internal surface mirror polished
b. All external S.S. surfaces matt finished
c. All M.S. Surfaces gave one coat of red oxide primer and 2 coats of High Temperature Aluminium Paint

I. TESTING

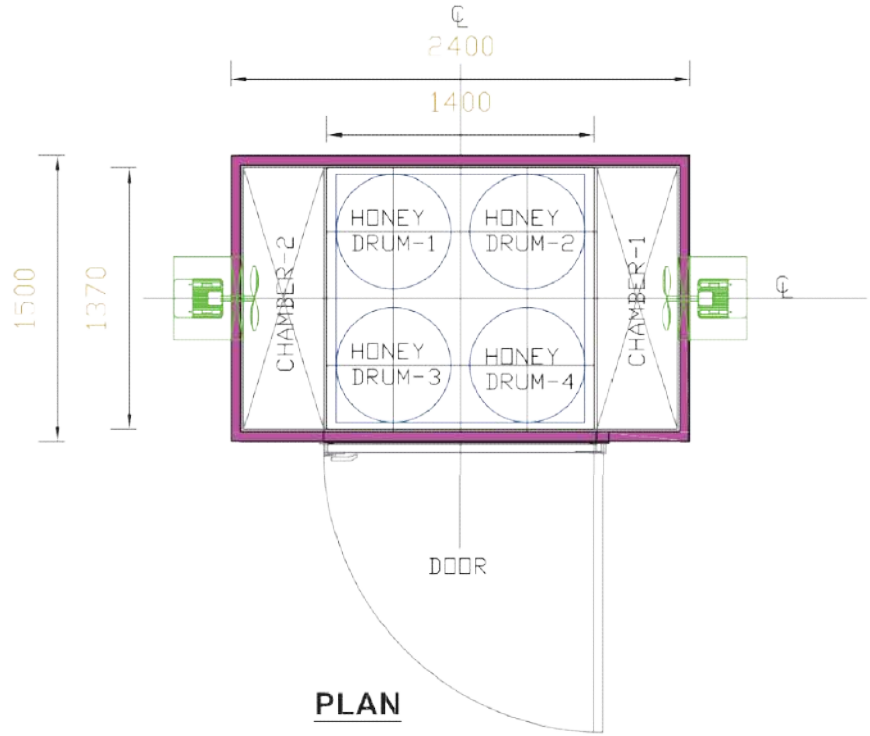
a. Chemical all elements for S.S. 304
b. Holding Tub full water filled
c. Jacket hydro test at 3 kg. / sq.cm.



FRONT ELEVATION



SIDE ELEVATION



PLAN

G.A. Drawing of De-crystallizer for Drums

Title : G.A. Drawing of De-crystallizer for Drums				
Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.				
Mariental			Mariental India Pvt. Ltd.	
DRAWN BY	R. Singh	17/06/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (N.A.F.E.D.), New Delhi	
CHECKED BY	V. Kumar	18/06/2021		
APPROVED BY	V. Kaul	18/06/2021	SCALE: NTS	REV
DRG. NO: E - 2106-10 - TENDER E2 PART 2- 01				0

NAFED

TECHNICAL SPECIFICATIONS SHEET FOR 20 KL HONEY HEATING / COOLING TANK WITH AGITATOR

SPECIFICATIONS OF VESSEL

i. CAPACITY : 20 KL gross with suitable agitator mounted

ii. NUMBER OF VESSELS : 4 no.'s

ii. SHORT DESCRIPTION

Vertical Cylindrical shell with welded dish bottom, open top with bolted flat lid and top mounted agitator. Heating/ cooling jacket on one third shell and bottom dish-end. The vessel shall be self supported with three radial leg supports.

iii. M.O.C.

a. Shell, bottom dish, top lid, body flange liner and nozzles on top lid, thermo well and drain S.S. 304 quality.
b. Jacket shell, Jacket cone, body flange lug supports, jacket spiral/stiffener, Mild Steel

iv. MECHANICAL DETAILS

a. Shell ID 2600 mm
b. Shell height 3520 mm
c. Bottom dish-end thickness 8 mm
d. Shell thickness 6 mm, 5 mm and 4 mm at different height (Please refer the GA drawing for details)
e. Top lid thickness 4 mm
f. Jacket plate thickness 6 mm
g. Body flange 50 wide x 12 thick
h. Body flange liner 25 wide x 3 mm thick
i. Jacket ID 2700 mm
j. Jacket shell height 1200 mm

v. NOZZLES

a. Tank inlet 80 NB
b. Tank outlet 80 NB x 2 Nos.
c. Tank Vent 50 NB
d. Jacket inlet 40 NB
e. Jacket outlet 40 NB
f. Level indicator 40 NB x 2 Nos.

g. Manhole 450 mm dia
h. Thermo well 40 x 25 NB
i. Suction vent 200 NB
j. Light glass 150 mm
k. Sight glass 150 mm

vi. ACCESSORIES

a. Fixed nut bolds for body flange
b. 2400 mm long polycarbonate tube type level indicator with 40 mm O.D. Polycarbonate tube with drain cum sample cock.
c. Pressure relief valve, pressure gauge and vent cock on jacket.

vii. FINISH

a. All internal surface mirror polished
b. All external S.S. surfaces matt finished
c. All M.S. Surfaces gave one coat of red oxide primer and 2 coats of synthetic enamel.

viii. TESTING

a. Chemical all elements for S.S. 304
b. Tank full water filled
c. Jacket hydro test at 3 kg. / sq.cm.

NAFED

SPECIFICATIONS OF AGITATOR ASSEMBLY

i. **Tank Capacity** : 20 KL gross

ii. **Fluid** : Honey

ii. **Number of Agitator reqd.** : 4 no.'s

ii. **SHORT DESCRIPTION**

Energy applied by impeller produces a pumping effect and a velocity head in the fluid. Mixer design should optimize the energy distribution to the impeller geometry & fluid's physical properties.

iii. **Detailed Specifications for the Agitator Assembly**

A. Tank Details

ID	: 2600 mm
St. Ht	: 4000 mm
Top	: Flat
Bottom	: Dish
Operating Volume	: 20 m3

B. Fluid Details

Sp. Gr	: 1.4
Viscosity	: 1500 cPs

C. Agitator Assembly Specifications

a.	Motor	: 3.7 kW / 1440 rpm TEFC IP55
b.	Drive	: Helical of reputed Indian make
c.	Impeller	: 2 x of diameter 1350 mm 1 x Kicker of dia. 950 mm
d.	Mixer Speed	:~ 45 rpm
e.	Shaft Power	: 2.771 HP
f.	Flow	: 144.149 m3/min
g.	Tip Speed	: 3.18 & 2.14 (Kicker)
h.	Shaft Sealing	: Stuffing box
i.	Wetted Parts	: SS304 (Shaft + Impeller)

j. Non Wetted Parts : MS
k. Coupling : Rigid + Flexible
l. Mounting : Suitable ANSI 150 lbs

iv. Scope of Supply

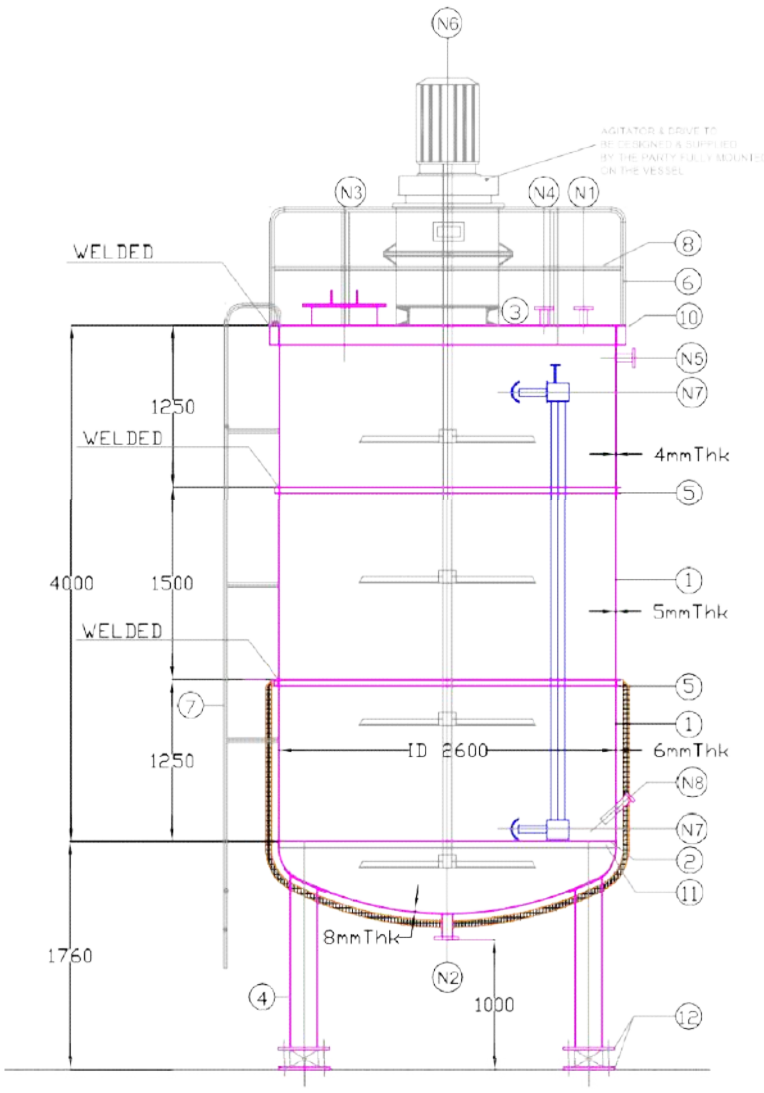
i. Motor – TEFC/ IP55/ 415v/3ph/50Hz/ STD/ 4 Pole (Make – CGL / BBL or Equivalent)
ii. Gearbox - (Make – BTPL/ SEW or Equivalent)
iii. Flexible Coupling (Make – Lovejoy or Equivalent)
iv. Rigid and Removable Coupling (Make – RVSL or Equivalent)
v. Agitator Mounting Stool with MOC as MS
vi. Agitator Mounting counter Flange for Tank
vii. Shaft and Impeller
viii. Stuffing Box
ix. In tank Hardware

vii. FINISH

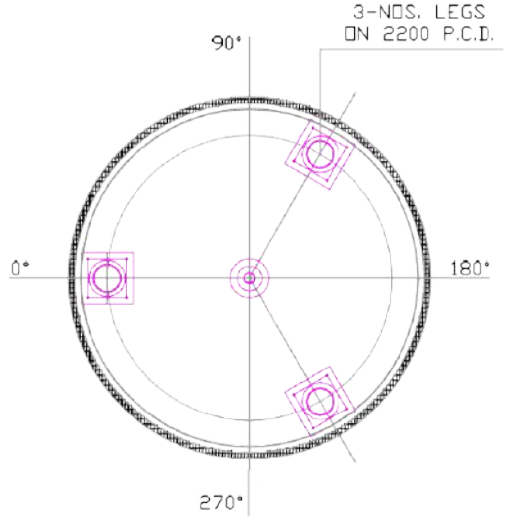
i. All internal surface mirror polished
ii. All external S.S. surfaces matt finished
iii. All M.S. Surfaces gave one coat of red oxide primer and 2 coats of synthetic enamel.

viii. TESTING

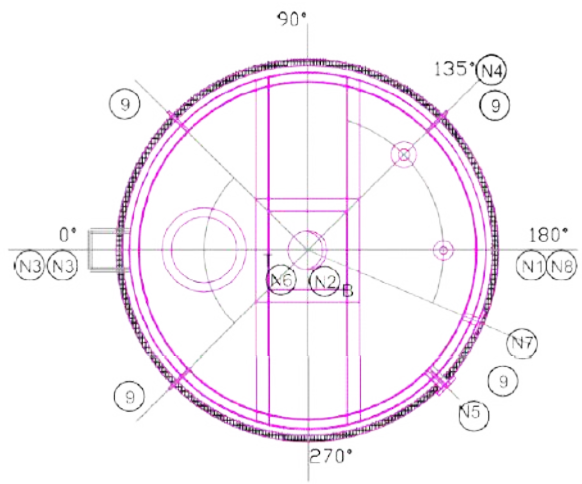
i. Chemical all elements for S.S. 304
ii. Tank full water filled



20 KL TANK SECTION VIEW



FOUNDATION PLAN



PLAN
(NOZZLE ORIENTATION)

S NO	DESCRIPTION	QTY	SIZE	REMARKS
12	BASE PLATE 10THK	6	400SQ	S.S-304
11	PAD PLATE 10mmthk	3	350SQ	S.S-304
10	TOP RING	1	150x75	S.S-304
N8	THERMOWELL	1	ø32	
N7	LEVEL INDICATOR	2	ø40	GLASS TYPE
N6	OPENING FOR AGI.	1	***	
N5	OVER FLOW	1	ø80	S.S.-304
N4	AIRVENT	1	ø80	S.S.-304
N3	MAIN HOLE	1	ø600	S.S.-304
N2	OUTLET	1	ø80	S.S.-304
N1	INLET	1	ø50	S.S.-304
9	LIFTING LUGS	4	25mm	S.S.-304
8	RAILING SOLID ROD	1	ø16mm	S.S.-304
7	LADDER	1	ø25PIPE	S.S.-304
6	RAILING SUPPORT	8	ø40xSCH20	S.S.-304
5	STIFFENER	2	50x30	M.S.
4	LEGS	3	ø200PIPE	S.S.-304
3	TOP COVER	1	4mmTHK	S.S.-304
2	DISHED PLATE	1	8mmTHK	S.S.-304
1	SHEELL	1	4mmThk 5mmThk 6mmThk	S.S.-304

Title : G.A. Drawing of 20 KL Honey Tank

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

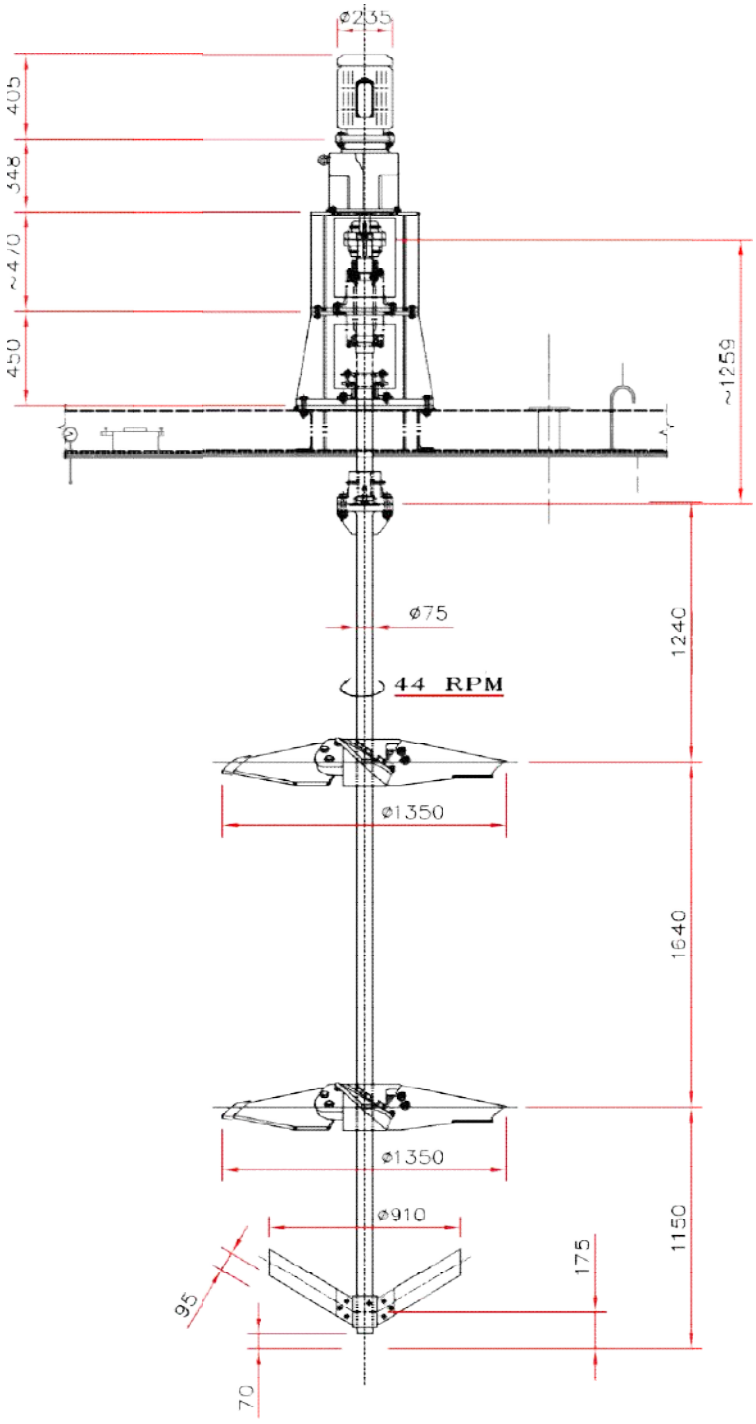
Mariental — Mariental India Pvt. Ltd.

DRAWN BY		
CHECKED BY		
APPROVED BY		

SCALE: NTS

REV

DRG. NO: E : TENDER F.A PART I.A



GA Drawing of Agitator Assembly
for 20 KL Tanks

Title	: G.A. Drawing of Agitator assembly for 20 KL Tanks
Project	: Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.
Mariental	Mariental India Pvt. Ltd
DRAWN BY	27/08/2021
CLIENT:	

NAFED

TECHNICAL SPECIFICATIONS SHEET FOR 5 KL HONEY TANK

i. CAPACITY : 5 KL gross

ii. NUMBER OF VESSELS REQUIRED: Two (2) no.'s

ii. SHORT DESCRIPTION

Vertical Cylindrical shell with welded conical bottom, open top with bolted flat lid. The vessel shall be self supported with three radial leg supports.

iii. M.O.C.

Shell, bottom dish, top lid, body flange liner and nozzles on top lid, thermo well and drain S.S. 304 quality.

iv. MECHANICAL DETAILS

a. Shell ID	1600 mm
b. Shell height	2400 mm
c. Bottom cone thickness	6 mm
d. Shell thickness	5 mm (Please refer the GA drawing for details)
e. Top lid thickness	4 mm
f. Body flange	50 wide x 12 thick
g. Body flange liner	25 wide x 3 mm thick

v. NOZZLES

a. Tank inlet	80 NB
b. Tank outlet	80 NB x 2 Nos.
c. Tank Vent	50 NB
d. Level indicator	40 NB x 2 Nos.
e. Manhole	450 mm dia
f. Thermo well	40 x 25 NB
g. Suction vent	200 NB
h. Light glass	150 mm
i. Sight glass	150 mm

vi. ACCESSORIES

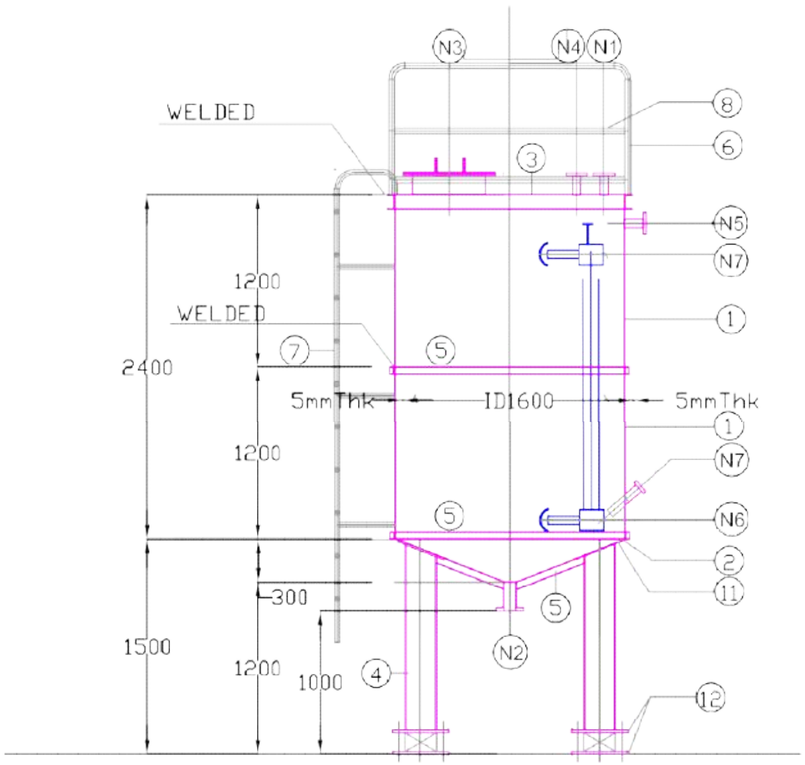
a. Fixed nut bolds for body flange
b. 1600 mm long polycarbonate tube type level indicator with 40 mm O.D. Polycarbonate tube with drain cum sample cock.

vii. FINISH

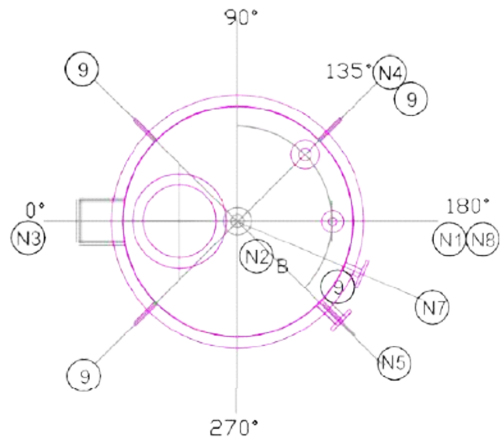
a. All internal surface mirror polished
b. All external S.S. surfaces matt finished
c. All M.S. Surfaces gave one coat of red oxide primer and 2 coats of synthetic enamel.

viii. TESTING

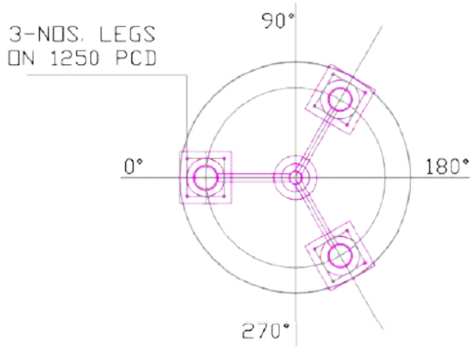
a. Chemical all elements for S.S. 304
b. Tank full water filled.



ELEVATION



NOZZLE ORIENTATION



FOUNDATION PLAN

GA Drawing of 5 KL Honey Tanks

S NO	DESCRIPTION	QTY	SIZE	REMARKS
13	BASE PLATE 10THK	6	360SQ	S.S-304
12	PAD PLATE 5mmthk	3	ø270	S.S-304
11	50SQ PIPE STIFF.	3	5mmTHK	S.S-304
10	TOP RING	1	100x50	S.S-304
N7	THERMOWELL	1	ø32	
N6	LEVEL INDICATOR	2	ø40	GLASS TYPE
N5	OVER FLOW	1	ø80	S.S.-304
N4	AIRVENT	1	ø80	S.S.-304
N3	MAIN HOLE	1	ø500	S.S.-304
N2	OUTLET	1	ø80	S.S.-304
N1	INLET	1	ø50	S.S.-304
9	LIFTING LUGS	4	25mmThk	S.S.-304
8	RAILING SOLID ROD	1	ø16mm	S.S.-304
7	LADDER	1	ø 25PIPE	S.S.-304
6	RAILING SUPPORT	6	ø40xSCH20	S.S.-304
5	STIFFENER	2	50x30x5Thk	M.S.
4	LEGS	3	ø150 PIPE	S.S.-304
3	TOP COVER	1	4mmThk	S.S.-304
2	BOTTOM CONE	1	5mmThk	S.S.-304
1	SHEELL	1	5mmThk 5mmThk	S.S.-304

Title : G.A. Drawing of 5 KL Honey Tank

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental — Mariental India Pvt. Ltd.

DRAWN BY		
CHECKED BY		
APPROVED BY		SCALE: NTS

DRG. NO: E ... TENDER ... REV

NAFED

TECHNICAL SPECIFICATIONS FOR INLINE DUPLEX BAG FILTER & SPARKLER FILTER

A. Filtration System:

The Filters are required to filter raw and processed honey before storing it in the tanks prior and post processing. The filtration is done at multiple stages like Coarse Filtration is done using "Gravity Filters" and Fine Filtration is done using "Duplex bag Filters". The tertiary level filtration used in retail honey products is achieved using a "Sparkler Filter".

Duplex Bag Filters shall be mounted on Raw and Processed Honey Storage Tank inlets.

Sparkler Filter shall be used for tertiary filtration before settling tank in retail packing of honey line.

B. Number Required:

Inline Duplex Bag Filter:	Five (5) set
Sparkler Filter:	One (1) set

C. Detailed Specifications:

1. ***Inline Duplex Bag Filter***

For complete fabrication details refer attached GA Drawing

a.	Material of Constructions	: SS 304 / 316
b.	Shell ID	: 300 mm
c.	Shell Height	: 450 mm
d.	Shell Thickness	: 10 SWG
e.	Perforated Filter Basket ID	: 200 mm
f.	Perforated Basket Thickness	: 10 SWG
g.	Perforation Size	: 3 mm
h.	Housing Flange thickness	: 10 mm
i.	Locking mechanism	: Using eye bolts & ring nuts
j.	Filter Element	: Double woven poly-propylene filter bag
k.	Filter Hold down	: SS Top Disk Ring with hold down handle.
l.	Filter element mesh rating	: 80 mesh (40,60 & 100 mesh as spare)

m.	Gasket material	: Food grade silicone rubber
n.	No. of housing with basket	: Two per set
o.	Valve	: 80 NB Ball valve, SS 304
p.	No. of valves per duplex	4
q.	All piping	: SS 304
r.	Support Lug	: Yes, as per requirement

2. ***Sparkler Filter***

For complete fabrication details refer attached GA Drawing

a. MOC

i) All contact parts like main shell, filter plates, top cover, perforated plates, tie rods, centre rod in SS 304 quality.
ii) All non contact parts like jacket, bottom support legs, handle, eye bolts with wing nuts in SS 304 quality.
iii) All gaskets silicon rubber.

b. Mechanical Details

i)	Filtration area	3.7 Sq. mtrs.
ii)	Cake Holding Capacity Maximum Functional:	125 Lts. 80 Lts.
iii)	Product flow rate	3000 lts. per hour.
iv)	Diameter of plates:	24 ”
iv)	No of plates:	24
v)	Thickness of plates:	2 mm
vi)	Height of plate:	38 mm
vii)	Thickness of ring:	8 mm.
viii)	Diameter of filter Area:	570 mm .
ix)	Perforated screen:	1.5 mm thick with 3 mm dia
x)		perforation @ 6 mm pitch
xi)	Dia of Spacer:	70 mm
xii)	Sealing Area:	150 dia x 5 mm thick silicon rubber.
xiii)	Cartridge bottom plate:	19 mm thk.
xiv)	Cartridge Top closer plate ring:	12 mm thick.
xv)	Thickness of Shell :	4 mm
xvi)	Jacket thickness :	4 mm

c. Nozzles

i)	Inlet	40mm TC.
ii)	Outlet	40mm TC
iii)	Drain	25mm BSP
iv)	Safety valve	19mm BSP
iv)	Vent valve	15mm BSP
v)	Pressure gauge	15mm BSP

d. Compulsory Accessories

i) One set of Non woven washable polypropylene pads. 20 micron.
ii) Pressure gauge 4" dial
iii) Pressure safety valve
iv) Vent cock
v) 11/2" TC inlet ball valve
vi) 11/2" TC outlet ball valve
vii) 1" BSP drain ball valve.
viii) Leg support and castor wheels.

e. Lobe Pump & Common Trolley

i.	Type –	Lobe Pump. With two tri-lobes Single stage.
ii.	Maximum head	50 mtrs.
iii.	Flow rate	3000 lts. per hour
iv.	Motor	5 HP/Flameproof/2850 RPM/ CROMPTON/ Eqvt. through Gear box to give output RPM approx 700.
v.	Contact parts	S.S. 304
vi.	Shaft sealing by	single dry mechanical seal.
vii.	Seal faces	TC Vs C.
viii.	Inlet /Outlet size –	40mm
ix.	Mounted on common skid of filter.	

f. Finish

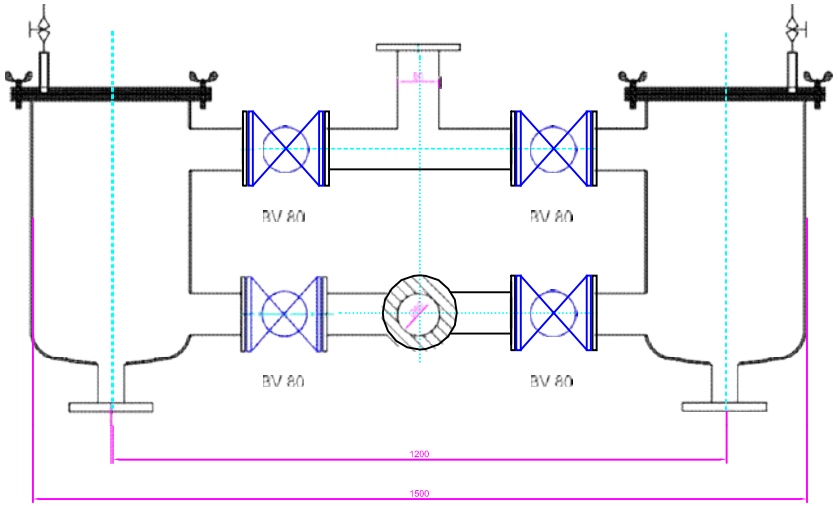
i. All surfaces mirror polished to 240 GRIT

g. Design Parameters

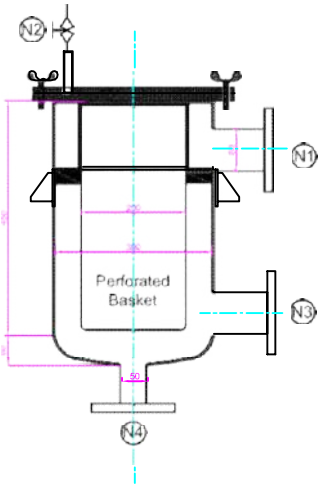
i)	Design pressure shell	3.5 kg / Sq. cms.
ii)	Hydro test pressure shell	5 kg/sq.cms.
iii)	Design temperature shell & Jacket	100^{O}C.
iv)	Design pressure Jacket	3.5 kg / Sq. cms.
iv)	Hydro test pressure Jacket	5 kg/sq.cms.

h. Documents with supply

i) Material test certificates for main shell, plates, perforated plates.
ii) As Built GA drawing.
iii) Hydro test certificate for main shell .
iv) Inspection / Calibration Report for pressure gauge.
v) Operation and Maintenance manual.

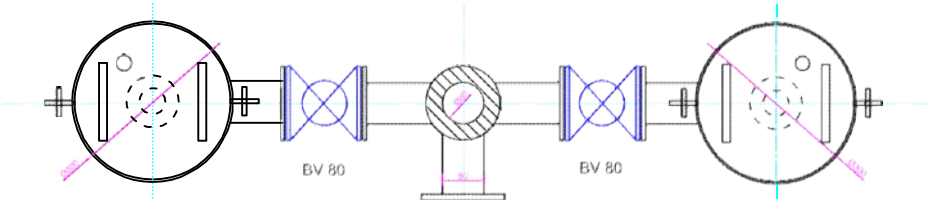


Front View



Side View

Nozzle Schedule		
No.	Size	Description
N1	80 NB	Inlet
N2	15 NB	Vent with valve
N3	80 NB	Outlet
N4		



Top View

GA Drawing of Duplex Bag Filter

S. No.	Description	MoC	Details
1	Housing Shell	SS 316	Ø 300 ID x 450 Ht. x 10 SWG
2	Dish-ends	SS 316	Ø 300 ID x 10 SWG
3	Basket Shell	SS 316	Ø 200 ID x 350 Ht. x 10 SWG
4	Basket Dish	SS 316	Ø 200 ID x 10 SWG
5	Basket Flange	SS 316	Ø 208 ID x 334 O/D x 10 SWG
6	Housing Flange	SS 316	Ø 308 ID x 388 O/D x 12 THK.
7	Eye Bolt with wing nut	SS 316	M12 x 50 Lg., 8 no.'s
8	Filter bag with ring	PP/SS 316	
9	Envelope Gasket	Silicon	Ø 300 ID x 340 O/D x 16 THK.
10	Top Lid lifting handle	SS 304	125 x 50 x Ø 10 Rod, 2 no.'s
11	Support Lug	SS 304	
11	Ball Valve	SS 304	4 no.'s
11	Interconnecting piping	SS 304	

Title : G.A. Drawing of Duplex Filter

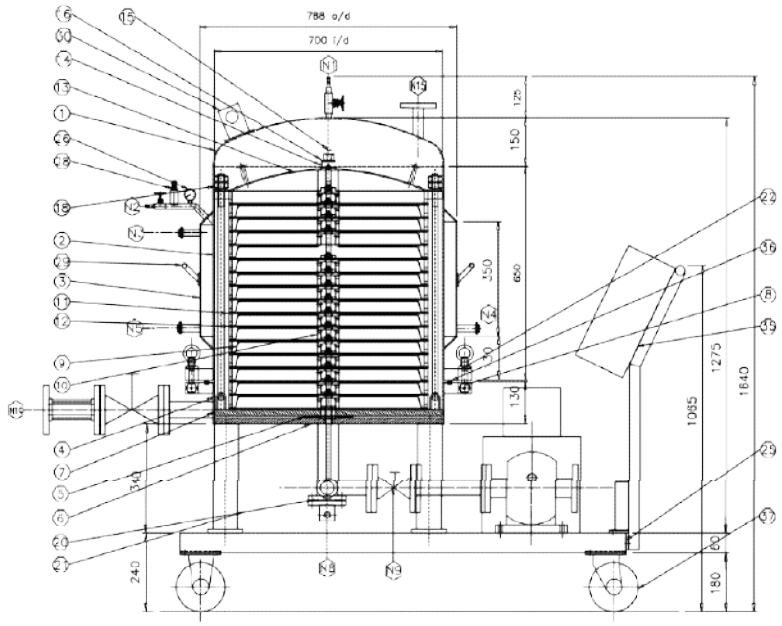
Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental Mariental India Pvt. Ltd.

DRAWN BY	R. Singh	29/06/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (NAFED), New Delhi	
CHECKED BY	V. Kumar	29/06/2021		
APPROVED BY	V. Kaul	29/06/2021	SCALE: NTS	REV.
DRG. NO: E - 2106-10 - TENDER F4 - 01				0

OTES:

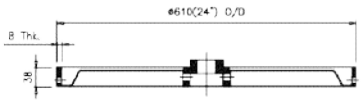
- All dimensions are in mm unless otherwise stated.
- All internal surfaces mirror polished to 240 grit.
- All external surfaces mirror finished to 180 grit.



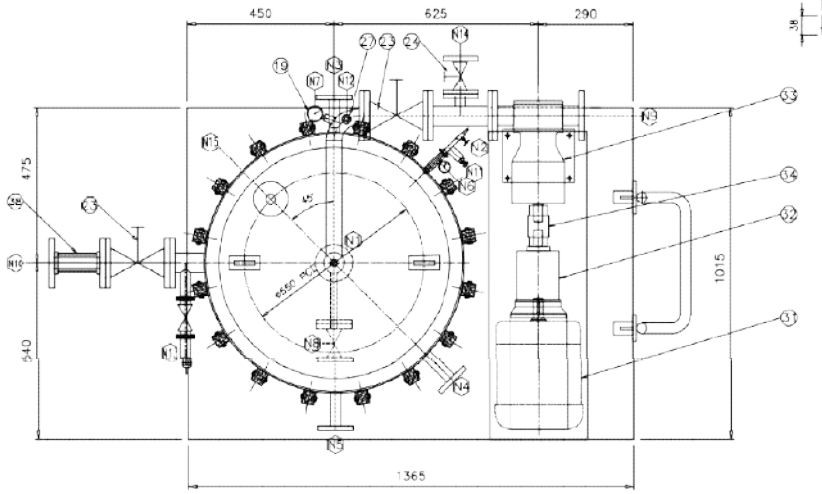
DESIGN PARAMETER:-	
Design Pressure Shell	3.5 Kg./ Sq.cms.
Hydro Test Pressure Shell	5 Kg./Sq.cms.
Design Pressure Jacket	3.5 Kg./ Sq.cms.
Hydro Test Pressure Jacket	5 Kg./Sq.cms.
Design Temperature Shell	100°C
Design Temperature Jacket	100°C

NOZZLE SCHEDULE

No.	SIZE	DESCRIPTION	QTY.	REMARK
N1	1/2" BSP	AIR VENT	1No.	SERRATED NOZZLE WITH VALVE
N2	1/2" BSP	VENT (Jacket)	1No.	SERRATED NOZZLE WITH VALVE
N3	1" NB	OUTLET(Jacket)	1No.	ASA@150 SORF.
N4	1" NB	INLET(Jacket)	1No.	ASA@150 SORF.
N5	1" NB	DRAIN (Jacket)	1No.	ASA@150 SORF.
N6	1/2"(M) BSP	PRESSURE GAUGE	1No.	@100 DIAL 0 TO 7Kg./Sq.cm.(For JACKET)
N7	1/2"(M) BSP	PRESSURE GAUGE	1No.	@150 DIAL 0 TO 7Kg./Sq.cm.(For SHELL)
N8	1" NB BALL VALVE	DRAIN WITH VALVE	1No.	TC TYPE WITH SERRATED NOZZLE
N9	2" NB BALL VALVE	INLET	1No.	ASA@150 SORF.
N10	2" NB BALL VALVE	OUTLET	1No.	ASA@150 SORF.
N11	1/2" BSP	SAFETY VALVE	1No.	1/2" BSP SOCKET
N12	1/2" BSP	SAFETY VALVE	1No.	1/2" BSP SOCKET
N13	1/4" BSP BALL VALVE	SAMPLE NOZZLE	1No.	WITH BALL VALVE
N14	1" NB BALL VALVE	TRANSFER LINE	1No.	WITH BALL VALVE
N15	1" NB	NITROGEN PURGING	1No.	ASA@150 SORF.



⑨ FILTER PLATE



No	DESCRIPTION	Qty.	MATL.	SIZE
38	FLOW INDICATOR	1No.	GLASS	
37	CASTOR WHEEL	4Nos.	PU Lined	ø150x50
36	MAIN GASKET	1No.	SILICON	750 I/Dx782 O/Dx16 Sqr.
35	F.P. STARTER	1No.		
34	FLEXIBLE COUPLING	1No.	STD	
33	LOBE PUMP	1No.	SS316	
32	GEARBOX	1No.	POWER BUILD-SERIES M, M04203.2, RATIO-2.039:1	
31	MOTOR	1No.	Hindustan	5 HP,1440 RPM,F.P.Foot Mounted.
30	LIFTING HOOK	2Nos.	SS304	
29	HANDLE	2Nos.	SS304	
28	SAFETY VALVE	2Nos.	SS316	1/2" BSP
27	SAFETY VALVE	1No.	SS316	1/2" BSP
26	PRESSURE GAUGE	1No.	SS316	1/4"(M) BSP, ø100 Dial,0 to 7Kg./Sq.cm.
25	TROLLEY	1No.	SS304	
24	BALL VALVE	1No.	SS316	ø1"
23	BALL VALVE	2Nos.	SS316	1 1/2" NB.
22	EYE BOLT,WING NUT & WASHER	16Nos.	SS304	M16
21	SUPPORTING LEGS	4Nos.	SS304	ø76 O/D Pipe
20	GASKET FOR BOTTOM PLATE	1No.	SILICON	6 THK. x 50 I/d x 140 o/c
19	PRESSURE GAUGE	1No.	SS316	3/8"(M) BSP,ø150 Dial,0 to 7Kg./Sq.cm
18	SIDE ROD WITH NUT & WASHER	8Nos.	SS316	M16x4p Squcre Thds.
17	HEX NUT	1No.	SS316	
16	WASHER	1No.	SS316	–
15	CENTRE TIE ROD	1No.	SS316	M16x4p Squcre Thds.
14	TOP BUSH	1No.	TEFLON	PTFE
13	CARTRIDGE TOP DISH	1No.	SS316	–
12	FILTER PAD	16Nos.	PP	3 Thk.xø642
11	SUPPORTING SCREEN	16Nos.	SS316	16 Swg.xø642 o/d.
10	INTER LOCKING CUP	15Nos.	SS316	–
9	FILTER PLATE	15Nos.	SS316	14 SWG.(2mm.Thk.)
8	BODY FLANGE	2Nos.	SS316	20 THK. x 710 I/c x 840 o/d
7	SCAVENGER PLATE	1No.	SS316	19 THK.
6	SHELL BOTTOM PLATE	1No.	SS316	19 THK.
5	SCAVENGER WASHER	1No.	SILICON	6 THK. x 50 I/c x 140 c/c
4	BOTTOM SHELL	1No.	SS316	4 THK.SHEET
3	JACKET	1No.	SS304	4 THK.SHEET
2	SHELL	1No.	SS316	4 THK.SHEET
1	TOP DISH	1No.	SS316	4 THK.SHEET

GA Drawing of Sparkler Filter

NOTES:

i. All dimensions are in mm unless otherwise stated.
ii. All internal surfaces mirror polished to 240 grit.
iii. All external surfaces mirror finished to 180 grit.

Title : G.A. Drawing of Sparkler Filter

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd.

DRAWN BY	R.Kaur	27/05/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (N.A.F.E.D.) New Delhi	
CHECKED BY	V.Kumar	28/05/2021		
APPROVED BY	V.Kaur	28/05/2021	SCALE: NTS	REV.
DRG. NO: E - 2106-10 - TENDER E4 - 02				0

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TECHNICAL SPECIFICATIONS FOR PROGRESSIVE CAVITY PUMP

A. Equipment:

This machine/equipment is required to transfer honey from one equipment to other.

Progressing Cavity Pumps should be capable of use for a broad application range for the gentle and low-pulsation continuous conveyance / transporting of stringy material like Honey under pressure-stable condition. It should also be able to operate as a valve less positive-displacement pump. It should be capable of.

The pumps should have block construction with a flanged drive.

B. Number Required

Number of pumps required.

Capacity	No. of Pumps
36 LPM	5 No.'s

C. Detailed Specifications:

i. Operating Parameters:-

1	Fluid	Honey
2	Pumping Medium Temperature	40 to 60 °C
3	Specific Gravity	1.10 to 1.40 Kg / m3
4	Viscosity at Pumping Temperature	800 to 4000 Cps
5	pH	Neutral
6	Suction Condition / Head	Flooded
7	Discharge Pressure	2-3 Bar

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ii. Pump Parameters:-

1	Flow	2.1 m3/hr
2	Speed (Pump / Motor)	Less than 200 RPM @ 50 Hz
3	Shaft Power	Vendor Design
4	Rated Power	0.75 KW
5	Direction of Rotation (View from D End)	CCW
6	NPSH Required	1.4 m
7	Flow Range	VFD Controlled
8	Suction Position	Vertical
9	Discharge Position	Horizontal

iii. Pump Contruction:-

1	Pump Housing	Stainless Steel 304
2	Rotating Parts	Stainless Steel 304/316
3	Rotor	Stainless Steel 304/316 VCP
4	Stator	Nitrile / Engineering Plastic of suitable grade
5	Shaft Seal	Gland Packing / Lubricated PTFE Yarn Packing
6	Body Seals	Vendor Design
7	Joint	Pin Joint
8	Lantern	Cast Iron
9	Base Plate	Mild Steel
10	Suction Flange (Size / Rating)	DN 65, PN 16
11	Discharge Flange (Size / Rating)	DN 65, PN 16
12	CIP Connection	Yes
13	Counter Flanges	Yes

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iv. Motor:-

1	Make	Nord /SEW or Equivalent
2	Type	Helical Gear Drive, Direct Coupled
3	Model	Vendor Design
4	Efficiency Rating	Eff 2
5	Power	0.75 KW / Vendor Design
6	Mounting	Flange Mounted
7	Voltage	415V / 3 Ph / 50 Hz
8	Protection Class	Minimum IP55
9	Insulation Class	F
10	Variable Frequency Drive	Yes
11	Dry Run protection	Yes
12	Lubricating Oil (In case of Geared Motor)	Mineral Oil

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TECHNICAL SPECIFICATIONS FOR HIGH PRESSURE HOMOGENIZER

A. Equipment Brief:

This machine is required to homogenize honey from different sources and different types in order to make it appear uniform in look, texture and colour.

Homogenization is a fluid mechanical process that involves the subdivision of particles or droplets into micron sizes to create a stable dispersion or emulsion for further processing. It dissociates any lump or coalesced particle in stored honey (that may not be visible to naked eye) utilizing high pressure. It provides improved product stability, shelf life, digestion, and taste. Honey after processing through homogenizer is best suitable for retail packing because it looks uniform in texture and colour and does not settle.

The equipment should have an capacity to process 1,000 lph operating at a pressure of about 600 Bar.

B. Technical Specifications:

The homogenizer should conform to the following specifications:

i.	Flow Rate (based on water)	: 1,000 LPH
ii.	Product to be homogenized	: Honey
iii.	Maximum Working Pressure	: 600 Bar
iv.	Process Stages	: Two stage (manual operation)
v.	Flowability of homogenized honey	: Good
vi.	Temperature Homogenization	: 55 – 60 °C
vii.	MOC for Valve & Valve Seat	: Suitable Grade (preferably Stellite-20 grade)
viii.	Suction/ Discharge Valve	: Special SS ball valve for viscous material
ix.	Suction/ Discharge Valve Seat	: Special alloy steel
x.	Lubrication	: Splash
xi.	Plungers	: Atleast Three, alloy steel
xii.	Frame & Mountings	: M.S. frame with SS enclosures
xiii.	Body	: Spheroidal, Cast Iron
xiv.	Drive Arrangement	: Pulley & V Belt drive
xv.	Installed Power	: As per design

xvi.	Motor Specification	: 1440 RPM TEFC electric motor of Crompton / reputed make
xvii.	Power Rating	: 415 C, 3 Ph, 50 Hz

C. Brief Description of Major Components:-

i. HIGH PRESSURE PUMP BLOCK (CHAMBER)

The High Pressure Pump block (Chamber) should be made of forged single piece special alloy steel (174ph) to with stand high pressure with minimum pockets for good sanitary design and CIP. It is tested with ultra sound.

The Chamber Block should be housed with removal and replaceable type Suction and Delivery Valve and Valve Seats.

The gasket coming in contact to the product shall be **food grade, non-toxic, fat resistant and non-absorbent** with smooth surface.

ii. CRANK CASE (POWER END)

Crank Case of the Homogenizer should be made of suitable material (preferably **Cast Iron)** and mounted on fabricated rugged frame. It is *rugged in construction and easy for maintenance*. The Crank Case houses the crank shaft, connecting rod and bearings.

iii. HOMOGENSING HEAD

Homogenizing Head should be at least Two stage, Manually Operated. The Homogenizing Valve and valve seats for both 1st and 2nd stage should be made of suitable materials like Satellite Grade-20 material.

The materials used should be energy saving, wear and abrasion resistant and of interchangeable and replaceable type.

iv. PLUNGERS

Plungers should be made out of special grade stainless steel alloy, hardened and ground with precision to matching dimensions.

v. PLUNGER PACKING

Suitable Plunger Packing should be provided to prevent any leakage and it easily replaceable. Cooling system should be done preferably by Chilled Water.

The Plunger seals provided should be of Food Grade quality and able to with stand a temperature upto 75 Deg.

vi. POWER TRANSMISSION

The primary transmission of power in Homogenizer should be be through 'V' belts and pulleys. The shaft with all the pulleys and 'V' belts should be mounted on the main frame and clad with SS shroud. Both the pulleys (i.e. of Motor as well as Homogenizer) should be provided with taper lock bush arrangement.

vii. DRIVE

Drive Motor for the Homogenizer should also be mounted within the Homogenizer main frame inside the SS Shroud. Drive Motor provided should be foot mounted ,Squirrel cage, TEFC, 1440 RPM, 415 Volt, 50 Hz, 3 Phase A/C with Class F insulation and with IP-55 Protection . it should of reputed make like Crompton / Equivalent .

viii. PRESSURE GAUGES

The homogenizer should be provided with heavy duty Digital Pressure Gauges with Stainless Steel Diaphragm having a measuring and display range of 0- 600 bar.

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Technical Specifications Sheet for

CONTINUOUS AND AUTOMATIC BOTTLE FILLING MACHINE

1. Products to be filled in Bottles

Natural Honey in wide-mouth, specially designed Glass / PET Bottles with Aluminum foil sealed and twist-on cap.

The products are viscous and sticky and are required to be hot-filled..

2. Capacity of Product Filling Machine

i) Natural Honey in 1000 gm bottles produced for a period of 90 days, on two shift basis = 8 to 10 bottles/ minute.

ii) Natural Honey in 500 gm bottles produced for a period of 10 days, on two shift basis = 14 to 16 bottles/ minute

The capacity of the product filling machine shall be 8 to 10 bottles/ minute for bottles containing 1000 gm each and 14 to 17 bottles per minute for bottles containing 500 gm each.

3. Type of Bottles

The bottles shall be Stretch Blow Molded PET Bottles, custom designed for NAFED. The bottles shall be wide mouthed, with seal of printed Aluminium foils and covered with twist-on cap.

4. Type of filling machine required

a) Continuous and automatic Bottle filling and cap sealing line comprising of:

(i) Auto placement of empty bottles on the conveyor feeding the filling line
(ii) Rinsing / cleaning of PET bottles with compressed air
(iii) Automatic filling of the product through multi head filler of the machine into bottles automatically getting placed underneath.
Iv) Automatic sealing of bottle mouth with printed Aluminium foil
(v) Automatic fixing of the twist-on cap onto the bottles
(vi) Automatic labeling of the bottle
(vii) Automatic bar coding and printing on the labels
(viii) Automatic discharge of the packed, sealed and labeled bottles from the discharge conveyor.

b) The operation of the machine shall be programmed, controlled, monitored and recorded on a PLC based computer system operated on a touch screen operator interface monitor that displays the sequential process line from intake of empty Bottles up to the discharge of the filled and sealed Bottles. The display shall mainly be for :

- Screen flow chart as mimic panel
- Product speed setting
- Production code memory
- Temperature control
- Various operational switches
- Alarm set for any faulting of process parameters such as air pressure, motor over load, abnormal temperature, heat disconnection, low level index and absence of date coder ribbon end, control voltage (as per vendor design)

Note : Notwithstanding the desired specifications of the CONTINUOUS AND AUTOMATIC BOTTLE FILLING MACHINE as mentioned, the buyer shall willingly consider alternate/proprietary specifications of the Vendor but only if it offers to improve the efficiency of operation, helps in reducing the consumption of Utilities and has any proven relatively superior techno-economic merits.:

5. Major Components

i) PLC with touch screen and inverter

ii) Conveyors and Motors

iii) Empty Bottle pallet intake and discharge conveyor with motor

iv) Circuit protection etc.

In short the Bottle filling & sealing machine will be complete in all respects, ready as switch on and operate system.

6. Material of Construction

All contact parts	SS-304
All Major components and outer view parts	SS-304
Outside and supports	PU coated and / or anodized aluminum alloy.

7. Utilities (Buyer's Scope)

The vendor is required to indicate the consumption norm of all the utilities along with their Techno-Commercial offer as the same can be made available well before the equipment is scheduled for the trial runs prior to its final commissioning. The requirement of Utilities may be indicated as under :

i) Electric Power.....KW, at 415 V+10%, 50 Hz, 3 Ph.

ii) Compressed Air :.....lpm or .....cfm at.....Bar or kg/sq. cm

iii) Saturated Steam .....Kg./hr at .....Bar or kg/sq. cm

iv) Water .....Kg./hr at..... Bar or kg/sq. cm

8. Scope of Supply

i) Design, Manufacturing, Delivery and Installation of the machine shall be on turnkey basis
ii) Imparting Training to the Operators at site on Start-up, Operation, Maintenance, Shut-down and quality control

9. Documentation

The vendor shall be obliged to submit all the following technical documents

i) Operation Manual
ii) List of Essential Spare Parts
iii) Maintenance Manual
iv) Shut down and restart manual along with necessary pre-cautions

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TECHNICAL SPECIFICATIONS FOR DRUM FILLING MACHINE

A. Equipment:

This Drum Filling Machine shall be a semi automatic machine having a loading conveyor, filling and Weighing station, unloading conveyor and a control panel. The machine shall be used for filling 300 kg processed honey in epoxy coated metal barrels.

B. Number Required

As part of this tender it has been proposed to procure and install one number of these barrel filling machines.

C. Brief Descriptions:-

Barrel Filling Machine should consist of a fill controller, electro mechanical weighing platform and a dual stage filling valve. The Fill Controller should have a micro-processor based electro pneumatic system with a fast sampling ADC. The Load cells should be mounted below the weighing platform to sense the volume and send signals to the fill controller. The dual stage filling valve should be a pneumatic valve operating in coarse and fine mode to achieve the required accuracy.

D. Detailed Specifications:-

1	Flow ability of the product	Viscous but Free Flowing
2	Nominal Filling Capacity	300 Kgs.
3	Product to be Filled	Honey Avg. Sp. Gravity : 1.4 Avg. Viscosity : 1500 cPs
4	Resolution	50 gms
5	Accuracy	± 2e (100 gms)
6	Nozzle Diameter (ID)	27 mm / vendor design
7	Number of Fillings Based on NFC	Minimum 10 Barrels per hour
8	Load Sensor Capacity	700 Kg Capacity of Load Cells
9	Control Panel	- Minimum 8 Digit, -12 mm, 2 row, 7 segment LED Display,

		-4X4 Matrix keypad, -Cumulative Batch Totalizer -Other control switches - Emergency Power Cut-Off Switch
10	Product Discharge Valve	-Pneumatically operated -two position valve made of SS 304
11	Contact Parts	SS 304
12	MOC for Non Contact Parts	Mild Steel Powder Coated
13	Air Supply & Pressure	As per vendor requirement
14	Platform	Minimum 700 mm x 700 mm SS Roller Top
15	Rollers	Minimum Nos - 7 nos, Minimum Dia - 60 mm Dia, MOC - Stainless Steel 304
16	Power Availability	230 V, 50 Hz. uninterrupted

E. Scope of Supply:

The scope of supply shall be considered on turnkey basis including design, fabrication, assembly, erection, installation and commissioning.

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TECHNICAL SPECIFICATIONS SHEET FOR PRESSURIZED HOT WATER GENERATOR

1. INTRODUCTION:

In a honey processing unit hot water around 100 deg. C is used as a medium of heat transfer in the honey evaporator. It is also used for circulation in the jacket of honey storage tanks. In the de-crystallization process hot water- air radiator system is used to heat the raw honey.

2. SCOPE OF SUPPLY:

A 6,00,000 Kcal/ hr heat transfer capacity pressurized hot water generator based on wood briquettes as fuel with all standard Balance of Plant (BoP) equipment on a turnkey basis. It has been further detailed out below:-

A) HEATER ASSEMBLY

Concentric coil assembly/ VENDOR DESIGN, forming a Three flue Pass heat exchanger made from heavy thickness boiler tubes, suitable for high temperature operation.

B) CIRCULAR FURNACE/ Vendor Design (Refer to GA Drawing)

The furnace shall be constructed from M.S. plate. Furnace shall be provided with necessary openings and nozzles for combustion air & secondary air. It should offer ample provision for combustion of volatiles within the combustion zone. Adequate number fire doors & ash doors shall be provided for ash removal. The brick wall design shall be engineered for very minimal heat loss & long life of bricks.

B1)

The fire-grate bars shall be made of special triple bar design for efficient combustion of fuel & minimum fuel wastage.

B2)
By pass damper (for cooling furnace in event of power failure)

D) ONE CONTROL PANEL

Control Panel shall be pre-wired and perform an extensive functional test. Control panel shall consists of MCB for all motors, contactors, timer, indicating lamps, hooter, control switches, temp. Indicators and controllers shall be pre-wired by means of cable duct wiring.

E) ONE HOT WATER CIRCULATING PUMP

High temperature Hot water circulating pump with Mechanical seal, suitable for high temp operation, directly coupled with an electric motor mounted on a common base frame with back pull out coupling.

E) EXPANSION TANK:

Expansion Tank shall be provided with gauge glass assembly, level switch etc.

G) MULTI CYCLONE DUST COLLECTOR:

Multi cyclone Dust Collector shall be made out of Chilled Cast Iron Cone to Reduce the Fly Ash Emission.

H) ID FAN

Assembly complete with motor, pulleys, driving belt. Damper, safety guard chaired on base frame.

I) FD FAN

Assembly complete with motor.

J) Interconnecting flue gas ducting up to MDC

K) Insulation and decorative cladding for heat exchanger

L) Refractory for furnace consisting of Insulation bricks, fire bricks

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3. Instrument Control & Safety Features

i. One pressure indicator for circulating pump pressure.

ii. One pressure indicator for circuit pressure measurement.

iii. One Gauge glass assembly on expansion tank.

iv. Flap type explosion damper at the heater flue gas outlet

v. One Digital temperature indicator cum controller for Hot water forward temperature.

vi. One Digital temperature indicator cum controller for Hot water return temperature.

vii. One Audiovisual alarm for abnormal operating conditions.

viii. One Differential pressure switch for protection against low/ no flow

ix. Conditions connected across inlet and outlet HWG.

x. One Stack temperature indicate cum controller

4. The quotation should explicitly mention the cost of supply & installation of the Balance of Plant (BoP) equipment , which includes but not limited to

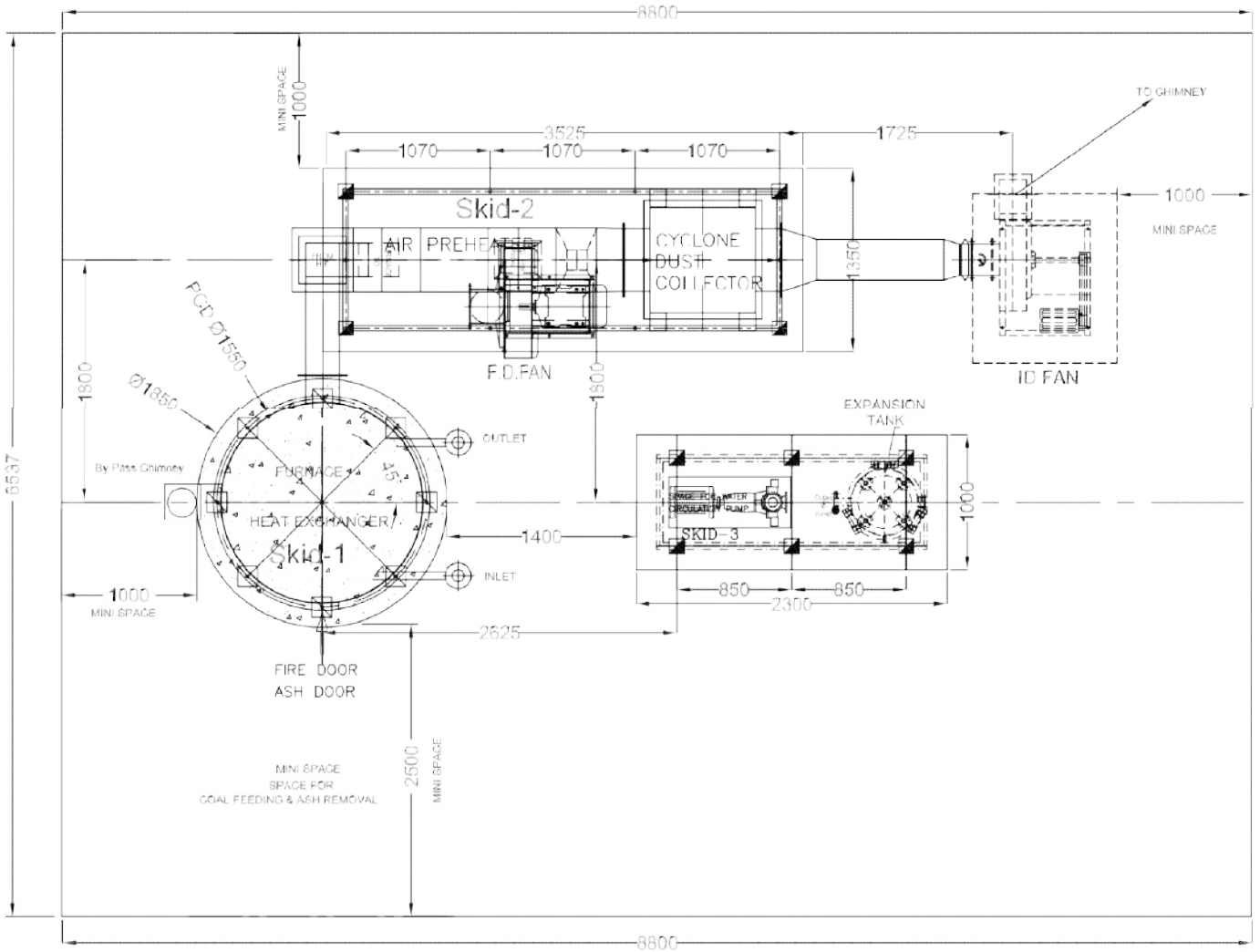
i. Chimney

ii. Flue gas ducting

iii. Refractory

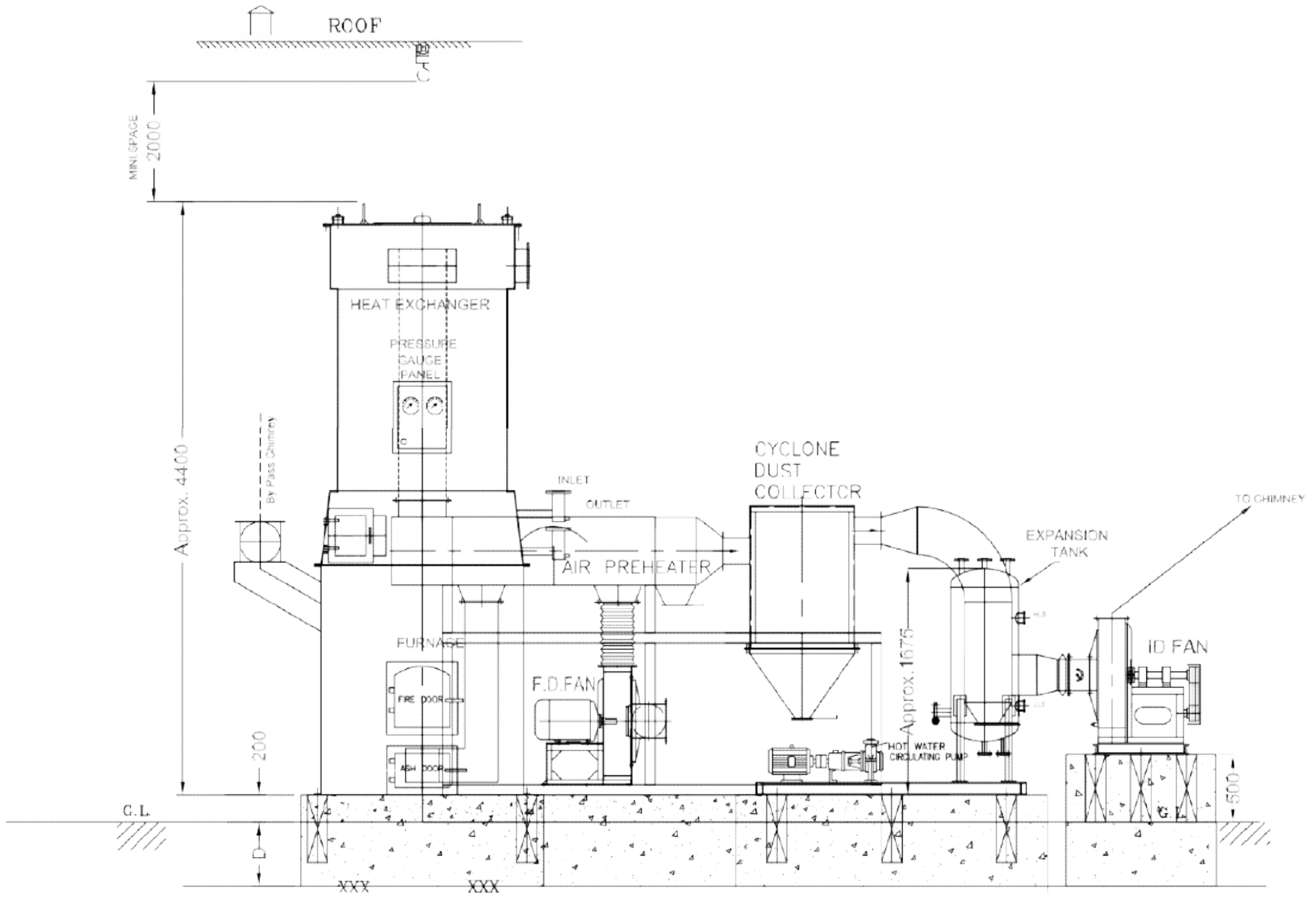
iv. Interconnecting piping works

v. Cabling for PHWG & accessories



Typical Plan View
of
Pressurized Hot Water Generator

Title : Typical Plan View of P.H.W.G.			
Project : Setting up of Honey Collection & Processing Infrastructure Facilities Under N.E.B.M. by N.A.F.E.D.			
Mariental	Mariental India Pvt. Ltd.		
DRAWN BY:			CLIENT:
CHECKED BY:			
APPROVED BY:			SCALE: NTS REV.
DRG. NO.:			



Typical Elevation View
of
Pressurized Hot Water Generator

Title	: Typical Elevation View of P.H.W.G.
Project	: Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.
Mariental	Mariental India Pvt. Ltd
DRAWN BY	
CHECKED BY	
APPROVED BY	
SCALE:	NTS
DRG. NO.	
REV.	

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TECHNICAL SPECIFICATIONS SHEET FOR EFFLUENT TREATMENT PLANT

1. INTRODUCTION:

In a honey processing unit the process effluent is generated in the evaporator which is a direct result of the moisture reduction of the raw honey. Besides this a considerable amount of effluent is also generated in frequent floor washing of de-crystallizer area and due to the cleaning of used honey buckets.

2. QUANTITY & QUALITY OF EFFLUENT :-

Nature of waste water	:	Process and Wash Water from Honey Processing Plant
Total effluent generated	:	20 m3 per day
PH	:	5 - 7
BOD	:	6000 - 8000 mg/l
COD	:	12000 - 15000 mg/l
Suspended Solids	:	720-1000 mg/l
Dissolved Solids	:	3400 - 3200 mg/l
Kjeldahl Nitrogen	:	8 - 10 mg / l
Oil & Grease	:	20-25 mg/l

3. REQUIREMENT OF TREATED EFFLUENT DISCHARGE (Basis of Design)

pH	:	7.0 +/-0.25
BOD	:	30 mg/ l

Suspended Solids	:	100 mg/ l
COD	:	220 mg /lt.
Oil & Grease	:	Below 10.0 mg./ lt.

Treated waste water shall conform to the norms of water good for irrigation purpose and hence suitable forgrowing of vegetable, herbs and grains.

4. BRIEF DESCRIPTION OF WASTE WATER TREATMENT SCHEME:-

i. Screening (BAR SCREEN)

The bar screen with openings of uniform size to remove suspended or floating matters in effluent to be provided. The velocity of effluent should be maintained so as to avoid settling of grit or organic matter. The screens should be cleanable manually.

The materials of construction for screens shall be SS-316. The screens should have atleast 12 mm clear spacing between two bars each of 10 mm thickness. Designed velocity through screen shall be between controlled at 0.5 M/sec to 0.7 m/sec. The angle of inclination of the manual bar screen with the horizontal shall be preferably 45 to 60. The parts other than stainless steel shall be given two coats of epoxy paint or rubber coating.

ii. Oil &Grease Trap

The raw effluent after passing through Bar Screen should be taken into an oil & grease trap for removal of any oil and Fat / Grease. Removal of Oil and Fat/ Grease shall be manually.

iii. Raw Effluent collection cum Equalization Sump (Collecting Tank)

The raw effluent from oil & grease trap should be collected in a raw Equalization tank. Here Air Mixing nozzle grid should be provided to equalize the Effluent & to remove the foul gases from the liquid. It also homogenizes the Effluent & avoids the suspended solids to settle. The raw Effluent shall be pumped using pumps of suitable capacity to the Flash Mixer.

iv. Anaerobic Sludge Blanket Reactor (ASBR)

The effluent should remain in this tank for Anaerobic Reaction, the biological treatment should take place here in absence of oxygen because there would be some bacteria who does not require oxygen. After this the effluent should go in to primary tube settler tank for removal of sludge.

v. Primary Tube Settler Tank

The tank should be provided with proper inlet distribution to achieve steady velocity throughout the cross section of the tank and to avoid turbulence. Supporting structure for tube settler should be provided. The media should be of such material of construction as to be non-degradable and UV resistant. The quantity of media should be adequate to provided sufficient surface area for proper separation of solid & liquid & to achieve the required quality of treated water.

The sludge hopper should be designed to collect the sludge and allow moving towards drain pit. The solids separated should be drained with established frequency for further disposal.

vi. SECONDARY TREATMENT (BIOLOGICAL TREATMENT)

Aerobic attached growth Bio Reactor (MBBR Reactor)/ Activated Sludge Process (ASP)

The bioreactor should be designed so as to treat the sewage through the attached growth moving bio-media. The reactor be suitably sized & designed to take the organic and suspended Solids load in the primary treated effluent and deliver consistently at the outlet as per the treated wastewater quality mentioned.

The media should be of preferably virgin HDPE (white) with 0.95 ± 0.02 specific gravity non degradable and UV Stabilized. The media quantity should be adequate to provide sufficient surface area for maintaining the microbial strength as required achieving the quality.

The designed BOD loading on media shall not be taken more than 1.20 kg of BOD/100 sq. m of media surface area of media/ Day for designing purpose and the volume of media shall not be less than 30% volume of the reactor in the tank.

The surface area of media to be used for designing purpose shall not be more than 200 sq. m/ cum where as in actual itshall not be less than 600 sq. m /cum.

The air quantity required should be suitable to provide sufficient oxygen (DO Level) for aerobic biodegradation of the influent organic matter. The air should be supplied by positive displacement roots type Air Blower.

The material of construction should be suitable to avoid any corrosion and also shall be designed to avoid any-choking.

vii. Mixing chamber

Flash Mixers provided after Equalization tank for chemical treatment. In this tank lime/ alum should be added to neutralize and coagulate the suspended effluent. The effluent from flash mixer should be transferred to the flocculation tank.

viii. Flocculation Tank

The effluent from flash mixer should be transferred to the flocculation tank. In this tank polyelectrolyte should be added forflocculation.

ix. Secondary Tube Settler Tank

The tank should be provided with proper inlet distribution to achieve steady velocity throughout the cross section of the tank and to avoid turbulence. Supporting structure for tube settler should be provided. The media shall be of such material of construction as to be non-degradable and UV resistant. The media quantity shall be adequate to provided sufficient surface area for proper separation of solid & liquid & to achieve the required quality of treated water.

The sludge hopper should be designed to collect the sludge and allow moving towards drain pit. The solids separated should be drained with established frequency for further disposal.

x. Sludge Sump

The sludge from the Secondary Tube Settler tank shall be taken into a Sludge Sump. From the Sludge Sump, the sludge should be taken to a Sludge Drying Beds.

xi. Disinfection unit (Chlorine Contact Tank)

The Chlorine Solution dosing system for the clear treated sewage with the help of Dosing pumps should be provided. Necessary flow pattern should be created in the tank for proper mixing and allowing completion of reaction by providing baffles.

The quantity dosage for disinfecting agent should be sufficient to achieve the microbial count as per the prevailing norms for treated sewage as given by State Pollution Control Board. The dosing system shall be suitable to deliver on 24 hours continuous basis.

xii. Solids Handling (Sludge Drying Beds)

The Sludge from the Secondary Clarifier as is applicable should be removed by gravity on to Sludge Drying Beds. The filtrate from the Sludge drying Beds should be collected in a filtrate chamber and recycled back to the system.

xiii. MGF TERTIARY TREATEMENT (POLISHING OF SECONDARY TREATED WATER)

After disinfection the secondary treated effluent shall pass through the series of filters consisting of Pressure Sand with the help of filter feed pumps for removal of any colloidal particles and any other contaminants.

xiv. ACF TERTIARY TREATEMENT (POLISHING OF SECONDARY TREATED WATER)

After disinfection the secondary treated effluent is to pass through the series of filters consisting of Activated Carbon filter with the help of filter feed pumps. It should help in removal of any colour or odour and any other slippages.

5. RECOMMENDED MAKES

i.	Pump	:Crompton/ Kirloskar/ Modi
ii.	Electric Motor	: Havell/ Kirloskar/ Crompton/ NGEF/ ABB
iii.	Air Compressor	: Anest
iv.	Dosing Pump	: Minimax/Airvac/Positive
v.	Flexible Coupling	: Fenner/Love-joy
vi.	Pipes	
	M.S. (C-Class)	: Jindal/Ravindra
	P.V.C. (6kg/cm2)	: Prakash/Wavin
vii.	Valves	: Audco (L&T)/Sant/Leader
viii.	Fittings	: PVC/ MS/ CI
ix.	Electric Cables	: PVC Aluminium/ Armoured/ Premium
x.	Electric meters Switches, Relays Energy meter, Contactor	: L&T/ GEC/ Havells
xi.	Electric earthing	: GI 8 SWG
xii.	Indicator	: Veeco/ Concord/ Fine

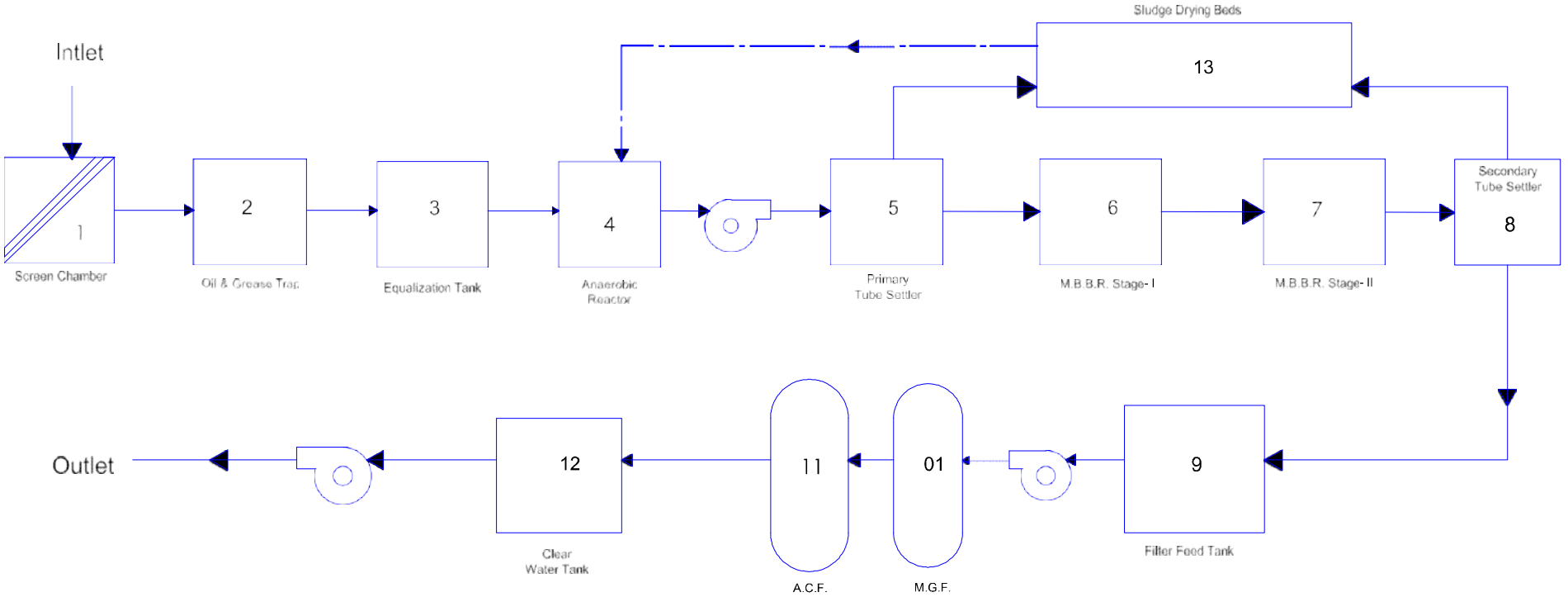
6. INFORMATION TO BE SUBMITTED WITH THE PROPOSAL (MANDATORY)

i. Land Area Required ----------sq. m

ii. Power
Installed_____KW
Operational_____KW

iii. Chemicals Required
Urea_____Kg per day
DAP_____Kg per day
Alum_____Kg per day

iv. Time Required for
Complete Supply ---------- Months
Erection &_____Months
Commissioning
Stabilization of the Plant---------- Months



Recommended Flow Scheme of Proposed Effluent Treatment Plant

Title : Recommended Flow Scheme of Proposed E.T.P.			
Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.			
Mariental India Pvt. Ltd.			
DRAWN BY	R. Singh	24/06/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (NAFED), New Delhi
CHECKED BY	V. Kumar	05/07/2021	
APPROVED BY	V. Kaul	05/07/2021	SCALE: NTS / REV.
DRG. NO: E - 2106-10 - TENDER E10- 0			0

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TECHNICAL SPECIFICATIONS FOR WATER CHILLING PLANT

A. System:

This system is required to generate chilled water for supplying to condenser and vacuum pump of the Scrapped Surface Evaporator and other product cooling systems.

B. Capacity

The system should be able to constantly supply water at a temperature of 10 °C in a closed circuit at the return temperature of 15 °C and a Delta T of 5-6 °C

C. Brief Description

The system should consist of three major components:-

a. Skid mounted water chiller

It should be a VC based refrigeration system with following detailed specifications;-

i.	System	: Industrial Shell & Tube Process Chiller
ii.	Flow Rate	: 15 m3 per hour (peak requirement)
iii.	Feed Water temperature	: 15 °C
iv.	Outlet temperature from chiller	: 10 °C
v.	Refrigeration Load	: 30 TR approx or Vendor Design
vi.	Configuration	: 2 x 15 TR Units or Vendor Design
vii.	Chiller Type	: Shell & Tube type
viii.	Condenser Type	: Shell & Tube(Water Cooled)
ix.	Refrigerant	: R-22
x.	Compressor Type	: Scroll
xi.	Control	: Fully Automatic
xii.	Power Supply Availability	: 440 V/ 3-P / 50 Hz
xiii.	Connected Load	: Vendor Design
xiv.	Protection	: IP 54
xv.	Noise Level	: Less than 80 db at 1.0 m distance

Recommended make of Items:

i.	Compressor	: Danfoss / Emerson / Tecumseh
ii.	Condensor	: Vendor make
iii.	Chiller	: Vendor make
iv.	Base frame	: Vendor make
v.	Expansion Valve	: Danfoss or Equivalent
vi.	LP / HP Switch	: Danfoss or Equivalent
vii.	PID	: Honeywell or Equivalent
viii.	Control Panel	: Vendor make
ix.	Electricals	: Schneider / Siemens
x.	Gauges	: Wika (Germany) or Equivalent
xi.	Valve	: Danfoss or Equivalent
xii.	Isolation Valves	: Danfoss or Equivalent
xiii.	Filter / Dryer	: Danfoss or Equivalent
xiv.	Voltage Scanner	: Proton / Minilec
xv.	Pump	: Kirlosker ,Crompton or Equivalent
xvi.	Chilled Water Tank	: Vendor make

b. Cooling tower with circulation pumps

A FRP cooling tower of double the capacity for the water cooled condenser of the chiller complete with all inter-connecting piping & 2 no.'s (1W + 1S) circulation pumps of suitable capacity. Pumps should be either Kirloskar or Crompton make

c. Chilled water tank and circulation pump

A Chilled water tank with a capacity 1,000 litre made of SS 304 with insulation and thin gauge cladding. Chilled water supply / return pipe line should also be insulated and clad with thin gauge aluminium sheet.

Following are the specification for 2 no.'s (1W + 1S) pumps in the chilled water S/R line:-

a.	Suitable for	: Chilled Water (range 20 °C to 5 °C)
b.	Type	: Centrifugal
c.	Flow Rate	: 15 CMH
d.	Head	: 10 meter
e.	No. of	: 2 no.'s (1W + 1S)
f.	Pressure Gauge	: 150mm
g.	Check Valve	: Suitable size
h.	Strainer	: Y strainer

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TECHNICAL SPECIFICATIONS SHEET FOR AIR COMPRESSOR

1. INTRODUCTION:

Air cooled, oil injected, single stage, screw type compressor having a free air delivery of 76.9 cfm at a discharge pressure of 10 bar. This compressor should be coupled to 15 kW (20 hp)/ *Vendor Design* TEFC Squirrel Cage motor having Class 'F' insulation and IP55 protection suitable for a supply. The whole unit should be mounted on vibration free insulation and packed in a sound absorption canopy, to limit sound level to 74 db at a distance of 1 meter**.** The compressor should be fitted with a control panel, which also houses a star-delta starter. The machine should be designed to operate at ambient temperature of 46^0C, without any alteration of performance parameters specified.

2. NUMBER REQUIRED

One (1) number of air compressor complete with all accessories as detailed out below is required to be installed.

3. SCOPE OF SUPPLY

A single stage rotary screw compressor element equipped with

• Heavy Duty Dry type Intake Air Filter, conveniently located for quick and easy replacement with cyclonic separation and arrangement for pre filter separation.
• Unloading Assembly with piston type Un-loader for Full Load/No Load regulation.
• Air/oil temperature Transmitter.
• Non-return valve at Element Discharge.
• Automatic Oil Stop valve.
• Locally mounted vacuum gauge for suction Air Filter

i. Air & oil separator tank should consists of

• Sight Glass for Oil Level Indication and Oil filling arrangement.
• Oil Separator Element should provide clean quality air by separating oil and to reduce oil consumption. Final Oil carryover should ideally be 2/3 ppm.
• Minimum Pressure Valve.
• Safety Valve.

• Pressure Gauge before Oil Separator.
• Oil Draining arrangement.

ii. After cooler & oil cooler equipped with

• Externally Air-cooled (Fan cooled) High efficiency Block type Aluminium After Cooler and Oil Cooler.
• Radial Fan for cooling.
• Full Flow Oil Filter with Thermostatic Bypass Valve to avoid condensation during extended no-load run.
• Oil Restrictor to regulate Oil Flow.

iii. Moisture trap equipped with

• Automatic and Manual Drain Trap
• Final discharge Air Pressure Transducer.

iv. Capacity regulating system with

• Air/Oil Receiver blow down mechanism to reduce No Load power consumption
• Pressure Transducer to set discharge Air Pressure to desired limits/Pressure bands.
• Load/No load system with automatic start/stop through Solenoid Valves and Timer.
• Control tubing.

v. Drive arrangement

• Suitable Gear Drive.

vi. Electric motor

15 to 30 KW/ *(Vendor Design)* TEFC (Totally Enclosed Fan Cooled) Sq. Cage high efficiency Motor suitable for 400 Volt plus minus 10%, 3 ph, 50 Hz plus Minus 5% AC supply. Motor should be with IP55 protection, class F insulation and B5 Construction having single point support at the bottom.

IP 55 means:
5 = Dust can still penetrate but not in such quantity that it disturbs
5 = Protected against Water jets on the Motor from any directions

vii. Control Panel

Suitable Star Delta Starter with Contactors and Relays.

4. SAFETY FEATURES

- Discharge Safety Valve
- Motor Overload Trip.
- High Air/Oil Discharge Temperature Trip at the outlet of the Screw Element.
- Oil Level Indicator mounted on the Air/Oil tank.
- In-built protection against starting on Load.
- Control Transformers 415V/240/24 Volts for safety purposes
- Locally mounted Vacuum Indicator to show the chocking level of the air inlet filter.
- Locally mounted pressure gauge upstream of the oil separator.
- Final pressure gauge mounted at the down-stream of moisture trap.

5. NOTE

i. All above Equipment/Accessories should be mounted on a common base frame for foundation-less installation.
ii. Compressor should be housed in a powder coated and laser cut sound absorbing Canopy to limit noise level to 75/76 dB (A) plus minus 3 dB(A) at a distance of 1 meter as per ISO3744/PN8NTC2 Test Code measured under Free field condition.
iii. Compressor should be suitable for continuous heavy duty operation.
iv. The laser cut base frame should be made sturdy equipped with facility for fork lifting arrangement.
v. Anti Vibration Mountings (AVM) should be provided on the compressor frame for vibration isolation from the Screw Element, Motor and Oil Separator Tank.
vi. Pre wired connection between the motor and starter should be provided.
vii. Control cabling including connection with the Fan should be provided.

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TENDER SPECIFICATIONS

For

i. **MECHANICAL ERECTION**
ii. **PROCESS & UTILITY PIPING**
iii. **WATER PUMPING, TREATMENT & DISTRIBUTION SYSTEM**
iv. **FIRE FIGHTING SYSTEM**

ON TURNKEY BASIS
IN
ESTABLISHING A HONEY PROCESSING UNIT

****** QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

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DEFINITION

a. **'Owner/Client'** shall mean National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) and include all authorized officers/representatives.

b. **'Engineer / Technical Consultant'** shall mean Mariental India Pvt. Ltd. and include all authorized officers / representatives.

c. **'Bidder'** shall mean the firm/party who quote against this enquiry.

d. **'Vendor / Contractor / Fabricator'** shall mean the successful bidder against this enquiry and other turnkey suppliers.

e. **'Site'** shall mean the actual place for the said project

f. **'Bid'** shall mean the proposal / document that the bidder submits in the requested and specified form.

h. **'Erection'** shall mean

   a. Shifting of machines or their components from the present position within the covered premises of the plant to the place of installation as per layout drawing.

   b. Assembling the components and installation of the machinery with proper foundations as per design and drawings.

   c. Fabrication of support structures, cat walks etc. and their hook up with utility connections.

   d. Incorporating changes, additions and attractions etc. as advised by the experts supervising the installation at the pre-determined places with proper supports and ready for connections and commissioning.

i. **'Commissioning'** shall mean integrated activity covered under 'Preliminary Operation' and carrying out performance tests.

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Mechanical Erection

TECHNICAL SPECIFICATIONS SHEET
FOR
MECHANICAL ERECTION

1. INTRODUCTION

The major equipment which require installation/ erection in establishing a honey processing unit are evaporator, various pumps, storage tanks, boiler etc. The objective of this document is to detail out the nature and scope of work under this category.

2. SCOPE OF WORK

The work of mechanical erection contractor shall start right from the arrival of shipment at site from various equipment suppliers. The contractors work involves handling, internal transportation, pre-fabrication, pre-assembly, assembly, welding, erection, inspection, vendor support in commissioning, load testing and handing over of the equipment. The contractor shall arrange for all tools & tackles including for the material handling equipment.

3. LIST OF EQUIPMENT

Following is the indicative list of equipment:-

i. 1 no. Evaporator complete with all components
ii. 4 no.'s 20 KL SS304 Honey storage tanks
iii. 4 no.'s Agitator for 20 KL tanks
iv. 1 no. Honey de-crystallizer
v. 5 no.'s of Process pumps
vi. 1 no. Gravity filter
vii. 5 no.'s Duplex filter
viii. 1 no. Honey condenser
ix. 1 no. Drum filling machine
x. 1 no. Water chilling plant with cooling tower
xi. 1 no. Pressurized hot water generation system with components viz. FD fan, ID fan, chimney etc.
xii. 1 no. Air compressor with standard accessories
xiii. 1 no. DG set
xiv. 1 no. VCB

****** QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

xv. 1 no. Transformer
xvi. 1 no. complete refrigeration plant for cold storage

The above list is not exhaustive. The contractor shall be working on a turnkey basis and hence his scope is understood to include handling of all equipment big or small as may be received at site as the work progresses.

4. OBLIGATIONS

The owner shall:

i. Submit all relevant drawings necessary for carrying out the activity
ii. Issue of materials at delivery point
iii. Single point electrical power supply, contractor shall be responsible for installation and cabling
iv. Contractor shall set up his work shed/ office within factory premises

5. COMMISSIONING & TESTING OF EQUIPMENT

i. After completion of erection as per drawing and manuals contractor shall carry out visual checks as part of pre-commissioning checks to ensure that all parts of mechanical, structural, electrical fitting, lights, limit switches including earthing, buffers, bell/ hooter, fasteners, welding, touch up painting, safety devices or if any are in place signifying readiness of the equipment for testing.

ii. The temporary arrangements made for erection of equipment should be removed after completion of work

iii. All the commissioning works should be properly documented together with the equipment supplier involved as commissioning reports and should be submitted to technical consultants/ client for approval.

6. COMPLETION OF WORK & SUBMISSION OF C.C.C.

i. **Completion of Work-** As far as technical requirements are concerned, the contractor's work would be considered as completed when all the equipment are installed and have passed all examination, inspection and tests requirements and painted and complete in all respects in accordance with drawings and specifications. The contractor would be responsible for rectifying the defects and deficiencies revealed during testing or

commissioning of the equipment, on the joints, in consultation with the OEM's Engineer so as not to delay other works or testing.

ii. **Construction Completion Certificate (C.C.C.)-** The contractor shall submit CCC attaching all relevant documents needed for attesting the completion of work for each equipment. The CCC in the approved format shall be submitted to the technical consultants and shall be subject to endorsement by the same. The CCC for each equipment shall contain the following.

a. Equipment descriptions
b. Manufacturers instruction / literature
c. As-built drawing information
d. Important correspondence
e. Weld inspection reports & radiographic test final results
f. Weld procedures
g. Erection procedures for mechanical components (including forming and assembly procedures)
h. Equipment erection & alignment report
i. Commissioning and testing procedures
j. Commissioning and testing reports

Final completion certificate shall be issued only after the technical consultants has accepted all CCC's and after other provisions of general contract conditions are duly met. Along with the hard copy of final CCC the contractor shall submit scanned copy in soft form (pdf format).

7. CONFIDENTIAL INFORMATION

The drawings, specifications, proto-type, samples and such other information furnished to the contractor relating to the supply/works/equipments etc. are to be treated as confidential, which shall be held by the contractor in confidence and shall not be divulged to any third party without the prior written consent of the client. The contractor, therefore, binds himself, his successors, heirs, executors, administrators, employees and the permitted assignees or such other persons or agents directly or indirectly concerned with the works/supply to the confidential nature of the drawings, specifications, proto-type samples etc. It is a further condition of the contract that the Contractor shall not, without prior written permission from the client, transmit, transfer, exchange, gift or communicate any such confidential information and also the component, sub-assembly, products, by-products, nonconforming/ rejected equipment/components, etc. to any third party.

8. PATENTS & PATENT RIGHT INDEMNIFICATION

All specifications, drawings, patents and such other relevant information furnished to the contractor by the Client shall be the property of the client. If, during the process of execution of the contract, any improvement, refinement or technical changes and modifications are affected by the Contractor, such changes shall not affect the title to the property of the Client and the information, specifications, drawings, etc. including the improvement /modifications effected by the Client. The Client shall also have the absolute right to assign, transfer, sublet, use and transmit all such information and details to the Engineer's consultants. Contractor shall not have any claim or rights whatsoever in respect of the Clients drawings, specification, patents, proto-types etc. even where improvement/ refinement, modifications etc. were affected by the contractor.

All drawings, specifications, patterns, models and prototypes furnished to the contractor by the Client are intended to be complementary and to provide for and comprise everything necessary for the completion of work/supply and are the property of the Client. These are not to be used for any works or purpose other than those for which these have been provided and shall be returned to the Client immediately on completion of work/supply in good condition.

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Process & Utility Piping

TECHNICAL SPECIFICATIONS SHEET FOR PROCESS & UTILITY PIPING

1. INTRODUCTION

The process piping system in a honey processing unit starts when the raw honey is melted. Piping system enables honey to move through various filters, evaporator, pumps and then finally it gets stored in SS304 tanks before packing. All the process piping is done in SS304 pipelines as per the food industry norm. The utilities applicable, consists of hot water, compressed air, cooling water etc. For the utilities piping, seamless MS pipes with insulation as and where applicable should be used.

2. SCOPE OF WORK

This contract shall be on a turnkey basis for supply, erection, testing & commissioning of process and utilities piping as per the specifications, details and terms & conditions mentioned below. All the drawings and documents required for the successfully carrying out the piping works shall be made available to the contractor at relevant stages.

3. SCHEDULE OF QUANTITIES

i **PROCESS PIPING** *(All materials MoC shall be SS304)*

S. No.	Description	Quantity	Unit
1	**Stainless Steel 304 Pipes ASTM 312M; ASME B36.19M; Schedule 40**		
i.	80 NB - Seamless	126	meter
2	**Elbow 90 Degree (as per ASME B16.9)**		
i.	80 NB	20	no.'s
3	**Flanges- SORF #150 (as per ASME B16.5)**		
i.	80 NB	80	no.'s
4	**Reducers (as per ASME B16.9)**		
i.	65 x 80 NB	10	no.'s
ii.	50 x 80 NB	4	no.'s
5	**Equal Tee (as per ASME B16.9)**		
i.	80 x 80 NB	10	no.'s

****** QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

6	**Gasket- Neoprene Rubber, 3 mm thick**		
i.	80 NB	40	no.'s
7	**Ball Valve- (as per ASME B16.34)**		
i.	80 NB- Food grade polypropylene	40	no.'s
8	**Hex Nuts, Bolts & Washer- MoC SS304**		
i.	M16 x 90 lg	160	no.'s

i **UTILITIES PIPING** *(MS pipes & fittings)*

S. No.	Description	Quantity	Unit
1	**MS ERW Pipes** **IS 1239; ASME B36.10M; Schedule 40**		
i.	80 NB	156	meter
ii.	50 NB	144	meter
iii.	25 NB	6	meter
	Make: Jindal/ SAIL/ Tata/ Usha		
2	**Elbow 90 Degree (as per ASME B16.9)**		
i.	80 NB	6	no.'s
ii.	50 NB	30	no.'s
iii.	25 NB	2	no.'s
3	**Flange- SORF #150 (as per ASME B16.5)**		
i.	80 NB	24	no.'s
ii.	50 NB	40	no.'s
iii.	25 NB	2	no.'s
4	**Reducers (as per ASME B16.9)**		
i.	80 x 65 NB	2	no.'s
ii.	80 x 50 NB	10	no.'s
	50 x 40 NB	2	no.'s
5	**Equal Tee (as per ASME B16.9)**		
i.	80 x 80 NB	6	no.'s
ii.	50 x 50 NB	4	no.'s
6	**Ball Valve- (as per ASME B16.34)**		
i.	25 NB	1	no.'s
7	**Y- Strainer**		
i.	80 NB	2	no.'s
ii.	50 NB	2	no.'s
8	**Non Return Valve**		
i.	80 NB	2	no.'s
ii.	50 NB	2	no.'s
9	**Gate Valve**		
i.	80 NB	8	no.'s

****** QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

ii.	50 NB Make: L&T/ VIP/ AMCO	16	no.'s
10	**Gasket- EPDM, 3 mm thick**		
i.	80 NB	12	no.'s
ii.	50 NB	20	
iii.	25 NB	2	
11	**Blind Flange**		
i.	80 NB	2	
ii.	50 NB	2	
12	**Studs, Bolts & Washer**		
i.	M16 x 90 lg	48	no.'s
ii.	M16 x 75 lg	80	
iii.	M14 x 55 lg		
12	**Hot Water Circulation Pump** Duty = Water upto 150 Deg. C Flow = 40 cu. M / hr Head = 30 meter Type = Centrifugal Make: Kirloskar/ Crompton/ Havells	2	no.'s
13	**Chilled Water Circulation Pump** Duty = Water from 4 deg. C to 25 deg. C Flow = 20 cu. M / hr Head = 20 meter Type = Centrifugal Make: Kirloskar/ Crompton/ Havells	2	no.'s
14	**Insulation Works with 2 mm Aluminium cladding**		
i.	80 NB pipe, 2 inch rock-wool	156	meter
ii.	50 NB pipe, 1 inch thermocol	144	meter

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4. GENERAL & SPECIAL CONDITIONS OF CONTRACT

i. General

a. All piping system should be fabricated installed flushed and tested in strict accordance with the specifications given in this tender and applicable drawings. Any deviation from the drawings and specifications should be made only after the written approval from the site engineer/consulting engineer has been obtained. The finished work should be cleaned, tested, checked and prepared for start-up.

b. All structural steel work should be carried out in accordance with IS:800 (welding and material).

ii. Pre-fabrication of Piping

a. The contractor should fabricate all pipe work in conformity with the requirements pertinent to general arrangement and specifications. Where specific details of fabrication are not indicated on the drawings, fabrication and erection should be done in accordance with relevant India/International codes of practice. Testing or otherwise, the lightness of the joint should be ensured by suing proper thread sealant suitable to the service temperature. Oil, grease and other sealing and protecting materials/consumables should be supplied by the contractor at his cost.

b. The contractor should be responsible for working to the exact dimensions as shown on the drawing irrespective of individual tolerances permissible. Where errors and/or omissions occur on the drawings it should be contractor's responsibility to notify the Engineer-In-Charge/Consulting Engineer prior to fabrication or erection.

iii. Alignment & Spacing

a. The pipes to be joined by welding should be aligned and spaced suitably with the accepted tolerances diameters, wall thickness and out of roundness.

b. All flange facing should be true and perpendicular to the axis of the pipe to which they are welded. Flange bolt holes should straddle the normal centre lines unless different orientation is shown in drawing to match the equipment connections, etc.

c. The pipe end to be butt welded should be secured with the aid of coupler, yokes or 'C' clamps to maintain perfect alignment. Yokes should be welded with

electrodes suitable for welding the parent metal and should be detached after the completion of welding without.

d. Tack welds for the alignment of pipe joints shall be done by only qualified welders. Since tack welds form part of final welding, they shall be executed carefully and shall be free from defects. Defective tack welds shall be removed prior to the final welding of joints.

Tack weld should be equally spaced as follows:

- For 65 NB & Smaller : 2 tacks
- For 80 NB 350 NB pipe : 4 tacks

iv. Threading

a. The threads shall conform to IS:554 in case of pipes for matching with those of pipe fittings.

b. The threads shall be full length and concentric with reference to outside of the pipe and free from defects.

c. On all threaded connections like vent, drains, couplings, etc. the threads shall be protected from rusting by applying grease/oil when lying in open condition. While fixing the plugs/ caps for pressure.

v. Pipe Joints

a. In general, butt welding jointing for lines 50 NB and above in process and utility piping system should be followed. Pipe lines 40 NB and below shall have secured joints or as specified in the piping material specifications. In general, flanged connections shall be used at connections to vessels and equipment and wherever required for ease of erection and maintenance purpose.

vi. Cleaning of Pipes

a. On completion of shop/field fabrication, all pipes and fittings shall be cleared inside and outside by suitable means before erection to ensure that assembly is free from all loose foreign materials such as scale, sand, weld spatter particles such as scale, sand, weld spatter particles cutting slips, etc.

b. Both shop and field fabricated piping should be blown out with compressed air after completion of cleaning operations and capped.

vii. Welding

a. Welding should be carried out only by fully trained and experienced welder, as tested and approved by the Engineer-In-Charge or this representative. The cost involved in carrying out test shall be borne by the Contractor.

b. The welders should always have in their possession an identification card and should produce it whenever demanded by the Engineering-In-Charge or his representative. It should be the responsibility of the contractor to issue the identity cards after it is duly certified by the Engineer-In-Charge or his representative.

c. No welder should be permitted to work without the possession of identity cared.

d. If a welder is found to perform a type of welding of in a position for which he is not qualified, he shall be debarred from doing any further work. All such welds so performed shall be cut and redone at the expense of the contractor.

e. Inspection of all welds shall be carried out as per API-1104, latest addition. All finished welds shall be usually inspected for parallel and axial misalignment of the work excessive reinforcement for concavity of welds, shrinkage, cracks, inadequate penetration, un-repaired burn through under-cut, dimensions of the welds, surface porosity and other surface defects. Under cutting adjacent to the completed weld shall not exceed 0.8 mm in depth or 50mm in any continuous 300mm of weld.

f. Defects ascertained through the inspection methods and which are not under permissible limits shall be removed from the joint completed by process of chipping or grinding.

g. When the entire joints is unacceptable, the welds shall cut completely and the pipe ends shall be resorted for re-welding. After re-weld the joints shall be again checked.

h. No welding shall be performed during rain and strong winds unless suitable protection is provided by the contractor for the parts to be welded and the welding personnel. Where this is not practicable, no welding shall be done.

viii. Tolerances

a. Maximum deviation from a straight line shall not exceed 3mm in 10 meter length.

b. Maximum deviation for spacing of two holes on the same axis shall be +/- 1mm.

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c. Two perpendicular diameter of any oval hold shall not differ by more than 1mm.

d. Length and other liner measurements shall not differ by +/- 3mm.

e. Maximum deviation for flange alignment measured in any direction, shall not exceed 0 deg. 30.

f. Maximum permissible parallel / misalignment for alignment of line joints shall be +/- 1.5mm.

ix. Erection

a. Prefabrication of piping shall be carried out at the site fabrication shop or available space in process shed to accelerate progress of pipe work and to minimize work in the field. Such prefabrication should be based on approved isometrics and piping layouts furnished to the contractor. Field welds shall be decided by the contractor. The shop fabricated pieces shall be as large as practicable to facilitate easy and trouble free transportation to site.

   All piping systems shall be properly supported, having adequate vents and drains and complete in all respects.

b. Filtered water line from overhead tank to process building and cooling water recirculation lines from cooking tower to process building are to be laid on top of false ceiling supported on the pipe rack. While laying these lines pipes may require bending to facilitate laying.

c. Overhead lines in the process and auxiliary buildings should be running at a maximum height of 6m from finished floor level and should be supported on M.S. pipe rack, welded/bolted to the main truss member. Suitable supports and clamps are to be provided for supporting pipes from the truss, wherever required.

d. After erection of entire pipeline it shall be tested with drawing inert gas at a pressure of 100 psig. After satisfactory testing the line should be thoroughly cleaned with wire brushed and sand paper. Thereafter, 2 coats of primers shall be applied followed by two coats of synthetic enamel paint as per color codification.

x. Schedule

a. The contractor shall be responsible to erect, test and commission all the piping work covered under the scope of work within the prescribed schedule of activities to be intimated during signing of contract.

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SPECIFICATIONS

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Valve Specifications, Gate/Globe/Check/Needle/Plug

Specifications	A	B	C	D	E	F
- Rating	46kg.cm.g. BS-10 Tab. 5 or class 600	10 kg.cm.g. Class 150	10 kg.cm.g. Class 150 or BS-10 Tab. F	12 kg.cm.g. Class 150 or BS-10 Tab. F	7 kg.cm.g. (Note 8, 9,10)	Class-800 Forged Steel
- Pipe Connections	Spec. E	Spec.A E -1 C	Spec.A B C	Spec.D B	Spec.A E C	Spec.E B E-1 D
Material :						
- Body/ Bonnet	Cast Steel A-216 Gr.	Bronze B-62 or	Bronze B-62 or	Caste Steel A-216 Gr.	Cast Iron IS-210	Forged Steel A-105
- Working Parts (Trim/ Disc/Seat/ Plug etc.	13% A-182 Gr. F-6	AISI Type 304 SS	AISI Type 304 SS	13% Cr. A-182 Gr. F-6	Cast Bronze Brase, B-61 B-62, or Manufacturers Alloys, SS 304	13% Cr. A-182 Gr. F-6
CONSTRUCTION :						
- Ends	Flanged RF	Screwed	Flanged RF	Flanged RF	Flanged RF	Screwed
- Seat/Seat Ring	Renewable	Renewable	Renewable	Renewable	Renewable	Renewable
- Wedge	Solid	Solid	Solid	Solid	Solid	Solid
- Bonnet	Bolted	Screwed	Bolted	Bolted	Bolted	Bolted
- Stem	Outside Screw & Yoke rising Stem	Inside Screw & rising Stem	Outside Screw & Yoke rising Stem	Outside Screw & Yoke rising Stem	Outside Screw & Yoke rising Stem	Outside Screw & Yoke rising Stem
- Disc	Renewable	Renewable	Renewable	Renewable	Renewable	Renewable
-Plug	Renewable	Renewable	Renewable	Renewable	Renewable	Renewable

Note : (Carbon Steel & Bronze)

i. Bronze valves shall have manufacturer's standard trim unless otherwise specified.

ii. Screwed, socket welding, or flanged C.S. GA & GL valves shall have trim of 13% Cr. Steel (AISI Type 410)

iii. All C.S. check valves shall have trim of 13% Cr. Steel (AISI Type 410)

iv. Valve packing shall be composed of braided asbestos rings.

v. The bonnet joint, in case of C.S. valves shall contain a corrugated soft iron or spiral wound gasket and in case of C.I. valves it should contain no asbestos gasket.

vi. End flange drilling, in case of C.S. valves shall be according to ASA B-16.5 and in case of cast iron valves it should be according to ASA B-16.1.

vii. For steam service (HS & MS) coming under the scope of IBR, valve shall be tested and test certificate in form III-C shall be required duly countersigned by IBR Authority or its approved representatives.

viii. Valves of Spec. E are as per IS: 780, CL-1 for 50 to 300mm and IS-2906 CL-1 for 350 to 900mm.

ix. Valves of spec. E shall have flanges as per ES-10 table E.

x. Valves of Spec. E shall have SS (AISI type 304 or 410) in place of bronze or brass for services for process fluids with caustic soda, alum, milk of lime and for pulp.

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DATA SHEET : PIPE SPECIFICATION - B

Service	**:**	**LS, CS, WH, WF, WP, AP**
Maximum Operating Temperature	**:**	**120 Deg. C**
Maximum Operating pressure	**:**	**10 kg/cm. sq. g**

Pipes

15mm - 40 mm NW	:	Seamless or electric resistance welded, material as per IS:1239 (ASTM A-53 Grade A or B). Heavy wall thickness.
50mm - 150mm NW	:	Seamless or electric resistance welded, material as per IS : 1239 (ASTM A-53 Grade A or B), Heavy wall thickness.
200mm NW & Higher	:	Seamless or electric resistance welded, material as per API-5L (6.4mm) minimum wall thickness or (ASTM A-53 Grade A or B).
Flanges	:	Slip-on flat face flanges, material as per IS:1875 Class II or IV (ASTM A-181, Grade I or II, drilling and dimensions as per ASA B 16.5 or BS-10, Table F.R.F.

Fittings

Elbow

15mm - 40 mm NW	:	Screwed type - 3000 lb; forged carbon steel, ASTM-A105 Grade I or II or equivalent, long radius bend or cold formed from pipes A53, GR.B bends having a minimum radius of pipe diameter.
50 mm - 150 mm NW	:	Butt welding type - standard long radius bend, material ASTM A234, Grade WPA or WPB or equivalent, as per ASA B16.9 or may be 2 cut 3 pieces mitre fabricated from pipes ASTM-A53 Gr.B (Sch. 40 wall thickness for pipes up to 200mm NW and 7mm minimum wall thickness for 300 mm NW and above.
200 mm NW & above	:	Butt welding type - Regular long radius bend, material ASTM A-234, Grade WPA or WPB, as per ASA B16.9 or may be 2 cut 3 pieces mitre fabricated from pipes

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		IS:1978 (6.4mm) heavy wall thickness for pipes up to 250mm NW and (6.4) minimum wall thickness for 300 mm NW and above.
Branches		
15 mm - 40 mm NW	:	For equal pipe connection, screwed type 150 lb. malleable iron tees shall be used. Material ASTM A 197 or equivalent.
50 mm NW & Above	:	For equal pipe connection, regular butt- welding tees shall be used. Material is ASTM A-234 Grade WPA or WPB, or equivalent as per ASA B16.9 For all reducing size branch connection, nozzle welding shall be employed.
Reducers		
40 mm NW & Smaller	:	150 lb malleable iron reducer, screwed type, material ASTM A-197 or equivalent or fabricated from pipes.
50 mm NW & Higher	:	Butt-welding type reducer, material ASTM A 234, Grade WPA or WPB or equivalent as per ASA B16.9 or m pipes. Couplings
40 mm NW & Smaller	:	Screwed type, 150 lb malleable iron couplings, material ASTM A-197 or equivalent.
Unions		
40 mm NW & Smaller	:	Screwed type 150 lb. malleable iron (brass to iron seat) material ASTM A-197 or equivalent.
Gaskets		
For Flat Face Flanges	:	1.5 mm (1/16") thick, cut full face asbestos gaskets.
For Raised Face Flanges	:	1.5 mm (1/16") thick, cut flat ring asbestos gaskets.
Bolts & Nuts	:	Hexagonal head carbon steel machine bolts, hexagon nuts, material as per IS-1364 or equivalent (ASTM-A 307 Gr. B)
General Notes	:	1. Pipes joints up to 40mm shall be screwed type and 50mm and above shall be welded type. 2. Number of flanges should be kept minimum

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DATA SHEET : PIPE SPECIFICATION - C

Service	:	**WD & IA**
Max. Operating Temp.	:	**40 Deg. C**
Max. Operating Pressure	:	**7 kg / cm. sq. g**

Pipes

15mm - 40 mm NW	:	ERW pipes, material as per IS:1239 (ASTM A-53 Grade A or B), Heavy wall thickness, galvanized.
50mm - 150mm NW	:	ERW pipes, material as per IS:1239 (ASTM A-53 Grade A or B), Heavy wall thickness, galvanized.
Flanges	:	Screwed type - 150 lb malleable iron fittings as per ASTM A-197, galvanized, or equivalent, or cold formed from pipes, bends having a minimum radius of 1.5 pipe diameters.

Fittings

Elbow

15mm - 150 mm NW	:	Screwed type - 150 lb; malleable iron fittings as per ASTM A-197 galvanized, or equivalent, or cold formed from pipes, bends having a minimum radius of 1.5 pipe diameters.

Branches

15 mm - 150 mm NW	:	For all branch connections, screwed type 150 lb. malleable iron tees shall be used, material is ASTM A-197 galvanized or equivalent.

Reducers

150 mm NW & Smaller	:	150 lb malleable iron reducer screwed, type, material ASTM A-197 galvanized or equivalent.

Couplings

15 mm - 40 mm NW	:	Screwed type, 150 lb malleable iron couplings, material ASTM A-197, galvanized or equivalent.

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Unions

15mm - 40 mm NW	:	Screwed type 150 lb malleable iron brass to iron seat, material ASTM A-197 galvanized or equivalent.

Gaskets

For Flat Face Flanges	:	1.5 mm (1/16") thick cut full face asbestos gaskets.
For Raised Face Flanges	:	1.5 mm (1/16") thick cut flat ring asbestos gaskets.
Bolts & Nuts	:	Hexagonal head, carbon steel machine bolts, hexagon nuts, material as per IS-1364 (ASTM-A 307 Gr. B)
General Notes	:	Number of flanges should be kept at minimum.

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DATA SHEET : PIPE SPECIFICATION - D

Renting Temp. (Deg. C)	**:**	**230**	**260**	**285**	**315**	**340**	**370**	**425**
BS 10 Table F Pressure (kg/cm. sq. g)	**:**	**20**	**19**	**17**	**16**	**14.5**	**13,**	**10**

Service : MS

Pipes

15mm - 40 mm NW	:	Seamless or electric resistance weld; materials: ASTM A-53, grade B; Sach. 80 wall thickness.
50mm & above	:	Seamless or electric resistance welded; materials: ASTM A-53, grade B; Sch. 40 wall thickness.
250mm NW & Higher	:	Seamless or electric resistance welded; materials : ASTM A-53, grade B; or API-5L 6.4mm minimum wall thickness. (Sch.40)
Flanges	:	Class ASA-150 slip-on raised face flanges; material as per IS:1875 Class II or IV (ASTM A181, Grade I or II), drilling and dimensions as per ASA. B16.5 or BS 10 Table FRF.

Fittings

Elbow

15mm - 40 mm NW	:	Screwed type - 3000 lb; forged carbon steel, ASTM A-105 Grade I or II or equivalent, long radius bend or cold formed from pipes A-53, GR.B bends having a minimum radius of pipe diameter.
50mm - 150 mm NW	:	Butt welding type - standard long radius bend, material ASTM A-234. Grade WPA or WPB or equivalent, as per ASA B16.9 with bend radius as 1.5 diameters
200mm NW & above	:	Butt-welding type-std. long radius bend, material ASTM A-234, Grade WPA or WPB or equivalent, as per ASA B16.9 or may be 2 cut 3

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		pieces meter fabricated from pipes ASTM A-53 Gr. B (Sch.40 wall thickness for pipes up to 200mm NW and 7mm minimum wall thickness for 300mm NW and above.
Branches		
15 mm - 40 mm NW	:	For equal pipe connection, screwed type 3000 lbs tee shall be used; material ASTM A-105 Grade I or II.
50mm NW & above	:	For equal pipe connection, butt welding tees shall be used, material ASTM A234 Grade WPA or WPB or equivalent as per ASA B16.9
Reducers		
15 mm - 40mmNW	:	Screwed type 3000 lbs reducer, material ASTM A-105 Grade I or II or equivalent.
50mm NW & higher	:	Butt-welding type reducer, material ASTM A-234, Grade WPA or WPB or equivalent as per ASA B16.9 or fabricated from pipes.
Couplings		
15 mm - 40 mm NW	:	Screwed type, 3000 lb couplings, material ASTM A105 Grade I or II or equivalent. Or Socket welding type 3000 lbs couplings, material : A-105 Gr. I or II or equivalent as per ASA B16.11
Unions		
15mm - 40 mm NW	:	Screwed type 3000 lbs with conical seats. Material : ASTM A 105 Grade I or Ii, or equivalent.
Gaskets		
To 250 deg. C Maximum	:	1.5 mm (1/16") thick cut flat ring asbestos gaskets.
Above 250 deg. C	:	5 mm (3/16") thick, corrugated metal strip of stainless steel, type 304 or equivalent, spirally wound asbestos filled with centering ring.

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Bolts & Nuts	:	Hexagonal head carbon steel machine bolts, hexagon nuts, material as per IS-1364 or equivalent (ASTM-A 307 Gr. B)
General Notes	: i.	For steam service coming under the scope of IBR, all pipes, fittings, valves, traps and strainers, shall be tested and test certificate in form III a for pipe and III C for others, respectively shall be required duly countersigned by IBR authority or its approved representatives. For flanges material test certificates for Sulphur and Phosphorous 0.05% max. each and carbon 0.025% max. shall be required.
	ii.	The bends upto 6" NB shall be hot bends with 1.5D radius.
	iii.	The bends above 6" NB shall be of mitre bends with R=1.5D (4 pieces). All welds shall be radio graphed as per IBR regulations.
	iv.	BW & BE stand for Butt welded and Bevel ends respectively.
	v.	The test pressure for pipes should be minimum 500 psi or 2 times working pressure, whichever is more.
	vi.	Flanges for M.S. steam services coming under the cope of IBR, should be welded as per Fig. No. 33 of IBR. CL 357.
	vii.	Pipe joints upto 40 mm shall be screwed type and 50 mm and above shall be welded type.
	viii.	Number of flanges should be kept minimum

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COLOUR CODE FOR THE IDENTIFICATION OF PIPELINES

The system of color coding consists of ground colour and colour bands superimposed on it.

Ground Colour

Ground colour identifies the basic nature of the fluid carried and also distinguishes one fluid from another.

Application

Ground colour shall be applied in one of the following ways.

1. Throughout the entire length.
2. As a colour coating of adequate length, so that it is not mistaken for a colour band.

Wherever the ground colour is not applied throughout the entire length, it shall be applied near valves, junctions, joints, service appliances, bulkheads, walls etc.

When colour bands are superimposed on the ground colour, the ground colour shall extend sufficiently on both sides of the colour bands to avoid confusion.

GROUND COLOURS

S. No.	Substance	Colour
1.	Water	Sea Green
2.	Steam	Silver Grey
3.	Acids and Alkalis	Dark violet
4.	Air	Sky blue
5.	Other liquids	Black

Colour Bands

Colour bands are superimposed on the ground colour to distinguish.

1. One kind or condition of a fluid from another kind or condition of the same fluid or
2. One fluid from another but belonging to the same group e.g. diesel fuel from furnace fuel or boiler feed water from drinking water.

Where the ground colour is applied throughout the entire length, colour bands shall be applied near the valves, junctions, walls etc.

Colour bands shall be arranged in the sequence shown in the table given below and the sequence follows the direction of flow.

The relative proportional widths of the first colour band and the subsequent bands shall be 4:1.

The minimum width of the narrowest colour band shall be 25mm.

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Valves shall be painted with the same colour as the main pipelines. Oil Light Brown

COLOUR CODE FOR GENERAL SERVICES

CONTENTS	GROUND COLOUR	FIRST COLOUR BAND	SECOND COLOUR BAND
WATER			
Cooling process	Sea Green	Fresh Blue	--
Boiler feed	Sea Green	--	--
Condensate	Sea Green	Light Brown	--
Drinking	Sea Green	French Blue	Signal Red
Hot	Sea Green	Light Grey	--
Sea, River Untreated	Sea Green	Whit	--
Treated	Sea Green	Light Orange	--
AIR			
Compressed (Upto 15kg/cm.sq.)	Sky blue	--	--
Vacuum	Sky blue	Black	--
OIL			
Diesel	Light Brown	Brilliant Green	--
STEAM			
High pressure	Silver grey	Signal Red	--
Medium pressure	Silver Grey	Cannary yellow	--
Low Pressure	Silver grey	--	--
Drainage	Black	--	--
Fire Service	Fire Red	--	--
Process Fluids & Slurries	Light grey	--	--
PULP			
Unbleached pulp	Light Grey	Cream	Deep Orange
Bleached pulp	Light Grey	Cream	Signal Red

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LIQUOR			
Liquor Black	--	Black	Canary yellow
Liquor cooking	--	Light blue	White
CHLORINE, DRY, GAS	Canary Yellow	--	--
WHITE WATER	Green	Light grey	White
BACK WATER	Green	Light grey	--
COUCH PIT STOCK	Green	Black	White

DISTINCT SHADES OF COLOURS TO BE USED FOR CODING

Colour	Shad No. and its description According to IS-5-1961
Black	Black
Blue	101 Sky Blue 166 French Blue
Brown	410 Light Brown
Green	217 Sea Green 212 Brilliant green
Grey	628 Silver grey 631 Light grey
Red	536 Fire red 537 Signal red
Yellow	309 Cannary yellow 397 Jasmine yellow 356 Golden yellow
White	White

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NAFED

Water Pumping, Treatment & Distribution System

TECHNICAL SPECIFICATIONS SHEET
FOR
WATER PUMPING, TREATMENT & DISTRIBUTION

1. INTRODUCTION

The main use of water in a honey processing unit is for bucket washing & the recurrent floor washing in the de-crystallizer area and raw honey storage area. Honey is a sticky substance and hence cleanliness in spillage prone area is achieved only via recurrent washing using water and sometimes high pressure steam jet. For both these methods of cleaning a sustained flow of water needs to be maintained. Hence it has been proposed to install a system so that the availability of water is guaranteed.

2. SCOPE OF WORK

The contractor's scope of work under this tender sub-head is to supply, install and commission a water system for use in the honey processing unit achieved by means of a Bore-well Submersible Pump, Multi Grade Filter (MGF), Activated Carbon Filter (ACF), Two no.'s 5 KL HDPE Overhead water storage tank and complete network of interconnected G.I. piping with suitable valves & instrumentation devices.

3. SCHEDULE OF QUANTITIES

i. For One No. Bore-well (Except for the prerequisite Civil Works)

Sr. No.	DESCRIPTION OF ITEM	UNIT	QTY
1.	Providing and installation of delivery GI pipe 65mm Inner Dia. B Class (75 mtr/246 feet) of reputed make such as Jindal, Tata etc conforming to IS:1239 Part-1.	rmt	75
2.	Providing and installation of submersible pump of capacity 12.5 HP and capable of extracting water up to 18,000 liters/hour of reputed make such as KSB/Kirloskar/Crompton Greaves or eqvt.	each	1
3.	Providing pea gravel of nominal size 1-3 mm.	Cu. m	26

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4.	Providing, installation and commissioning of distribution panel cum starter with automatic bypass facility complete in all aspects of reputed make L&T, Havells, ABB etc.	each	1
5.	Providing , installation of 3C copper cable 6mm in bore well for commissioning of submersible pump of reputed make such as Polycab, Finolex, KEI etc.	rmt	100

ii. Multi Grade Filter (MGF)

Multi Grade Filter shall consist of vertical pressure sand filters that contain multiple layers of coarse and fine sand (pebbles and gravels) in a fixed proportion. It is a kind of a deep filter bed with adequate pore dimensions for retaining both large and small suspended solids and un-dissolved impurities like dust particles. The water from bore-well shall be fed to this filter to keep turbidity and T.S.S. under control (< 5ppm).

Detailed Specifications:

1. Flow rate : 18,000 lph
2. Vessel Diameter : 1500 mm / Vendor design
3. Vessel Height : 1800 mm / Vendor design
4. Shell thickness : 8 mm
5. Dish thickness : 8 mm
6. Filtration media : 1600 Kg
7. Pressure vessel, MoC : MSEP (Mild steel epoxy coated)
8. Piping, MoC : Mild steel rubber coated
9. Frontal Piping : 100 NB/ Vendor design
10. Backwash : Manual backwash
11. Collection system : Header/ Lateral
12. Valve type : Butterfly valve
13. Optional Features
    - : Automatic backwash controls
    - : Pre/ post filter gauges
    - : Air blower
    - : ASME stamped (steel vessel)
    - : SA 516 Grade 70 carbon steel
    - : NABL testing certificates

iii. Activated Carbon Filter (ACF)

The filtrate of MGF shall be fed to the ACF. The purpose is to free the water from chloramines (chlorine & ammonia mixture) and organic compounds so that it is fit for further industrial uses.

Detailed Specifications:

1. Flow rate : 18,000 lph
2. Vessel Diameter : 1500 mm / Vendor design
3. Vessel Height : 1800 mm / Vendor design
4. Shell thickness : 8 mm
5. Dish thickness : 8 mm
6. Activated Carbon : 1300 Kg
7. Pressure vessel, MoC : MSEP (Mild steel epoxy coated)
8. Piping, MoC : Mild steel rubber coated
9. Frontal Piping : 100 NB/ Vendor design
10. Backwash : Manual backwash
11. Collection system : Header/ Lateral
12. Valve type : Butterfly valve
13. Optional Features
    - : Automatic backwash controls
    - : Pre/ post filter gauges
    - : Air blower
    - : ASME stamped (steel vessel)
    - : SA 516 Grade 70 carbon steel
    - : NABL testing certificates

iv. Two no.'s 5 KL HDPE Water Storage Tank

The two no.'s of overhead plastic tank shall be placed on a steel structure. Water from underground tank shall be fed to these tanks for daily uses in the factory. The contractor is required to procure, supply, install and commission these water tanks.

Detailed Specifications:

1. Volumetric capacity : 5,000 lph
2. Number of tanks 02
3. MoC : High density cross linked polyethylene
4. Duty : Potable grade water
5. Wall thickness : As per ASTM D 1988

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

6. Lifting lugs 3
7. Factory Test Report
   : Wall thickness verification
   : Fitting placement verification
   : Visual inspection
   : Impact test
   : Gel test
   : Hydrostatic test
8. Warranty : OEM warranty certificate
9. Fittings
   : Ladder (G.I.)
   : Inlet nozzle
   : Discharge nozzle
   : Drain
   : Level indicator
   : Overflow

v. Schedule of Quantities for Interconnecting Water Piping Network

S. No.	Description	Quantity	Unit
1	**GI Pipes IS 1239; ASME B36.10M; Schedule 40**		
i.	50 NB	150	meter
ii.	25 NB	48	meter
2	**Elbow 90 Degree (as per ASME B16.9)**		
i.	50 NB	10	no.'s
ii.	25 NB	6	no.'s
3	**Flange- SORF #150 (as per ASME B16.5)**		
i.	50 NB	40	no.'s
ii.	25 NB	20	no.'s
4	**Reducers (as per ASME B16.9)**		
i.	65 x 50 NB	4	no.'s
ii.	50 x 25 NB	10	no.'s
iii.	50 x 40 NB	8	no.'s
5	**Equal Tee (as per ASME B16.9)**		
i.	50 x 50 NB	5	no.'s
ii.	25 x 25 NB	5	no.'s
6	**Ball Valve- (as per ASME B16.34)**		
i.	50 NB	10	no.'s
ii.	25 NB	10	no.'s
7	**Y- Strainer**		
i.	50 NB	2	no.'s
8	**Non Return Valve**		
i.	50 NB	2	no.'s

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9 **i.**	**Butterfly Valve** 50 NB Make: L&T/ VIP/ AMCO	16	no.'s
10 **i.** **ii.**	**Gasket- EPDM, 3 mm thick** 50 NB 25 NB	 20 2	 no.'s no.'s
11 **i.**	**Blind Flange** 50 NB	 2	 no.'s
12 **i.** **ii.**	**Studs, Bolts & Washer** M16 x 75 lg M14 x 55 lg	 160 80	 no.'s no.'s
13	**OH Tank Water Filling Pump** Duty = Water at ambient temp. Flow = 15 cu. M / hr NPSH = 20 meter Type = Centrifugal Make: Kirloskar/ Crompton/ Havells	2	no.'s

The contractor is required to supply, erect/ install and commission this piping network.

4. GENERAL & SPECIAL TERMS OF CONTRACT

Kindly refer to the terms & conditions as detailed out in the PROCESS & UTLITY PIPING tender head.

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FIRE FIGHTING SYSTEM

TECHNICAL SPECIFICATIONS SHEET
FOR
FIRE FIGHTING SYSTEM

1. INTRODUCTION

It has been proposed to install a fire fighting system as per the applicable building and industrial laws.

2. SCOPE OF WORK

The contractor is required to design, supply, erect and install the firefighting system on a turnkey basis.

3. SCHEDULE OF QUANTITIES AND BRIEF SPECIFICATION

The exact quantities of the various items shall depend on the site conditions. The table below is a tentative list for further perusal at the time of execution.

SETTING-UP OF HONEY COLLECTION PROCESSING
INFRASTRUCTURE AND FACILITIES UNDER N.B.H.M BY N.A.F.E.D

Sr. No.	Description of Items	Qty	Unit
A	**SUB HEAD -I (PUMP ROOM)**		
1	Supplying Installation, testing and Commissioning of **electric driven main fire pump** suitable for automatic operation and consisting of following Complete in all respect as required.		
a)	Horizontal type, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal to ensure a minimum pressure of 3.5 kg/sq.cm. at highest and farthest outlet at specified flow of 2280 LPM and 60 Metres head conforming to IS 1520.		
b)	Suitable HP Squirrel cage induction motor, TEFC, synchronous speed 2900 RPM, suitable for operation on 415 volts, 3 phase 50 Hz. AC with IP 55 protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325.		
c)	M.S. fabricated Common base plate coupling, coupling guard, foundation bolts etc. as required.		
d)	Suitable Cement Concrete foundation with cement concrete plaster as per manufacturers design, complete with anti-vibration arrangement.	1	Sets
2	Supplying, Installation, Testing and Commissioning of **diesel engine driven main fire pump** suitable for automatic operation and consisting of following : complete in all respect as required.		
a)	Horizontal type, centrifugal, pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal to ensure a minimum pressure of 3.5 kg/sq.cm. at highest and farthest outlet at specified flow of 2280 LPM at outlet head 60 Metres conforming to IS 1520.		
b)	Suitable HP 1800 RPM diesel engine conforming to BS :649/IS:1601/IS:10002 all amended upto date, continuous duty, multi cylinders vertical 4 stroke cycle water cooled, developing suitable BHP at operating speed specified to drive the fire pump capable of driving continuous non-stop operation for 2 hours.		
c)	Common bed plate fabricated out of MS channel of suitable size for assembling the Pump and the Engine, flexible coupling and with coupling guard for protection/safety.		
d)	Making cement concrete foundation of 1:2:4 ratio (1 Cement: 2 coarse sand : 4 graded stone aggregate 40 mm nominal size) duly plastered suitable for Diesel engine pump set including vibration isolation by providing cushy foot mount pads as necessary, foundation bolts, brackets, clamps, fixtures, grouting etc, in accordance with manufacturer's design etc.as per specification complete as reqd.	1	Set
3	Supplying, Installation, Testing and Commissioning of electric driven pressurisation pump suitable for automatic operation and consisting of following: complete in all respect as required.		

a)	Horizantal end suction, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal and flow of 180 LPM at 60 metre head conforming to IS:1520.		
b)	Suitable HP 2900 RPM SQ cage induction motor TEFC, synchronous speed 2900 RPM, suitable for operation on 415 volts, 3 phase 50 HZ. AC with IP 55 class of protection for enclosure, horizontal foot mounted type with Class-'F insulation, conforming to IS : 325.		
c)	Suitable CC foundation of 1:2:4 ratio (1 Cement: 2 coarse sand : 4 graded stone aggregate 40 mm nominal size) duly plastered and with anti vibration pads.	1	Set
4	Fabricating, Supplying, Installation, Testing and Commissioning Air Vessel of continuous welded construction with flanged discharge header in pump house fabricated out of 10 mm thick MS sheet, Air Release Valve, complete with drain arrangement with 25 mm dia gun metal ball valve complete with all accessories etc. as required of the following sizes		
5	2 Meter high and 450 mm dia suitable to operate Jockey Pump, Main Fire Pump & Diesel Engine Driven Fire Pump complete with all pressure switches as per specifications as reqd.	1	Nos.
6	Providing and Fixing of "C" class grade MS Pipe IS:1239 (part-I) with special accessories such as tees, elbow, flanges, rubber insertion, nut and bolts, welded joints with suitable iron, clamps, brackets etc., painting of Two coats of Primer & One coat of Red Paint		
a)	200mm dia	12	Mtr
b)	150 mm dia	42	Mtr
c)	80mm dia	12	Mtr
d)	25 mm dia	6	Mtr
7	Providing, fixing, testing & commissioning of CI Butterfly Valve (suitable for test pressure of 15 kg / sqcm) with flanges, nut bolts, gaskets, painting and necessary pad locking arrangement complete required.		
a)	80mm	2	Each
b)	150mm	6	Each
8	Providing, fixing, testing and commissioning of C.I. Slim Seal wafer type Non-Return Valve (As per IS:5312) of pressure 15 Kg/sq.cm with flanges, Nut, bolts & washers, painting etc. complete as required.		
a)	80 mm dia	1	Each
b)	150mm	3	Each
9	Fabricating, supplying, installation, testing and commissioning of electrical control panel of cubical construction,floor mounted type , fabricated from 2 mm thick CRCA sheet compartmentalised with hinged lockable doors, dust and vermin proof, powder coated of approved shade after 7 tank treatrment process,cable alley,inter connection, having switchgears and accessories mounting and internal wiring, earth terminals numbering etc complete in all respect ,suitable for operation on 415 V ,3 phase,50 Hz AC supply with enclosure protection class IP 42 as reqd		
	PANEL IN FIRE PUMP HOUSE	1	Each
10	Providing & Fixing Pressure switch in the M.S Pipe Line including connection etc. as required.	1	Nos.

11	Supplying and Laying of PVC 1.1 KV grade armoured U.G. Cable of following sizes on surface/in existing cable tray suitably clamped as required.		
a	3 x 70 Sqmm(aluminium conductor)	12	Mtrs.
b	3 x 10 Sq mm (aluminium conductor)	6	Mtrs.
c	2 x 1.5 Sq mm (Copper conductor)	30	Mtrs.
12	Supplying and making end termination with brass compression gland and Al. lugs for following sizes of PVC insulated, PVC sheathed/ XLPE Al. conductor cables of 1.1 KV grade as required.		
a	3 x 70 Sqmm	4	Sets
b	3 x 10 Sq mm (For Copper conductor)	2	Sets
13	Suppling and fixing following sizes of perforated pre-painted M.S cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts and nuts, painting suspenders etc as required.		
a	150 mm.	12	Mtrs.
b	50 mm	6	Mtrs.
14	Providing and fixing 25 mm x 5 mm G.I.Strip in on surface or in recess for loop earthing complete etc. as required.	70	Mtrs.
15	Providing,fixing,testing and commissioning 100 mm dia pressure gauge of range 0 -015 Kg / sqcm conforming to IS - 3624 having bourdon tube of stain steel 310 in cast aluminium,stove enamelled, black, weather proof case with outer, screwed aluminium bezel and complete with necessary U-type stainless steel siphon tube and cock complete as required.	3	Nos
16	Providing and fixing mettalic expansion bellows vibration eliminators with flange suitable for raw water upto 45 deg. C. temperature working pressure 7 kg/ sq.cm and test pressure 14 kg/sq.cm.		
a	80mm dia	1	Each
b	150 mm dia	4	Each
3	Suplying, installing, testing and commissioning of following dia Y Strainer of ductile body flanged with stainless steel strainer as required.		
3.1	150 mm dia	2	Each
	SUB HEAD -II (Hydrants, Piping & Accessories)		
1	Providing and fixing M.S Pipe to **I.S. 1239 (Heavy class)** complete with all fittings like, unions, couplings, bends, elbows, tees, offsets,reducers, flanges as per table 'E' etc. to complete the work as per the requirement at site including painting with two coats of synthetic enamel paint, over the two or more coats of red oxide, upto the satisfaction of engineer in charge, cutting and making good the walls good complete		
a	150 mm dia	130	Metre
b	80 mm dia	60	Metre
c	65 mm dia	12	Metre
2	Providing and Fixing of 4 mm thick wrapping coating for under ground pipe for road crossing.		
a	80 mm dia	10	RM

3	Supplying of Butterfly valves of PN 1.6rating of following sizes with EPDM rubber lining seat and CF-8 stainless steel disc duly ISI marked and stainless steel stem with lever operation and cast iron body in powder coated finish for fire fighting application complete in all respects confirming to IS: 13095 as required.		
a	150mm dia	8	Nos.
b	80 mm dia	9	Nos.
4	Supplying and fixing Single Headed Internal Hydrant Valve oblique pattern with instantaneous Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked, conforming to IS : 5290 (Type A), with 80 mm dia flanged inlet, with ABS cap and chain complete with all accessories etc. as required.	8	Nos.
5	Supply, Installation, Testing and Commissioning 63 mm dia. 15 Mtr. Long RRL hose pipe with 63 mm dia. male and female stainless steel couplings duly binded with GI wire rivets etc. ISI marked, IS 636 (type-A) as required.	8	Nos.
6	Supplying and fixing 4 way fire brigade connection of cast iron body with 4 nos. Stainless steel male instantaneous inlet couplings complete with cap and chain as required	2	No.
7	Providing,fixing,testing and commissioning of one number Stainless steel fire brigade section hose coupling (Fire brigade withdrawal connection) i/c foot valve in the bottom etc. as per specification complete as required. (M.S pipe of 100 mm dia will be paid in pipe item.	1	Nos.
8	Providing and fixing flow switches in 100/150mm dia M.S Pipe as required.	3	Nos.
9	Providing & Fixing testing & commissioning of installtion control valve of cast iron body and brass/bronze working parts comprising of water motor alarm. Bronze seat clapper, and clapper arm, hydraulically driven mechanical gong bell to sound continuous alarm when the Wet riser/ sprinkler System activates, pressure gauges, emergency release,strainer, pressure switch, cock valve complete with drain valve and bypass, test control box, ball valves, MS pipe of required sizem flanges, orifice plate, gasket etc. of size 150mm dia as required.	1	Nos.
10	Supplying, Installation, Testing and Commissioning of standard Fire Man's axe with heavy insulated rubber conforming to IS : 926	4	Each
11	Supplying, installation, testing and commissioning of M.S cabinet size 750 mm x 600 mm x 250mm deep fabricated from 1.6mm thick complete with glass, locking arrangements.	8	Each
	SUB HEAD - III (FIRE EXTINGUISHERS & MISC)		
1	Providing and fixing with bracket/supports etc. wall mounted fire extinguishers as per detail below:		
1.1	Providing and fixing ABC type extinguishers consisting of welded M.S. cylindrical body, squeeze lever discharge valve 30 cms long high pressure discharge hose, discharge nozzle, suspension bracket, ISI marked as per IS:15683 finished externally with red enamel paint and fixed to wall with brackets complete with internal charges.	6	Each
	Capacity 6 lit.		

1.2	Providing and fixing CO2 extinguisher consisting of seamless MS cylindrical body squeeze lever discharge valve, internal discharge tube, 30 cms long high pressure discharge hose, discharge nozzle ISI marked as per IS:15683 including fixing with dash fasteners etc. complete.	2	Each
	Capacity 4.5 Kg		
1.3	Providing and fixing mechanical foam type (ISI marked) fire extinguishers consisting of welded M.S. cylindrical body squeeze lever discharge valve 30 cm long high pressure discharge hose, discharge nozzle suspension bracket as per IS:15683 marked finished externally with red enamel paint and fixed to wall with brackets complete with internal charger.	2	Each
	Capacity 50 lit.		
	SUB HEAD - IV (MISC.)		
1	Providing and fixingManual Call Point	3	Each
2	Providing and fixing Sounder .	1	Each
3	Providing and fixing 4 zone apnel.	1	Each
4	Supplying and Laying of PVC 1.1 KV grade armoured U.G. Cable of following sizes on surface/in existing cable tray suitably clamped as required.		
a	2 x 1.5 Sq mm (Copper conductor)	450	Mtrs.

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TENDER SPECIFICATIONS

OF

ELECTRICAL WORKS

Attachments

i. **General Specifications**
ii. **Summary**
iii. **Bill of Quantities**
iv. **Drawings**

ON TURNKEY BASIS
IN
ESTABLISHING A HONEY PROCESSING UNIT

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

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GENRAL SPECIFICATIONS

1. SCOPE OF WORK

The general character and the scope of work to be carried out under this contract is illustrated in Drawings, Specifications and Schedule of Quantities. The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Owner's site representative. The Contractor shall furnish all labor, materials and equipment (except those to be supplied by the owner) as listed under Schedule of Quantities and specified otherwise, transportation and incidental necessary for supply, installation, testing and commissioning of the complete system as described in the Specifications and as shown on the drawings. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the Drawings/Documents as being furnished or installed, but which are necessary and customary to be performed under this contract. The scope of work shall generally comprise, but not limited to the following:

a) HT Panel -11kV Switch Gear with VCB Circuit Breaker.
b) 11/0.415kv Transformer Works
c) HT/LT Power and Control Cables.
d) 415V PCC Panel/, Automatic Capacitor Control Panels, MDB/SDB/Feeder Pillar, DB's, etc.
e) Cable trays, earthing station/materials
f) Internal Electrical Works
g) Any other items specified in Schedule of Quantities.

Comply in full with all requirements described in or implied by his specification and with the Conditions of Contract as well as Schedule and Drawings issued as part of the contract documents.

Request clarification and make all necessary enquiries prior to submitting the tender regarding any obscurities or contradictions on or omissions from the specification, related Documents and Drawings. No consideration will be given to cost claims for work arising from the failure to obtain such clarification.

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Minor civil works like drilling and punching holes and openings in concrete floors, slabs, chasing of brick walls, fabrication of supporting structures, drainage of water from cable trenches, cleaning and clearing of all debris due to electrical installation.

Excavation, scaffolding and back filling for direct burial of cables and earthing conductors as applicable.

Preparation of execution drawings and as built-in- drawings.

Coordination with other contractors with regard to installation of items in Electrical Contractors scope.

The extent of work services under the contract include all items shown on the drawings, indicated in companion with specifications, not-withstanding the fact that such items have been omitted from the price schedule. All equipments and services which are required to complete the intent of the contract shall also be deemed to be within the scope of the contract.

Training of Owner's Staff.

2. ITEMWISE BRIEF SPECIFICATIONS

2.1 HT PANEL

System Details :-

Rated Voltage	: 3 Phase, 11KV ± 10%.
Maximum System Voltage	: 12 KV
Rated Current	: 630 Amp
Fault Level	: 350 MVA
Rated Frequency	: 50 Hz
Ambient Temperature	: 45^{o}C
System Earthing	: Non effectively earthed
Degree of Protection	: IP 42
Atmospheric Condition	: Humid and Dusty

STANDARD & CODES:

Unless otherwise stated, HT switch board shall conform to the following relevant Indian standards and Indian Electricity Rules and Regulations.

i) IS-2516 : Circuit Breakers

ii) IS-3427 : Metal enclosed switchgear and control gear for voltage above 1000V but not exceeding 11000V A.C.

iii) IS-4237 : General requirement for switchgear and control gear for voltages not exceeding 1000Volts.

iv) IS-8828 : Miniature Air break circuit Breakers for voltages not exceeding 1000V.

v) IS-4064 : Air break switches. Air break disconnectors, air break switch disconnectors and fuse combination units for voltage not exceeding 1000V AC or 1200V DC.

vi) IS-2959 : Contactors for voltages not exceeding 1000V AC or 1200V DC.

vii) IS-8544 : Motor starters for voltages not exceeding 1000V AC or 1200V DC.

viii) IS-2705 : Current Transformer

ix) IS-3156 : Potential Transformer

x) IS-9385 : High voltage fuses

xi) IS-6875 : Control switches

xii) IS-1255 : H.T. Cables

xiii) IS-1248 : Electrical Direct acting indicating instruments

xiv) IS-722 : AC electricity Meter of Induction type

xv) IS-2544 : Porcelain post insulators for system voltage greater than 1000V.

xvi) IS-3231 : Electrical Relays

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

xvii) IS-5082 : Wrought aluminium and aluminium alloy bars etc. for electrical purposes

xviii) IS-2147 : Degree of protection provided by enclosures for low voltage switch gear and control gears.

xix) IS-375 : Marking and arrangement for switchgear, busbars, main connection and auxiliary wiring.

xx) IS-8623 : Factory built assemblies of switchgears and control gears for voltages up to and including 1000V AC & 1200V DC

xxi) IS-10118 : Code of practice for selection, installation and maintenance of fuses

xxii) IS-13118 : H.T. Circuit Breaker.

xxiii) IS-3725 : Resistance wire, tapes and strips for heating elements

xxiv) IS-9224 : Low voltage fuses.

H.T. CABLES:

GENERAL :

The cables shall be supplied, inspected, laid, tested and commissioned in accordance with Drawings. Specifications, Indian Standard Specifications IS : 1255-1967 and cable manufacturers instructions.

MATERIAL :

The H.T. cables shall be 11 KV, aluminium conductor CROSS LINKED POLYETHYLENE XLPE insulated steel tape armoured cable laid underground and or in masonry trenches as shown on Drawings. The conductor shall be made of Electrical purity aluminium wires and stranded together and compacted. The cable shall be of 3 Core type. The insulation shall be of high quality cross linked polyethylene applied by extrusion process. Both conductor and the insulator are provided with shielding made of Semi Conducting compound. Armouring is applied over inner sheath and shall be of flat steel strips. This shall be of black colour.

INSPECTION :

All cables shall be inspected upon receipt at site and checked for any damage during transit.

JOINTS IN CABLES :

The contractor shall take care to ensure that all the cables are procured in such a manner as to avoid jointing. This apportioning shall be got approved by the Owner/Consultant before the cables are cut to lengths. Where joints are unavoidable, the location of such joints shall be got approved by the Owner/Consultants. The H.T. Cable jointing shall be done only by authorised cable jointer.

JOINTING BOXES FOR CABLES:

Cable joint boxes shall be of appropriate size, suitable for aluminium conductor XLPE insulated cables of 11000 volts un-effectively earthed system.

JOINTING CABLES:

All cable joints shall be made in suitable, approved cable joint boxes. Jointing of cables in the joint boxes and the filling in of compound shall be done in accordance with the best practice in trade, in accordance with manufacturer's instructions and in an approved manner. All straight T-joints shall be done in epoxy mould boxes with TROPOLIN/M-SEAL epoxy resin or approved equal. All terminal ends of conductors shall be heavily soldered upto atleast 50mm length.

CABLE TERMINATIONS:

Cable termination shall be done in terminal cable box using cable glands and the cable ends sealed with sealing compound. The cable boxes of transformers shall be filled with bituminous compound manufactured by CCI or approved equal.

LAYING OF CABLES:

H.T. cables shall be laid either buried directly in hume pipe underground or in Masonry/Concrete trenches. The cable buried underground shall be at minimum depth of 1.2 mtr. from the ground level. Sand cushion of not less than 80mm shall be provided both above and below the cable with a protective

concrete slab on the top of the sand layer. The cable trench shall be back filled and compacted. H.T. Cable route marker shall be provided @ 30 mtr and where there is change in direction.

PROTECTION OF CABLES:

The cable shall be protected by placing precast reinforced 50mm, thick (1:2:4) concrete slabs 200mm wide on the top layer of sand for the length of the cable. Where more than one cable is running in the same trench, the concrete blocks shall cover all the cables and shall project minimum 80mm on either side of the cables.

TRANSFORMER: (Oil type)

SCOPE :

This specification generally describes the power transformers and associated auxiliary equipment for use on the electrical power distribution system suitable for outdoor installation and covers the design, manufacture, testing at works, supply and delivery, site erection, testing and commissioning aspects of the same. The details are given in the data sheet.

STANDARDS :

The equipment and accessories covered by this specification shall be designed, manufactured and tested in compliance with the latest relevant standards published by the Indian Standards institution wherever available in order that specific aspects under Indian conditions are taken care of.

The equipment and accessories for which Indian Standards are not available shall be designed, manufactured and tested in accordance with the latest standards published by any other recognized national standards institution.

The equipment shall also conform to the latest Indian Electricity Rules as regards safety, earthing and other essential provisions specified therein for installation and operation of electrical plants.

Generally the transformer shall conform to IS:2026, IS:10028 and unless otherwise stated.

LT SWITCHGEARS MAIN PCC PANELS & DISTRIBUTION BOARDS:

SCOPE :

This section shall cover supply, assembly, installation, connection, testing and commissioning of medium voltage cubicle type MV Switchgear, PCC Panel, FP and Distribution boards as described in these specifications, drawings and schedule of quantities. The distribution boards are designated as:

PCC Panels, MDB, SDB , Floor Panels, Distribution Board

The unit rate per item shall include design supply, assembly, installation, connection, testing and commissioning of MV Assembly Distribution boards, with all the components in place, internal wiring, as specified in this specification, and shown on the drawing, and load schedule complete with supply and fixing of M.S. channel/ angle iron support on wall/floor etc.

In case of switchgears and panels issued by owner for erection the unit rate shall include inspection, receiving, storage, installation, field testing and commissioning activities including co- ordination with the suppliers of the switchgears. The rate shall be quoted per set of switchgears/panels as identified in the BOQ. The details of design/Constructional features of these switchgears are specified here below.

SYSTEM DETAILS :

All the Main Panels/Motor control centers Distribution boards, Sub-Main Distribution boards, shall be suitable for operation on three phase/ single phase, 415/230 volts, 50 Hz neutral solidly grounded at transformer and short circuit level not less than 415 Volts at 50KA / 35 KA or as specified elsewhere.

The Distribution boards shall be designed to withstand tropical condition at site, with maximum expected ambient temperature of 45ºC and 100 percent humidity and dusty weather.

Enclosure of the switchboard shall have IP 52 protection for Indoor and IP 55 for outdoor.

STANDARDS AND CODES:

The Distribution boards shall comply with the latest edition of relevant Indian Standards and Indian Electricity Rules and Regulations. The following Indian Standards shall be complied with:

IS 1394 -	L.V. switchgear and control gear Part-I - 1993 General rules
IS 5578-85	Guide for marking of insulated conductors.
IS 11353-85	Guide for uniform system of marking and identification of conductors and apparatus terminals.
IS 2147-62	Degree of protection provided by enclosures for low voltage switch gear and control gears.
IS 2675-83	Enclosed distribution fuse boards and cutouts for Voltages not Exceeding 1000 V.
IS 2551-82	Danger notice plates.
IS13947-1993	Circuit breakers.(Part-II)
IS13947-1993	Switches, Disconnectors, switch disconnector (Part - III) and fuse Combination units.
IS 1818-72	Alternating current isolators (disconnectors) and earthing switches.
IS 8623-77	Factory built assembles of switchgear and control gear for voltages upto and including 1000 V AC & 1200 V DC.
IS 8828	Miniature air break circuit breakers for voltages not exceeding 1000 V.
IS 9926	Fuse wires used in re-wirable type Electric fuses upto 1100 Volts.
IS 2208	HRC fuse links
IS 2705	Current Transformers(Part- I,II & III)

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

IS 3156	Voltage Transformers(Part- I,II & III)
IS 1248	Indicating Instruments
IS 722	Integrating Instruments
IS 13947-93	Control devices and switching elements.(Part - 5)Section-1
IS 13947-93	Contactors and motor starter section 1 (Part - 4) Electromechanical. Section-1
IS 3231	Relays
IS 375	Marking and arrangement of bus bars Indian Electricity Act and Rules.

CABLES AND CABLE TRAYS:

GENERAL SCOPE :

Supply, installation, storing, laying, fixing, jointing / termination, testing and commissioning of Medium Voltage XLPE insulated extruded PVC inner sheathed PVC overall Sheathed armoured aluminium/ copper conductor cables laid in built up trenches, directly buried underground, on cable trays, in pipes, clamped directly to wall or Structures etc. as called for in the drawing.

Type :

Medium voltage cables shall be circular, multicore annealed copper or aluminium conductor, XLPE insulated, PVC extended inner sheated an PVC overall sheathed and steel wire armoured or steel tape armoured construction or unarmoured. The conductors of cable shall be stranded. Sector shaped stranded conductors shall be used for cables of 50 sqmm size and above. The cables shall conform to IS:1554 part-I in all respects.

MV power cables shall be 2, 3, 3.5 or 4 cores, as required and shall have conductors made from electrical purity aluminium conductors conforming to IS:8130-84.

Conductors shall be insulated with high quality PVC base compound. Insulation and outer sheathing compounds shall conform to IS:5831 - 84.

A common covering shall be applied over the laid-up cores by an extruded sheath of un-vulcanised rubber compound.

Armouring of galvanised round steel wires or galvanised flat steel strips shall be provided over the inner sheath.

Outer sheath of PVC shall be extruded over the armouring cables shall be manufactured and tested in accordance with IS 1554 Part I.

Unless otherwise specified, all control cables shall be multicore, 1100V grade PVC insulated, armoured and overall PVC sheathed with stranded copper conductors of 2.5 sq.mm, conforming to IS 1554 Part I. Cores shall be identified by colour scheme of PVC insulation.

Rating :

The cables shall be rated for a voltage of 1100 Volts.

Core Identifications :

Cores shall be provided with the following colour scheme of PVC insulation

1. Single Core : Green yellow for earthing.
2. Two Cores : Red and Black, Blue & Black, Yellow & Black.
3. Three Cores : Red, Yellow & Blue
4. Four Core : Red, Yellow, Blue & Black

Selection of Cable:

Cables sizes shall be selected considering the current carrying capacity, voltage drop, maximum short circuit duty and the period of short circuit to meet the present and future anticipated loads.

While deciding cable sizes, the derating factors for type and depth of laying, grouping, ambient temperature, ground temperature and soil resistivity shall be taken into account.

STANDARDS :

The following standards and rules shall be applicable.

IS 1554	⇨	PVC insulated (heavy duty) electric cables Part I for working voltages up-to and including 1100 V.
IS 8130	⇨	Conductors for insulated electric cables and flexible cords.
IS 3961	⇨	Recommended current ratings for cables:(Part 2) PVC Insulated and PVC sheathed heavy duty cables.
IS 5831	⇨	PVC insulation and sheath of electric cables.

CABLE TRAY SPECIFICATION :

The cable tray shall be fabricated out of slotted/perforated MS sheets as channel sections, single or double bended. The channel sections shall be supplied in convenient lengths and assembled at side to the desired lengths. These may be galvanised or painted to the desired lengths. Alternatively, where specified, the cable tray may be fabricated by two angle irons of 50mm x 50mm x 6mm as two longitudinal members, with croses bracings between them by 50mm x 5mm flats welded/bolted to the angles at 1 m spacing. 2mm thick MS perforated sheet shall be suitably welded/bolted to the base as well as on the two sides.

Typically, the dimensions, fabrication details etc. are shown in CPWD General Specification for Electrical Works - Part II -External,1994.

The jointing between the sections shall be made with coupler plates of the same material and thickness as the channel section. Two coupler plates, each of minimum 200mm length, shall be bolted on each of the two sides of the channel section with 8mm dia round headed bolts, nuts and washers. In order

to maintain proper earth continuity bond, the paint on the contact surfaces between the coupler plates and cable tray shall be scraped and removed before the installation.

The maximum permissible uniformly distributed load for various sizes of cables trays and for different supported span are as per CPWD General Specification of Electrical Work Part II -1994. The sizes shall be specified considering the same.

The width of the cable tray shall be chosen so as to accommodate all the cable in one tier, plus 30 to 50% additional width for future expansion. This additional width shall be minimum 100mm. The overall width of one cable tray shall be limited to 800mm.

Factory fabricated bends, reducers, tee/cross junctions, etc. shall be provided as per good engineering practice. (Details are typically shown in figure3) of CPWD General Specification of Electrical Work Part II -1994. The radius of bends, junctions etc. shall not be less than the minimum permissible radius of bending of the largest size of cable to be carried by the cable tray.

The cable tray shall be suspended from the ceiling slab with the help of 10mm dia MS rounds or 25mm x 5mm flats at specified spacing as per of CPWD General Specification of Electrical Work Part II -1994. Flat type suspenders may be used for channels upto 450mm width bolted to cable trays. Round suspenders shall be threaded and bolted to the cable trays or to independent support angles 50mm x 50mm x 5mm at the bottom end as specified. These shall be grouted to the ceiling slab at the other end through an effective means, as approved by the Engineer, to take the weight of the cable tray with the cables.

The entire tray (except in the case of galvanised type) and the suspenders shall be painted with two coats of red oxide primer paint after removing the dirt and rust, and finished with two coats of spray paint of approved make synthetic enamel paint.

The cable tray shall be bonded to the earth Terminal of the switch bonds at both ends.

The cable trays shall be measured on unit length basis, along the center line of the cable tray, including bends, reducers, tees, cross joints, etc, and paid for accordingly.

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

WIRING SYSTEM :

SCOPE:

The scope of work under this section covers installation and wiring for lights, fans, exhaust fans, call bells, fan coil units, geysers and power sockets etc., The wiring shall generally be done using PVC insulated copper conductor multi strand wires FRLS in M.S./PVC conduits as called for including providing switches, sockets, plug tops, electronic fan regulators, outlet boxes etc.

STANDARDS:

The following latest standards and rules shall be applicable:

IS : 732	Code of practice for electrical wiring installation (System voltage not Exceeding 1100 V).
IS : 1646	Code of practice for fire safety of buildings (General) Electrical installation.
IS : 9537	Conduits for Electrical installations (Part 1-4)
IS : 2667	Fittings for rigid steel conduits for electrical wiring.
IS : 3480	Flexible steel conduits for electrical wiring.
IS : 3837	Accessories for rigid steel conduit for electrical wiring.
IS : 694	PVC insulated cables.
IS : 6946	Flexible (Pliable) non-metallic conduits for electrical installation.
IS : 1293	Plugs and sockets outlets of rated voltage upto and including 250 V.
IS : 8130	Specifications for conduits for electrical installation.
IS : 3854	Switches for domestic and similar purposes.
IS : 3419	Fittings for rigid non-metallic conduits.
IS : 4648	Guide for electrical layout in residential building.

IS : 4649	Adopters for flexible steel conduits.
IS : 5133	Boxes for enclosures of the Electrical.
IS : 4615	Switch socket outlets.
IS : 8884	Code of practice for installation of Electric bells and call system.
IS : 2551	Electric Danger notice plates.
IS : 3646	Code of practice for interior illumination.
IS : 371	Ceiling Roses.
IS : 302	General and safety requirements for household and similar electrical appliances.
IS : 3043	Code of practice for earthing.
IS : 5216	Guide for safety procedures and practices in electrical work.

Indian Electricity Act and Rules.

Regulations for the electrical equipment in buildings issued by the concerned Electrical Authorities.

All standards and codes mean the latest.

POINT WIRING FOR LIGHTS, FANS, EXHAUST & 6 AMPS CONVENIENCE SOCKETS:

A point wiring shall consist of the branch wiring from the distribution board together with a switch/electronic fan regulator as required, including providing conduit & accessories, pendant holder or a swan holder, or ceiling fan hook box or socket tc., with suitable termination. A point wiring shall include, in addition, the earth continuity conductor/wire from the distribution board to the earth pin/stud of the outlet/switch box/ light fitting & fans & all other such non current carrying metals shall be earthed and to the outlet points. No tee jointing or looping of wires shall be done any anywhere except at a switch box or a light fitting or a plug socket outlet.

The point wiring shall be carried out in the under mentioned manner :

Supply, installation, fixing of conduits and Steel wire/ G.I. pull wire with necessary accessories, junction/pull/ inspection/switch boxes and outlet boxes/Fan hook box etc. However Switches, Switch plates & switch boxes are not required for the lights which are controlled directly from the MCB DB's.

Supplying and drawing of wires of required size including earth continuity PVC insulated wire.

Supply, installation and connection of flush type switches, sockets, cover plates, switch plates & fixing fan regulator, lamp holder, ceiling rose etc.,

The point shall be complete with the branch wiring from the distribution board to the outlet point, through switch board, conduit with accessories, junction, pull/inspection boxes, control switch, socket, outlets boxes, ceiling roses, lamp holder, connector, extension cord wire, flexible conduits etc.

EARTHING:

SCOPE:

All the non-current carrying metal parts of electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main cable armour, switch gear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.

G.I.PIPE EARTH STATION :

G.I. pipe Earth shall be provide as per cpwd.

PLATE EARTH STATION :

Plate electrodes shall be made of G.I./copper (CU) plate of 6mm/3mm thick and 300 x 120mm size. The plate shall be buried vertically in ground at a depth of not less than 4.5 meters to the top of the plate, the plate being encased in charcoal to a thickness of 300 mm all round. It is preferable to bury the electrode to a depth where subsoil water is present. Earth leads to the electrode shall be laid in a heavy duty GI pipe and connected to the plate electrode with brass bolts, nuts and washers. A GI pipe of not less than 20 mm dia shall be clamped with bolts vertically to the plate and terminated in a wire meshed funnel. The funnel shall be enclosed in a masonry chamber of

450 mm x 450 mm dimensions. The chamber shall be provided with GI frame and CI inspection cover. The earth station shall also be provided with a suitable permanent identifications label tag. The earth electrode shall conform to IS:3043 latest edition.

EARTHING CONDUCTORS :

All earthing conductors shall be of high conductivity copper/or GI as specified and shall be protected against mechanical damage and corrosion. The connection of earth electrodes shall be strong secure and sound and shall be easily accessible. The earth conductors shall be rigidly fixed to the walls, cable trenches, cable tunnel, conduits and cables by using suitable clamps.

Main earth bus shall be taken from the main medium voltage panel to the earth electrodes. The number of electrodes required shall be arrived at taking into consideration the anticipated fault on the medium voltage net work.

Earthing conductors for equipment shall be run from the exposed metal surface of the equipment & connected to a suitable point on the sub main or main earthing bus. All switch boards, distribution boards and isolators disconnect switches shall be connected to the earth bus. Earthing conductors shall be terminated at the equipment using suit able lugs, bolts, washers and nuts.

All conduits cable armouring etc., shall be connected to the earth all along their run by earthing conductors of suitable cross sectional area. The electrical resistance of earthing conductors shall be low enough to permit the passage of fault current necessary to operate a fuse/ protective device or a circuit breaker and shall not exceed 2 Ohms.

LOCATION FOR EARTH ELECTRODE:

Normally an earth electrode shall not be situated less than 2 M from any building. Care shall be taken that excavation for earth electrode may not affect the column footings or foundation of the building. Further the location shall be such where the soil has reasonable chance of retainting moisture as far as possible. Entrances, pavements and roadways are definitely to be avoided for locating the earth electrode.

EARTHING SYSTEM :

Main earthing grid shall be of 50 x 6 GI strip laid in a grid formation. All other equipments shall be earthed to this strip. All panels, equipments and non current carrying conductor shall be earthed through the strip/wire of suitable size.

Earthing system shall be mechanically robust and the joints shall be capable of retaining low resistance even after subjection to fault currents.

Joints shall be tinned, soldered and/or double rivetted. All the joints shall be mechanically and electrically continuous and effective. Joints shall be protected against corrosion.

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SUMMARY

OF

ELECTRICAL WORKS

SL. NO.	DESCRIPTION	DSR 2016	NON SCHEDULED AMOUNT	TOTAL (DSR + Non-DSR)
	ELECTRICAL WORKS			
1	SUB HEAD-I: WIRING & SUBMAIN			
2	SUB HEAD -II: DISTRIBUTION BOARD			
3	Head III : LIGHTING FIXTURES			
4	SUB HEAD - IV : UPS WORK			
5	SUB HEAD- V -11 HT Syatem			
6	SUB HEAD- VI : Transformer			
7	SUB HEAD- VII -MV PANELS			
8	SUB HEAD-VIII : CABLE & END TERMINATIONS			
9	SUB HEAD-VII :EARTHING SYSTEM			
10	SUB HEAD-VIII : DG SET (SILENT TYPE)			
11	SUB HEAD-IX :EXTERNAL LIGHTING WORK			
	Total for Electrical Works			

NOTE

Please refer to BoQ for further details.

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
		INTERNAL ELECTRICAL WORK					
1.0	1	**SUB HEAD-I: WIRING & SUBMAIN**					
1.0	1.10	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class **PVC conduit, with modular switch**, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc as required.					
1.1	1.10.3	Group C	Point	20			
2.0		Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required.					
2.1	1.54.3	Group C	Point	15			
3.0	RA	Point wiring for DB controlled light points with 3 x 2.5 sq mm (P+N+E) FRLS PVC insulated 660/1100 volt grade stranded copper conductor wires in IS embossed black enamelled minimum 20mm dia 16 SWG PVC recessed and/or surface conduiting system including cost of providing saddles etc for surface conduiting and/or cost of cutting and filling chases for recessed conduiting in RCC slab/floor/walls complete as per specifications and as required (cost of MCB not included)	Point	40			
4.0	1.56	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providng and fixing 2 nos. 3 pin 5/6 A modular socket outlet and 2 nos. 5/6 A modular switch, connections etc. as required. (For light plugs to be used in non residential buildings).	Each	10			
5.0	1.31	Supplying and fixing suitable size **GI box with modular plate and cover** in front on surface or in recess, including providing and fixing **3 pin 5/6 amps modular socket outlet and 5/6 amps modular switch**, connection etc. as required. (For light plugs to be used in non residential buildings).	Each	15			
6.0	1.32	Supplying and fixing suitable size **GI box with modular plate** and cover in front on surface or in recess, including providing and fixing **6 pin 5/6 & 15/16 amps modular socket outlet and 15/16 amps modular switch**, connection etc. as required.	Each	35			
7.0	1.33	Supplying and fixing 3 pin, 5 amp ceiling rose on the existing junction box/ wooden block including connection etc as required.	Each	5			
8.0	1.14	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required.					
8.1	1.14.2	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	Metre	1500			
8.2	1.14.3	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	Metre	700			
8.3	1.14.4	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	Metre	50			
8.4	1.14.5	2 X 10 sq. mm + 1 X 6 sq. mm earth wire	Metre	15			
8.5	1.14.8	4 X 4 sq. mm + 2 X 4 sq. mm earth wire	Metre	5			
8.6	1.14.9	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	Metre	200			
8.7	1.14.10	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	Metre	50			
8.9	1.14.11	4 X 16 sq. mm + 2 X 6 sq. mm earth wire	Metre	50			
		TELEHONE AND DATA SYSTEM					
10	1.18	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.					
10.1	1.18.2	2 pair	Mtr.	800.00			
11	NS	Supplying and drawing PVC insulated, PVC sheathed multicore un armored taped telephone cables of 0.61 mm dia size in existing conduit pipe, of the following sizes.					
11.1	N-1	20 Pair	RM	25			

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		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
12	NS	Supplying and fixing of telephone distribution board (tag block) in hinged type MS box duly powder coated complete with bakelite sheet with terminal nation of incoming and outgoing telephone wire etc. complete as required.					
12.1	NS-2	20 Pair	Nos.	1			
13	1.24	Supplying and fiixing 2 pin Telephone modular socket & switch with modular plate,suitable size metal box and sheet cover including connection, testing, etc. as required.					
13.1	1.24.6	Telephone socket with shtter outlet	Each	15.00			
14	1.27	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required.					
14.1	1.27.1	1 or 2 Module (75mmX75mm)	EACH	15			
15	12.28	Supplying and fixing following Modular base & cover plate on existing modular metal boxes etc. as required.					
15.1	1.28.1	1 or 2 Module	EACH	15			
16	NS-3	Supplying and fixing 1 nos of CAT-6 , I/O with gang box, Face plate with G.I .box , RJ-45 Modem jack with shuter phenolic laminated sheet suitable size PVC/G.I. box as required. all complete as per instructions of Elec.Er. / Architect.	Each	15.00			
17.0	1.53.1	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required.	RM	300			
18.0	1.21	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.					
18.1	1.21.2	25 mm dia	RM	200			
18.2	1.21.3	32 mm dia	RM	50			
		Item as stated above	***Rs.***				
		Total of Sub-Head - I carried to summary sheet					

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		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
	2	**SUB HEAD -II: DISTRIBUTION BOARD**					
1.0	2.4	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/ Isolator)					
1.3	2.4.3	8 way (4 + 24), Double door	Each	3			
2.0	2.3	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)					
2.1	2.3.2	8 way , Double door	Each	1			
3.0	2.10	Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
3.1	2.10.1	Single pole	Each	80			
4.0	2.11	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	Each	1			
5.0	NS	Supplying and fixing following rating, four pole, 415 volts, MCB in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
5.1	NS-4	40 amps	Each	1			
5.2	NS-5	63 amps	Each	2			
6.0	2.14	Supplying and fixing following rating, double pole, (single phase and neutral), 240 volts, residual current circuit breaker (RCCB), having a sensitivity current upto 300 milliamperes in the existing MCB DB complete with connections, testing and commissioning etc. as required.					
6.1	2.14.2	40 amps	Each	3			
6.2	2.14.3	63 amps	Each	7			
		Total of Sub-Head - II Carried to summary sheet					

***QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDIT7IONS.

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
		Sub-Head - III: LIGHTING FIXTURES					
1		**Supply of Fixtures :**					
1.1	NS-5	Suppling and fixing single wall mounted 22watt LED type batten fitting compelet with electronic driver and LED Tube etc directly wall/ ceiling including conecttion with 1.5 SQMM FR PVC insulated copper conductor and earthing the body etc as requirede. havells ref. cat. ENDURALINEARNEOBS20WLED830SPCWH MAKE :HAVELLS/PHILIPS	Each	30.00			
1.8	NS-6	Supply and fixing of Baybrite Flare HighBay 80 W LED Next generation, energy saving, environment friendly & robust highbay LED with PDC housing suitable for ceiling (Surface/Suspended) mounting with system efficacy upto 150 lm/W. LED Fitting complete with electronic deiver with PVC Unsheathed copper leads from terminals to the fitting and as directed by Clinte. HAVELLS : BAYBRITEFLAREHB80WLED857PWBBOLT G MAKE :HAVELLS/PHILIPS	Each	9.00			
1.9		Supply and installation of regular /standard model A.C ceiling fanof 1200mm sweep including wiring the down rods of standard length (up to 30cm) with 1.5sq mm FR PVC insulated copper conductor etc. as required .havells PACER WHITE					
a)	NS-7	1200 mm sweep	Each	10.00			
1.10	1.25	Supplying and fixing two module stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	Each	10.00			
1.11	NS-8	Supply and installation of 300mm, 230V A.C exhaust fan in the existing opening including making good the damage connection testing commissioning etc as required Havells : Ventil Air - DB NEO	Each	2.00			
2		**Erection of Fixtures:**					
1.1	**1.35**	Installation, testing and commissioning of wall bracket /ceiling fittings of all sizes and shapes containing upto two GLS/CFL/ LED lamps per fitting, complete with all accessories including connections etc. as required.	Each	39.00			
1.2	**1.45**	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable, including providing and fixing phenolic laminated sheet cover on the fan box etc. as required.	Each	10.00			
1.3	**1.50**	Installation of exhaust fan in the existing opening, including making good the damage, connection, testing, commissioning etc. as required.					
1.3.1	**1.50.1**	Upto 450 mm sweep	Each	5.00			
		Item as stated above	***Rs.***				

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		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
		SUB HEAD - IV : UPS WORK					
2.1	**PLINTH AREA RATES FOR SPECIALISED E&M WORKS DSR-4**	**Supplying, installation, testing and commissioning of online 1 phase UPS System with 30 minutes back up including batteries, interconnecting cables, battery racks etc.**	PER KVA	5.00			
		TOTAL OF UPS					
		SUB HEAD-V 11 HT Syatem					
		11kv HT PANEL					
		630A 11 kV vaccum circuit breakers					
		Supplying, installation, testing & commissioning of H.V. air insulated distribution switchgear **extendable type H.T. Board** suitable for indoor installation for use on 11 KV 50 Hz earthed system having a symmetrical breaking capacity of 350 MVA at 11 KV comprising of 630A 11 kV vaccum circuit breakers. Cable box with single compression brass glands suitable size to receive 11 KV XPLE cable of 3 core 70 sq.mm. The panel shall be equipped with following accessories as per SLD and specification compete as required.					

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		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
		INCOMINGING PANELS - 1 Nos. EACH SHALL COMPRISING OF:					
		1No. -Metal Clad housing with having 630A Vacumm circuit breaker with Manual & Electric operated mechanism (spring charged motor - 230V AC)					
		1Set- Tripping coil & closing Coil 24V DC					
		1 - Set of isolating plug and receptacle					
		1 - Set of Automatic safety shutter					
		1- Set of breaker control switch (TNC)					
		1 -Set of dual core CT's as follows:					
		Core I - 20/5-5A class 5P-10 (15 VA)					
		Core II - 20/5-5A class -1 (15 VA)					
		1set of 11KV /v3 / 110/v 3 Volt, 100 VA burden & accuracy class 1, 3 nos. single phase construction, dry type cast resin PT					
		1 - No. Ammeter(0-120A) with selector switch (Built-in)					
		1 - KW, KVA, KWH ,PF, HZ & KVAH Meter					
		1 - Set of ON/OFF/Trip/ Spring Charged & Trip circuit healthy and phase indicating lamps.					
		1 No.-H.T. Cable joint box suitable for 2R -3C x 70 sq.mm aluminium conductor XLPE cable, 11 KV (E)					
		1-set of IDMTL relay with 3 elements of O/C protection(50%-200%), instantaneous O/C protection (200%-800%) & 1 element of E/F protection (10%-40%).					
		1 no. U/V & O/V relay					
		1 no. Anti Pumping Relay					
		1 no. Trip Circuit supervision relay.					
		1 no. Negative phase sequence protection relay.					
		1 no. Master Trip relay.					
	NS-9	1 no. 12 window Annunciation system for alarm & Trip status of relays, HT Breakers complete with acknowledgement & Reset Button.	Set	1			
1	**NS**	Supplying of following Aluminum conductor, XLPE insulated & armoured and over all PVC sheathed, 11 KV (E) grade earthed cable as per technical specifications					
a.	NS-10	3C x 70 sq.mm. XLPE insulated Al. Ar. Cable	RM	100			
2	**DSR-18**	**11 kv HT Cable Laying & Termination**					
1	10.1	Supplying and making indoor cable end jointing with cast resin compound, including lugs and other jointing materials, for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required :					

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		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
3		Indoor Type					
a)	10.1.1	70 sq. mm	Each	2			
3	DSR-18	Supplying and making outdoor cable end jointing with cast resin compound, including lugs and other jointing materials, for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required :					
2.1		Outdoor Type					
1)	10.2.1	70 sq. mm	Each	4			
		Laying of Cables					
4	DSR-8.4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing masonry open duct as required.					
a)	8.4.1	Upto 120 sq. mm	Metre	100			
		TOTAL OF HT Power Cable WORK					
		SUB HEAD-VI Transformer					
		Transformer - 250 KVA 11/0.433kva Out Door Olil Type					
1	**NS-11**	Supplying/Receiving, Installation/Erection, Testing and Commissioning of 250 KVA ONAN, Copper wound 11/0.433 KV, 50 C/S, Delta star connected, Dyn11 vector group, Oil immersed Outdoor transformer with On Load circuit Tap changer for Voltage regulation from -10% to +15% in steps of 1.25% on HV side complete with AVR and RTCC panel, including Bucholtz relay, MOG, Oil & Winding temperature alarm and trip contacts with wiring upto marshalling box,and all standard accessories as required, complete with Cable End box suitable for 3RX3C x 70 sq.mm. 11 KV(UE) XLPE insulated Al. Ar. Cable at HT side and XLPE insulated Al. Busduct for LT side, including S/F of M.S. channel of size 100 x 50 x 6mm for foundation support for transformer,including Drying/filteration of oil of transformer and OLTC Enclousere.Connection with Tap Changing Mechanisem and RTCC Panel etc. as per specification and drawing.					
		Supply Rate for Transformer as described above	SET	1			

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
		SUB HEAD- VII - MV PANELS					
1		**PCC PANEL**					
	NS	Design, Fabrication, Supply, Erection,Testing and commisioning of Powder coated Main Distribution Panel fabricated out of 14 guage CRCA sheet steel in cubical, compartmentallised, free standing floor /wall mounted, dust and vermin proof, with reinforcement of suitable size angle iron, channel, T -iron or flats as required. Cable gland plates shall be provided on top as well as bottom of the panels. Panels shall be treated with all anti-corrosive process before painting as per specification. Panels shall be suitable for 415V, 3-Phase, Four wire, 50 Hz supply complete with earth bus and lifting hooks as required in case of large panels.Approval shall be taken for each panel before fabrication. (All hardwares like nuts and bolts used shall be Galvanized and Zinc passivated)					
		MAIN L.T. Panel					
		INCOMER FROM TRANSFORMERS(1Nos. 250 KVA Each)					
		Incomer from each transformer shall be provided with the following:					
		1 Sets of 630A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		IDMTL Protection for S/C, O/C & E/f releases.					
		U/V & O/V protection					
		Trip circuit supervision relay					
		Master trip relay					
		The ACB shall be complete with 3nos. 600A/5A, 15VA, 5P10 CTs for protection .					
		METERING & INDICATION					
		1 set of phase indicating lamps					
		1 set of Voltmeter (0-500V) with VSS with 3 nos. 2A SP MCBs each					
		1 Nos. Load Analyser cum digital Multifunction Meter with 3 nos. 600/5A, CL-1 CTs, as required.					
		1 Set of Breaker ON-OFF-TRIP, Spring charged indication Lamps					
		1 no. of 600/5A, 15 VA, class-1 CTs for APFC relay dule					
		1 No. 400V AC/12V DC, 100VA SMPS (Rectifiers) with TP MCB of suitable rating & 2nos 6way terminal strip .					
		INCOMER FROM 250KVA DG SET (1 nos.)					
		Each Incomer from DG SET shall be provided with the following:					
		1 Sets of 630A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		IDMTL Protection for S/C, O/C & E/f releases.					
		U/V & O/V protection					
		Trip circuit supervision relay					
		Master trip relay					
		Reverse power Protection.					
		The ACB shall be complete with 3nos. 600A/5A, 15VA, 5P10 CTs for protection.					
		Each Incomer from DG Set I shall be provided with the following:					

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
		METERING & INDICATION					
		1 sets of phase indicating lamps					
		1 sets of Voltmeter (0-500V) with VSS each with 3 nos. 2A SP MCBs each					
		1 Nos. digital Multifunction Meter with 3 nos. 600/5A, CL-1 CTs, as required					
		1 Sets of Breaker ON-OFF-TRIP, Spring charged indication Lamps					
		BUS BAR:-					
		1 Sets of 800 A, TPN Aluminum bus bars with colour coded sleeves.					
		INTERLOCKING.					
		Incomers from Transformer and Incomers from D.Gs. shall be electrically interlocked.					
		OUTGOINGS					
		2 Sets of 400A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		2 Sets of 160A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		2 Sets of 100A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		7 Nos.63 A FP MCCB					
		11 Nos.40 A FP MCCB					
		CAPACITOR PANEL65 kvar					
		Metering & Indication					
		1 set of phase indicating lamps					
		1 No. (0-500V) Digital Voltmeter with Built-in VSS with 3 nos. 6A SP MCB					
		1No. (0-100A) Digital Ammeter with ASS and 3 nos. 100/5A, CL 0.5,10VA CTs'					
		1 No. 4 step duel sence APFCR relay					
		1 No. Selector switch for auto-off-manual.					
		BUS-BAR					
		1 Set of 160A TP Aluminium Bus Bar with colour coded PVC Sleeves (Heat Shrinkable sleeve)					
		OUTGOINGS					
		2 Sets of 63 A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 45 A TP Power contactor (AC-3 duty)					
		1 Sets of 32 A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 32 A TP Power contactor (AC-3 duty)					
		1 Sets of 25 A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 16 A TP Power contactor (AC-3 duty)					
		2 Nos. 25 KVAR capacitors MPP TYPE NORMAL DUTY					
		1 Nos. 10 KVAR capacitors MPP TYPE NORMAL DUTY					
		1 Nos. 5 KVAR capacitors MPP TYPE NORMAL DUTY					
		4 Sets self Illuminated Red-Green (ON-OFF) and push buttons.					

***QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
	NS-12	**Supply of LT Panel as Described above**	Set	1.00			
		Note: The vendor shall submit GA drawing for approval to consultant/client.					
		UTILITY PANEL					
	NS	Fabrication, supply, installation, testing and commissionings of cubicle type floorMounted Main Distribution Board panel made out of 16mm thick CRCA sheet including connection, inter-connection alongwith 4 stsrip aluminium bus bar as per CP WD specifications, (Part IV - Sub-station) and IS: 8623 comprising of followings panel mounting switchgears etc. as required. As per spcification.					
		Incoming					
		1 Nos.400 Amps FP MCCB With thermal magenetic release for O/C,& S/C Protection.					
		Protection Istrument					
		1 Set of (0-400Amps) CT operated of Multi Functional three					
		One (1) Set of Phase Indication & ON/OFF Lamp with control					
		Busbar					
		500 Amps TP&N aluminum conductor bus bar (BPTM type Heat-					
		OUTGOING					
		2 Sets of 160A TP+N MCCB 25kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		4 Sets of 100A TP+N MCCB 25kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		6 Sets of 63A TP+N MCCB 25kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
		2 Sets of 40A TP+N MCCB 25kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 110A TP Power contactor (AC-3 duty)					
	NS-13	Forteen (14) Set of LED ON Indication Lamp with 6 A sp MCB.	Set	1			
		Note: The vendor shall submit GA drawing for approval to consultant/client.					
		Total of Sub-Head - VII carried to summary sheet					

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
	6	**SUB HEAD-VIII : CABLE & END TERMINATIONS**					
		Supply of MV cable					
1.0	NS	Supply, following sizes of PVC sheathed PVC/XLPE insulated Aluminium conductor multicore control armoured cable of 1.1 KV grade.					
1.1	NS-14	3.5C- 300 sq mm Aluminium	Metre	25			
1.2	NS-15	3.5C- 185 sq mm Aluminium	Metre	250			
1.3	NS-16	3.5C- 35 sq mm Aluminium	Metre	100			
1.5	NS-17	4C- 25 sq mm Aluminium	Metre	100			
1.6	NS-18	4C- 16 sq mm Aluminium	Metre	150			
1.7	NS-19	4C- 10 sq mm Aluminium	Metre	150			
1.8	NS-20	4C- 6 sq mm Aluminium	Metre	550			
2.0	9.1	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.					
2.1	9.1.29	3.5C- 240 sq mm Aluminium	Each	2			
2.2	9.1.27	3.5C- 185 sq mm Aluminium	Each	6			
2.3	9.1.23	3.5C- 35 sq mm Aluminium	Each	2			
2.4	9.1.34	4C- 25 sq mm Aluminium	Each	6			
2.5	9.1.33	4C- 16 sq mm Aluminium	Each	8			
2.6	9.1.32	4C- 10 sq mm Aluminium	Each	18			
3.0	7.1	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.					
3.1	7.1.1	Upto 35 sq. mm	Metre	950			
3.2	7.1.2	Above 35 sq. mm and upto 95 sq. mm	Metre	100			
3.3	7.1.4	Above 185 sq. mm and upto 400 sq. mm	Metre	275			
		Perforated trays					
4.1		Supplying and installing following size of perforated painted with powder coating M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required.					
4.1.1	4.1.6	450 mm width X 50 mm depth X 2.0 mm thickness	Mtr	100			
4.1.2	4.1.2	150 mm width X 50 mm depth X 1.6 mm thickness	Mtr	250			
		Total of Sub-Head - VI Carried to summary sheet					

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		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
8		**SUB HEAD-VII :EARTHING SYSTEM**					
1	5.4	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required.	Set	10			
2	5.11	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	RM	115			
3	5.15	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required	RM	350			
4	5.6	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required.	Set	4.00			
5	5.10	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe from earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	RM	50			
6	5.14	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	RM	100			
		Total of Sub-Head - VII carried to summary sheet					

		BILL OF QUNATITIES					
S. No.	DSR 2018 Item No.	Description	Unit	Qty.	Rate	Amount in Rs. (Schedule Items)	Amount in Rs. (Non- Schedule Items)
9		**SUB HEAD-VIII DG SET (SILENT TYPE)**					
		250 KVA Silent D.G. Set :-					
		Supply, fitting, errection and commissioning of 250 KVA D.G. Set, 415 Volts, 3 Ph. Silent Diesel Generator Set confirming to IS:10001/10002 AC supply complete with engine (1500 RPM) and alternator DG Set controller confiring to IS:13364 with accessories including residential type silencer and fuel service tank 990 litres capacity, battery, nattery leads, battery charger with all accessories, including MCCB of suitable rating & standard set of tools and anti-vibration mounting pads, etc. The power command controller compactable with BMS, PC & PLC compelte as required, remote mointoring and data logging with digital voltage regulator through inbuilt AVR, digital governing including protection complete as required. Providing & installing the complete control cables between DG Set & Main LT Panel to make system autiomatic complete as required. Rate shall be inclusive of all items required for D.G. Sets exhaust system including M.S. pipes, insulation, M.S. structure & accessories etc. and shall be compiled to ECBC-2007 norms, along with the following accessories:- (Make:-Kirloskar (GREEN) / Sterling & Wilson / Jakson)/SUPERNOVA /TATA					
		Supply of acoustic enclosure for 250 KVA CPCB approved Acoustic enclosure with 80 mm MS base plate, 2 mm CRCA sheet, 50 mm thick foam / 100 mm Rock Wool Insulation, 14 surface tank treatment, dully powder coated and painted with Briliant Blue colour with integrate Fuel Tank, services door, louvers (Fresh Air / Radiator), 1020 dia residential type Silencer, complete with following accessories :-					
		a) Fuel Tank.					
		b) Batteries, battery leads and battery charger.					
		c) Residential Silencers.					
		d) First fill of lube oil.					
		e) A.M.F. Panel.					
		f) AVM Pads.					
		In above supply item following work are also included :- i) Installation, fitting, fixing, testing and commissioning of the same. ii)Civil part for commissioning of D.G. Set. iii) Installation of Exhaust system for D.G. Set shall be as per Central & State Pollution Board Norms along with iron structure i.e. 5 mtr. above the height of nearest building.If this will be in the scope of the contractor then charges shall be extra and that will be the actual. iv) Test run for D.G. Sets without load and with load (part wise).					
		In above supply item following work are also included Control Breaker AMF Panel for having all type of meters (Voltmeter, Ammeter, KW/m, Hz/m) with suitable arrangement for 2 Runs 185 Sq mm 3.5 Core Al. Ar. Cable etc as required. Note:- Technical specification of above 500 KVA Silent D.G. Set shall be provided at the time of work order.					
1	NS-21	**Total Cost of 250 KVA SILENT DG SET**	Set	1			

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
10		**SUB HEAD-IX EXTERNAL LIGHTING WORK**					
1		**FEEDER PILLAR-1**					
		Design, manufacturer, supply, testing and commissioning of approx size 1200 mm heightx1000mm wide x 450mm deep of 2.5mm thick sheet metal enclosure, powder coated, weather proof, double door type feeder pillar with godown lock and padlock complete with interconnection with copper wires, LED indicating lights, providing holes for the glands. The base frame shall have angle iron of 50mm x 50mm x6mm of size 1000mm x 450mm with 600mm long legs of MS angle and coverage of underground cable under feeder pillar with 2.5 mm thick sheet, 450mm in width all round the base frame including grouting the feeder pillar in 1:4:8 cement concrete complete as required. Feeder Pillar shall be suitable for 415V, 3-Phase, Four wire, 50 Hz supply complete with earth bus and lifting hooks as required. Approval shall be taken for each panel before fabrication. (All hardwares like nuts and bolts used shall be Galvanized and Zinc passivated)					
	a	**Feeder Pillar-1**					
	i	**INCOMER**					
	B	1No. 63 A TPN MCCB					
	i)	**Protection Istrument**					
	ii)	One (1) Nos. (0-500V) 96 x 96 Sq.mm voltmeter with control Fuse & selector switch.					
	iii)	1 Set of (0-60 Amps) 96 x 96mm CT operated Ammeter with 3 way selector switch and 60 /5A, CL-1, 10VA CT.					
	ii	One (1) Set of Phase Indication & ON/OFF Lamp with 2A Fuse.					
		1 Nos.TIMER suitable for 24Hrs. Setting with Auto/Manual Selector switch					
	c	1 No. 25A TP CONTRACTOR					
	i	**BUS-BAR**					
	d	1 Set of 100A TPN Aluminium Bus Bar with colour coded PVC Sleeves (Heat Shrinkable sleeve)					
	i	**OUTGOINGS**					
		8 No. 20 A DP MCB					
	NS-22	**Feeder pillar-1 as described above**	No.	1			
	1	All live accessible parts shall be shrouded and all equipment shall be finger touch proof. The busbar insulation shall be with heat shrinkable sleeves. SMC/DMC shrouds and busbar supports shall be used. Padlocking facility shall be provided.					
	2	The feeder pillar shall be complete with all interconnections, risers, internal wiring, labels etc.					
2	14.13	Providing, laying and fixing following dia G.I. pipe (medium class) in ground complete with G.I. fittings including trenching (75 cm deep)and re-filling etc as required					
2.1.1	14.13.1	50 mm dia	EACH	4			
2.3	11.6	Supplying and embedding following dia G.I. pipe (medium class) in pole collar/ foundation (during casting) for cable entry including bending the pipe to the required shape complete as required.					
2.3.1	11.6.1	32 mm dia.	Meter	18			
3		**Light Fixture**					

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		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
3.1	NS-23	Supplying and fixing street light with high power LED of 1 to 3 W each assembled on single MCPCB, system lumens output with efficacy>90 lm/W. luminiare having color temp 6500K & 50000 burning hrs life with minimum @ L 70, The colour rendering index of LED light should be more than 70. Luminiare comprises of driver, PF 0.95 & surge protection 3KV. Housing made of pressure die cast aluminium with heat resistant flat glass / Lens type, IP65 protection. Submission LM 80-08 Form LED Source Manufacturer & LM79-08 / IS16106 from NABL approved lab. Manufacturer manadatory i/c 50mm.dia G.I. Pipe bracket upto 2 mtr. long in required angle/shape, connection lead, testing etc to complete the job. 2 Yrs Guarantee certificate from manufacturer. Havells ref cat : ENDURAPEARLPLUSSL60WLED757SASYTOPC approved as equivalent.	Each	18.00			
3.2	NS-24	Supplying, fixing & testing of approved Supplying and fixing integral post top lantern LED fitting comprises of copper dust finish cast aluminium spigot and spun aluminium canopy fixed with opal polycarbonate, pipe arrangement for vertical mounting, open construction driver and accessories are wired up to terminal block. LED of 1 to 3 W each assembled on single MCPCB, having color temp 6500K & having 50000 burning hrs life with minimum @ L 70, system lumen output should be minimum with efficacy>80lm/W. LED driver PF 0.95 & surge protection 2KV. The colour rendering index of LED light should be more than 70. Submission LM 80-08 Form LED Source Manufacturer & LM79-08 / IS16106 from NABL approved lab. Manufacturer manadatory. i/c connection wire, testing etc. to complete the job. 2 Yrs Guarantee certificate from manufacturer. Havells ref cat : CORALPT25WLED757PSYMTOPC approved as equivalent.	Each	4.00			

		BILL OF QUNATITIES					
S. No.	**DSR 2018 Item No.**	**Description**	**Unit**	**Qty.**	**Rate**	**Amount in Rs. (Schedule Items)**	**Amount in Rs. (Non- Schedule Items)**
4		**CABLE**					
4.1		Supply, laying, testing and commissioning of 1100 Volt grade XLPE insulated aluminium conductor armoured cables including the cost of providing required gap between adjacent cables (minimum one cable dia.) and including the cost of providing identification tags etc. complete as per specification, as required.					
4.1.1	NS-25	3 core, 10 sq. mm XLPE/PVC insulated PVC sheathed (Heavy duty) armoured electric	RM	450			
		Cable termination :					
4.2	DSR-9.1	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.					
4.2.1	DSR-	3X 10 sq. mm (19mm)	Nos.	36			
4.3	1.17	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.					
4.3.1	1.17.12	3 x 2.5 sq. mm	RM	150			
		Notes :					
1		The cable quantities given are approximate and to cover various sizes. The contractor shall measure the cables required and procurement order shall be placed accordingly. The quantities shall be confirmed before start of work.					
2		Single Compression glands to be used for internal area, while double compression cable glands to be used for outdoor installation.					
4.4	7.1	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.					
4.4.1	7.1.1	Upto 35 sq. mm	RM	450.00			
		Hume Pipe:					
4.5	14.14	Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc as required					
4.5.1	14.14.1	100 mm dia	RM	15			
		EARTHING SYSTEM					
5.1	5.2	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required	Set	2			
5.2	5.11	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	RM	10			
		TOTAL					

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NAFED

LIST OF

APPROVED MAKES

Sr. No.	Description	Approved Makes
1.	Low Tension, 415 Volts AC Air Circuit Breaker, 3/4 Pole 50 Hz. 50 KA-STR.	SCHNEIDER-MASTERPACT. SIEMENS-3WL ABB-E-MAX-SACE, L & T-U-POWER-SR71
2.	Low Tension, Molded Case Circuit Breaker, 415 Volts AC, 3 Phase 50 Hz., 50 KA/35 KA-STR. Ics=Icu & Microprocessor	SCHNIDER-COMPACT SIEMENS-SENTRON-3VL ABB-T-MAX-SACE L & T – D SINE
3.	LED Type Indicating Lamps with Color LED.	SCHNIDER/L & T/ SIEMENS
4.	Selector Switches for Ammeter/Voltmeter.	SCHNIDER/L & T/ SIEMENS
5.	Meters, Analog type. for Ammeters, Voltmeters, PF meters, Frequency Meters.	IMP/ RISHABH
6.	Energy Meters.	SECURE/ L & T/CONZERV
7.	Relays.	SCHNIDER/ ABB/SIEMENS
8.	FRLS Panel wires, in color in 660/1100 Volts grade	HAVELLS/ R.R. KABEL/ POLYCAB
9.	Lugs, Crimping type, tinned copper heavy duty only.	JENSON LAPP

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

Sr. No.	Description	Approved Makes
10.	Push Button Stations type, in different colour codes.	SCHNIDER/ L & T /SIEMENS/
11.	Terminal Blocks, Clip on type.	WAGO/ LAPP
12.	HT/LT Panel	SPE ELECTROTECH PVT. LTD/ SUDHIR/STERLING AND WILSON
13.	Starters/Contactor/ Timers.	TELEMECANIQUE / L & T SIEMENS / ABB
14.	Miniature Circuit Breaker of 10 KA Breaking Capacity and Boards.	SCHNIDER/ LEGRAND L & T/ABB
15.	CTs - 660 Volts grade ABS CASINGS	RECO/KAPPA INDCOIL
16.	Load Managers.	CONZERV / L & T / ENERCON
17.	HRC Control fuses with Bakelite/type Moulded fuse holders.	ABB/BUSSMAN/ SIEMENS/L & T
18.	Push Button Stations type, in different colour codes.	TECHNIK/MOELLER/ SIEMENS/ VAISHNAV
19.	Terminal Blocks, Clipon type.	ELMEX/WAGO/ CONNECTWELL
20.	BATTERIES	EXIDE / CUMMINS
22.	PLC	ROCKWELL AUTOMATION / L&T /SIEMENS
23.	Transformer	SCHNIDER/ ABB/ GE

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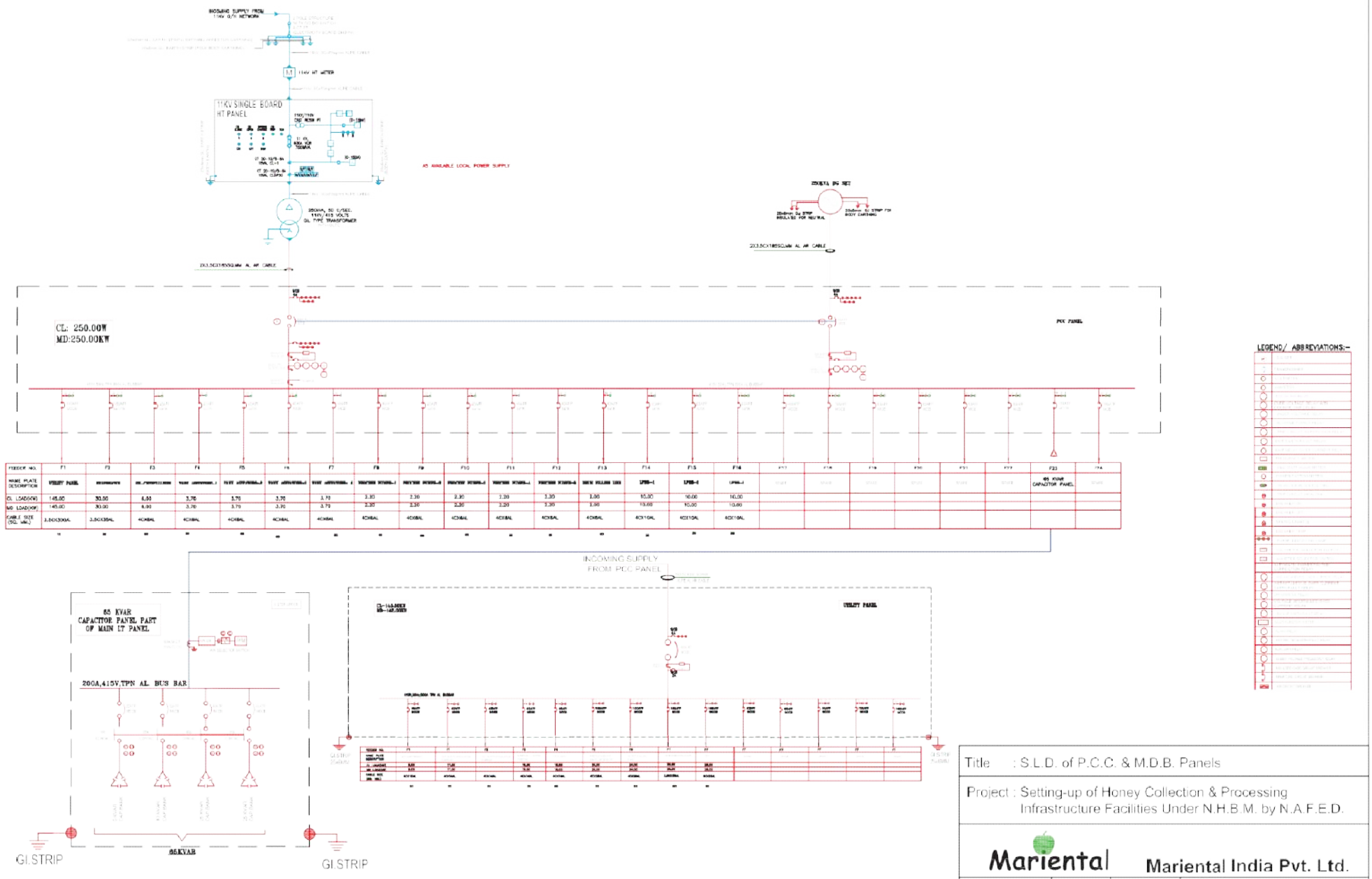
Sr. No.	Description	Approved Makes
24.	HT POWER CABLE	HAVELLS/POLYCAB/FINOLEX/RGP
25.	LT POWER /CONTROL CABLE	HAVELLS/POLYCAB/FINOLEX/RGP
26.	TELEPHONE AND DATA CABLE	HAVELLS/POLYCAB/FINOLEX
26.	Lighting Fixture	WIPRO/HAVELLS/BAJAJ/Surya
27.	Modular Switch	ANCHOR/CRABTREE/MK
28.	Ceiling /Exhaust/Wall Fan	HAVELLS/CROPTON/BAJAJ
29.	Battery Charger	KAY3ESS
30.	Any other Item.	SAMPLE FOR APPROVAL OF THE CONSULTANTS

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

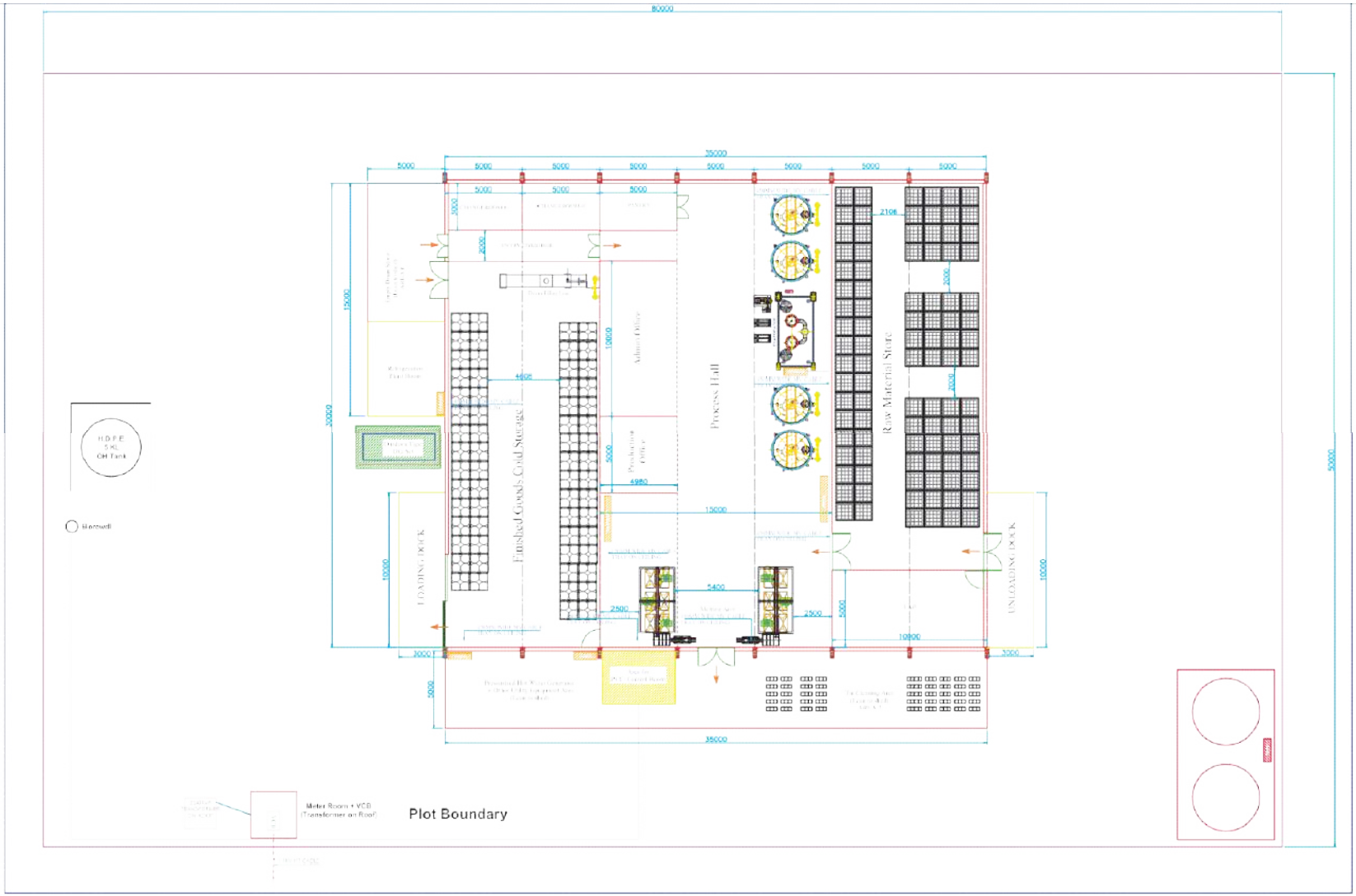


FEEDER NO.	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24
NAME PLATE DESCRIPTION	UTILITY PANEL													UPS-1	UPS-2	UPS-3							65 KVAR CAPACITOR PANEL	
CL LOAD(KW)	145.00	30.00	6.00	3.70	3.70	3.70	3.70	2.30	2.30	2.30	2.30	2.30	2.30	15.00	10.00	10.00								
MD LOAD(KW)	145.00	30.00	6.00	3.70	3.70	3.70	3.70	2.30	2.30	2.30	2.30	2.30	2.30	15.00	10.00	10.00								
CABLE SIZE (SQ. MM.)	3.5CX300AL	3.5CX35AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX6AL	4CX10AL	4CX10AL	4CX10AL								

Title	: S.L.D. of P.C.C. & M.D.B. Panels
Project	: Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd.

DRAWN BY	V. Kumar	17/07/2021	CLIENT: National Agricultural Cooperative Marketing Federation Ltd. (NAFED), New Delhi	
CHECKED BY	TS. Maurya	18/07/2021		
APPROVED BY	V. Kaul	18/07/2021	SCALE: NTS	REV.
DRG. NO: E - 2106-10 - TENDER E17- 01				0



CABLE ROUTE LAYOUT PLAN

Title	: Cable Route Layout Plan
Project	: Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd.

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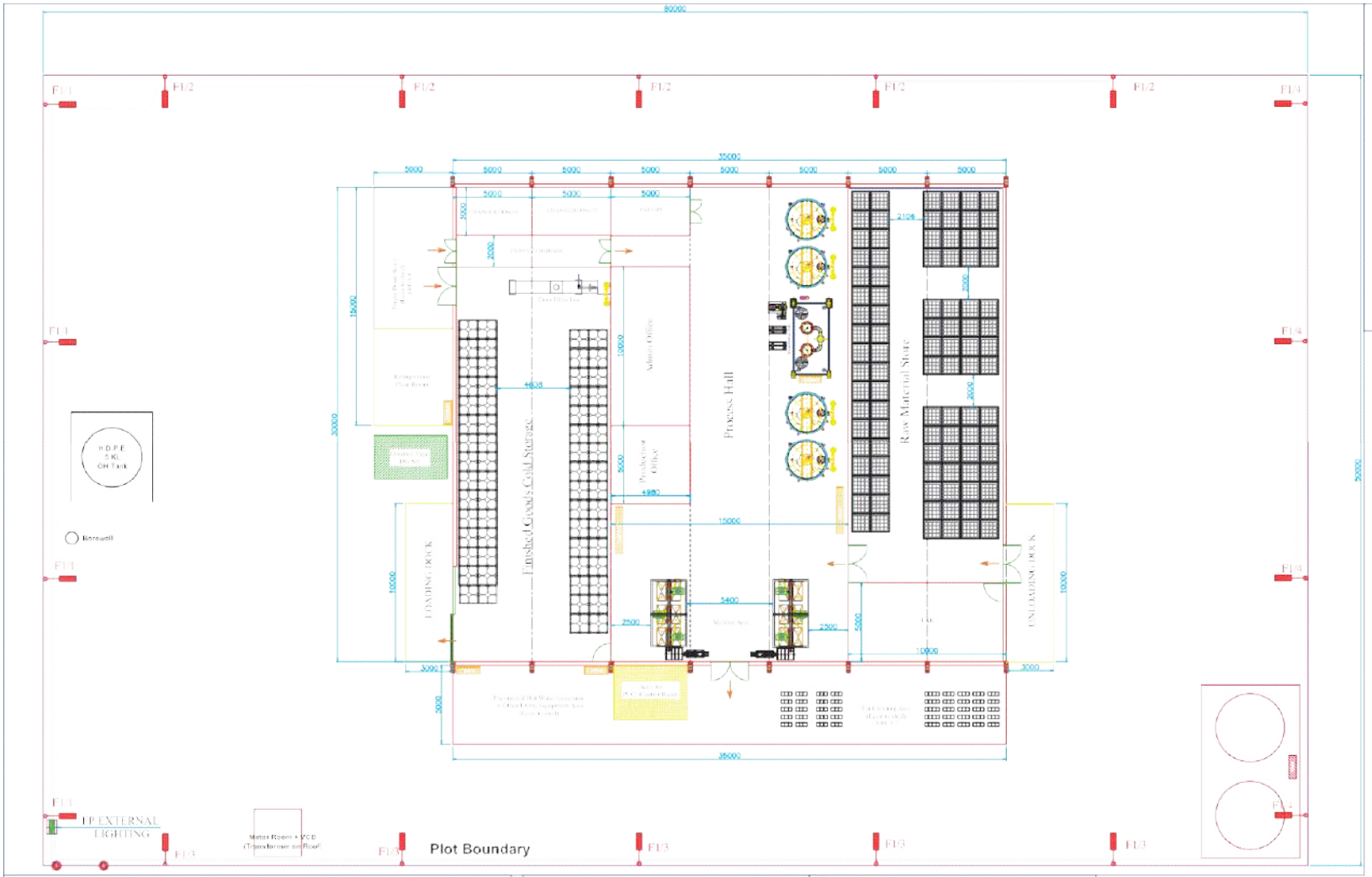
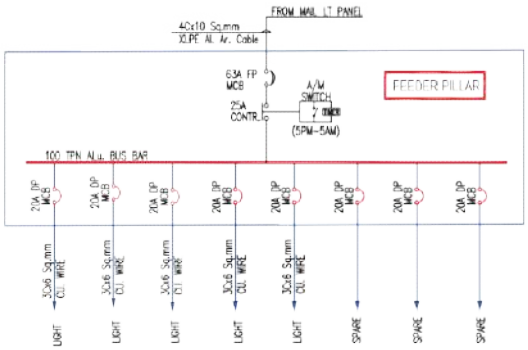
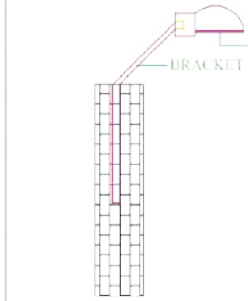
CHECKED BY				
APPROVED BY			SCALE: NTS	REV
DRG. NO: E - 2106-10 - TENDER F17- 02				0





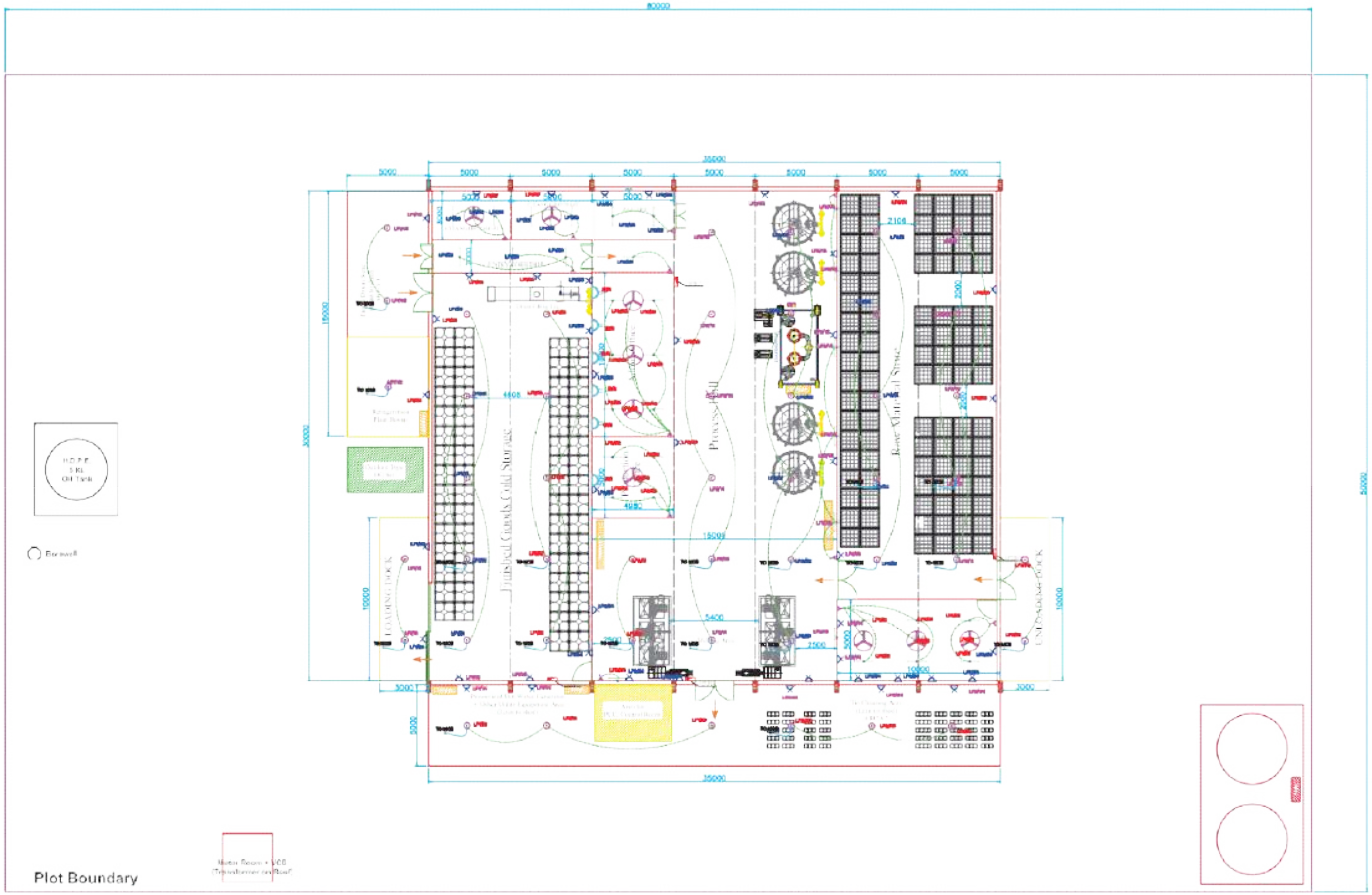


Title : External Light Plan

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd

DRAWN BY		17/07/2023	CLIENT: National Agriculture Cooperative Marketing Federation Ltd.(NAFED), New Delhi	
CHECKED BY	T.S. Bisht	18/07/2023		
APPROVED BY		18/07/2023	SCALE: NTS	REV.
DRG. NO: E - 2108-10 - TENDER F17- M				0

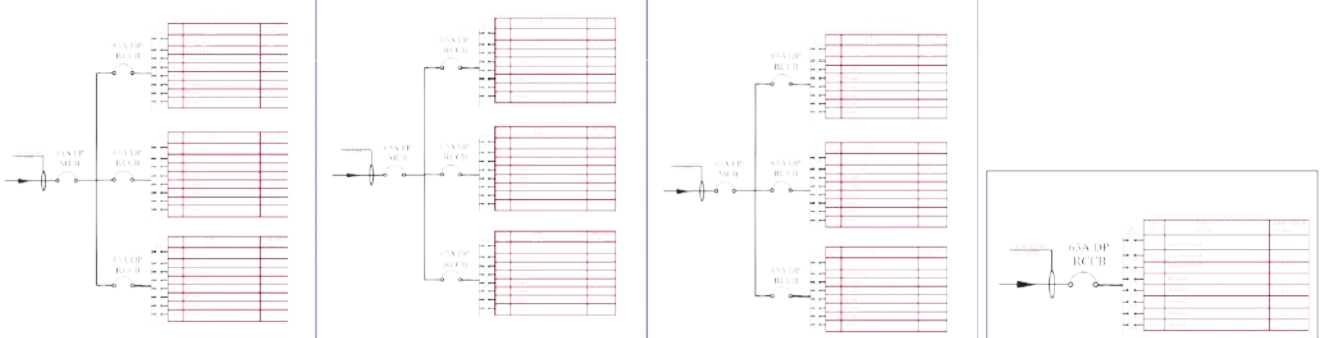


25MMø PVC CONDUIT FOR LIGHT

25MMø PVC CONDUIT FOR POWER

LEGEND		HEIGHT(MM)
	16A SOCKET WITH SWITCH	300 FFL
	32A INDUSTRIAL SOCKET WITH SWITCH	300 FFL
	1SET UPS POWER (1NO. 6A SOCKET WITH SWITCH) 1SET RAW POWER (1NO. 6A SOCKET WITH SWITCH) + 1NO DATA + 1NO TELEPHONE	500 FFL
	DISTRIBUTION BOARD	1800(TOP)

	LEGEND	HEIGHT(MM)
	ONE WAY SWITCH BOARD	1050 FFL
	LED SURFACE LIGHT FIXTURES	ON CEILING
	1X10 SURFACE LIGHT	ON CEILING
	1X10 SURFACE LIGHT(EMERGENCY CONTROL)	ON CEILING
	1X36 RECESS LIGHT	ON FALSE CEILING
	1X36 RECESS LIGHT (EMERGENCY CONTROL)	ON FALSE CEILING
	MIRROR LIGHT	AS PER DETAIL
	20 W. LED TUBE LIGHT (EMERGENCY CONTROL)	2100MM
	WALL FAN	AS PER DETAIL
	CEILING FAN(1200 MM SWEEP)	ON CEILING
	DISTRIBUTION BOARD	1800(TOP)



Title : Electrical Plan

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental India Pvt. Ltd

DRAWN BY	[illegible]	17/07/2021	CLIENT: [illegible]
CHECKED BY	[illegible]	18/07/2021	
APPROVED BY	[illegible]	18/07/2021	SCALE: NTS

REV. 0

DRG. NO: E - 2106-10 - TENDER E17- 04

NAFED

TENDER SPECIFICATIONS

For

i. **P.U.F. SANDWICH PANELS**
ii. **H.V.A.C. SYSTEM**
iii. **M.H.E. & PLASTIC PALLETS**

ON TURNKEY BASIS
FOR
ESTABLISHING A COLD STORAGE
(WITHIN THE MAIN BUILDING)
OF A
HONEY PROCESSING UNIT

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

NAFED

P.U.F. SANDWICH PANELS

TECHNICAL SPECIFICATIONS SHEET
FOR
P.U.F. SANDWICH PANELS

1. INTRODUCTION

To prevent spoiling of processed and packed honey, it has been proposed to construct a cold storage and maintain the temperature of stored honey at around 14 deg. C. The insulation of cold storage shall be achieved by installation of 80 mm thickness PUF sandwich panels.

2. SCOPE OF WORK

The contractor is required to design, manufacture, supply and install the 80 mm thickness PUF sandwich panels as per the requirements mentioned in this document, for creation of the proposed cold storage within the main building of the honey processing unit. The size of the cold storage shall be 25 (L) by 10 (W) meters and a clear height (H) of 7.5 meters. The contract shall be on a turnkey basis including of all standard accessories, sealing arrangements and three numbers of sliding doors.

3. SCHEDULE OF QUANTITIES

Following is the indicative list of materials as may be required in order to successfully complete the work but it should not be considered to be exhaustive as some factors depend on the exact site conditions.

S. No.	Item Description	Unit	Quantity
i.	80 mm Thick PUF Insulated Continuous Sandwich Panels Both side PPGI 0.45 mm TCT with Tongue & Groove arrangement. (For Wall), PUF Density: 40± 2 Kg/ cu. m	Sq. m	525

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

ii.	80 mm Thick PUF Insulated Continuous Sandwich Panels Both side PPGI 0.45 mm TCT with Tongue & Groove arrangement. (For Ceiling), PUF Density: 40± 2 Kg/ cu. m	Sq. m	250
iii.	80 mm Thick PUF Insulated - Manual Sliding Door of Size 3.0 m x 2.0 m	No.	3
iv.	Supply of Channel, Angles, Flashings, Suspension Rod etc. and other complimentary and auxiliary components to be used for erection	Lot	1

4. DETAILED SPECIFICATIONS

Refer to pages below:

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

PUF Panels and Specification

CORE : POLYURETHENE FORM (PUF)	
ITEM	**OPTIONS**
Panel length	Any length from 1500mm to 15000mm
Panel Width	1160 MM
Panel Thickness	42 mm – 150mm
Metal facial*on either side of the panel	Pre-Coated Galvanized Steel - (PCGI)
Standard Colour for PCGI	RAL 9002
Make of PCGI Sheet	ISPAT / NATIONAL/ BHUSHAN / UTTAM
Locking System	Tounge & Groove system

FACIA SHEET SPECIFICATIONS PRECOATED GI (PCGI)			
PRECOATED GI (PCGI)			
Sl No	ITEM	VALUE	APPLICATION SPECIFICATIONS
1	Make	ISPAT / NATIONAL / BHUSHAN / EQV	IS - 277 / IS - 513
2	Thickness of Sheet	0.5 MM	IS - 513 - 01 D
3	Substrate	Cold Rolled Steel	IS - 513 - 01 D
4	Coatings	275 GSM	IS - 277
	A) Galvanizing	5 - 7 microns	
	B) Epoxy Primer	5 -7 microns	
	C) Alkyd Backer	8 - 10 microns	
	D) Polyster Top Coat	20 microns	
	E) Total Nominal Coating	Max : 25 microns	
5	Adhesion (Cross Hatch)	100%	BS : 39900
6	Specular Gloss (60º)	30 -85 %	ECCA T – 2 ASTM D - 523
7	Pencil Hardness	2 H	ECCA - T - 4

			ASTM D - 3363
8	Scratch Resistance	1500 g	BS 3900 / E – 2 IS - 101
9	Reverse Impact	5 mm per mm	BS 3900 ECCA TS
10	Bend Test	2 T	BS 3900/E1 ECCA T - 7
11	Ericson Test	76 mm	IS 10175 (82)
12	Corrosion Resistance		
	A) Salt Spray Test	700hrs	ECCAT-8
			ASTM - B - 117 773
	B) Humidity	1000 hrs	ECCA T - 9
			ASTM - D - 714
			BS 3900-F2
	C) QUV Weather Meter	1000 hrs	ECCA T 10
			ASTM - G - 53 84
13	Temperature Resistance	150º C	
14	Fire Resistance		
	A) Ignitability	Non Burning	BS - 476
	B) Fire Rating	Class - 1	BS - 476
15	Resistance Chemicals		
	A) Detergent Resistance	Pass	ASTM D 2248
	B) Acid Resistance	5% HCL : 24 hrs / Rt	
		5% HzSCa4 : 24 hrs. Irt	
		10% Citric Acid : 72 hrs	
		10% Acetic Acid : 72 hrs	
	C) Alkali Resistance	5% NaoH Solution	
		-24 hrs / Rt	
	D) Solvent Resistance	MEK-50	
	(double rubs)	Xylene - 100	
		Ethyl Alcohol - 100	
	E) Grease Resistance	50% Vegetable Oil	

		150 hrs	
		50% Oleic Acid	
	F) Stain Resistance	Grease - 72 hrs	ASTM - D 1308
		Boot Polish - 2 hrs	
	G) Boiling Water	2 hrs	Blister Resistance
	(Blister Resistance)		

Polyurethane Foam (PUF)			
Sl No	**ITEM**	**VALUE**	**APPLICABLE SPECIFICATIONS**
1	Material	Polyurethane Foam	BS 43 TO : 1960
2	Modular Density	40 +/- 2 Kg/m^3	BS 43 TO : 1960
3	Compressive Strength	1.2 Kg/sq.cm	BS 43 TO : 1960
4	Cross Breaking Strength	4 Kg/sq.cm	
5	Tensile Strength	55 PSI	
6	Continuous Service Temp.	85 Deg.C	
7	Thermal Conductivity @ 10 Deg.C	0.017 - 0.020 W/M ^0k	
8	Water absorption (% by vol)	3.1	ASTM C 272
9	Critical Oxygen Index	23	ISO 4589
10	Dimensional Stability -30 Deg.C / 28 Days	-0.40%	

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H.V.A.C. SYSTEM

TECHNICAL SPECIFICATIONS SHEET
FOR
H.V.A.C. SYSTEM OF COLD STORAGE

1. INTRODUCTION

To prevent spoiling of processed and packed honey, it has been proposed to construct a cold storage and maintain the temperature of stored honey at around 14 deg. C. For this purpose a suitable H.V.A.C. system is required to be installed. The cold storage area shall be heat insulated using 80 mm thickness PUF sandwich panels.

2. SCOPE OF WORK

The contractor is required to design, procure, supply, erect & commission the HVAC system with all sub components on a turnkey basis so that the required temperature and the humidity levels are maintained in the cold storage area.

3. SYSTEM CHARACTERISTICS & DETAILS

i. System Design Criteria

a.	Product to be stored	: Honey
b.	Holding capacity	: 100 MT
c.	Size of cold storage	: 250 sq. m
d.	Height	: 5.0 m clear
e.	Daily loading	: 20 MT
f.	Product loading temperature (max)	: 40 deg. C
g.	Temperature to be maintained	: 14 deg. C
h.	Humidity to be maintained	: Below 60%
i.	Pull down duration	: 24 hours
j.	Air changes per day	10
k.	Wall insulation	: 80 mm PUF panels
l.	Ceiling insulation	: 80 mm PUF panels
m.	Floor insulation	: Not applicable
n.	Lighting	: High bay LED lights
o.	Lighting connected load	: 1.25 KW
p.	Machinery inside cold storage	: Drum Filling machine
q.	Machinery connected load	: 5 KW

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

r. Persons inside cold storage : 6 on average
s. Doors : 2 no.'s
t. Door type : Insulated sliding doors
u. Door Panel Thickness : 100 mm PUF
v. Door size : 3000 x 2000 mm each
w. Racks : Not applicable
x. Plastic pallets : 1200 x 1200 x 100 mm
y. Temperature Conditions Chart

Out Door Design Conditions		**In Door Design Conditions**	
Season / Temperature		Season / Temperature	
Summer		**Summer**	
DB	110 Deg. F (43 Deg. C)	DB	15 Deg. C +/- 1 Deg C
WB	075 Deg. F (24 Deg. C)	Humidity	Below 60 %
Monsoon		**Monsoon**	
DB	095 Deg. F (35 Deg. C)	DB	14 +/- 1 Deg. C
WB	083 Deg. F (28 Deg. C)	Humidity	Below 60 %

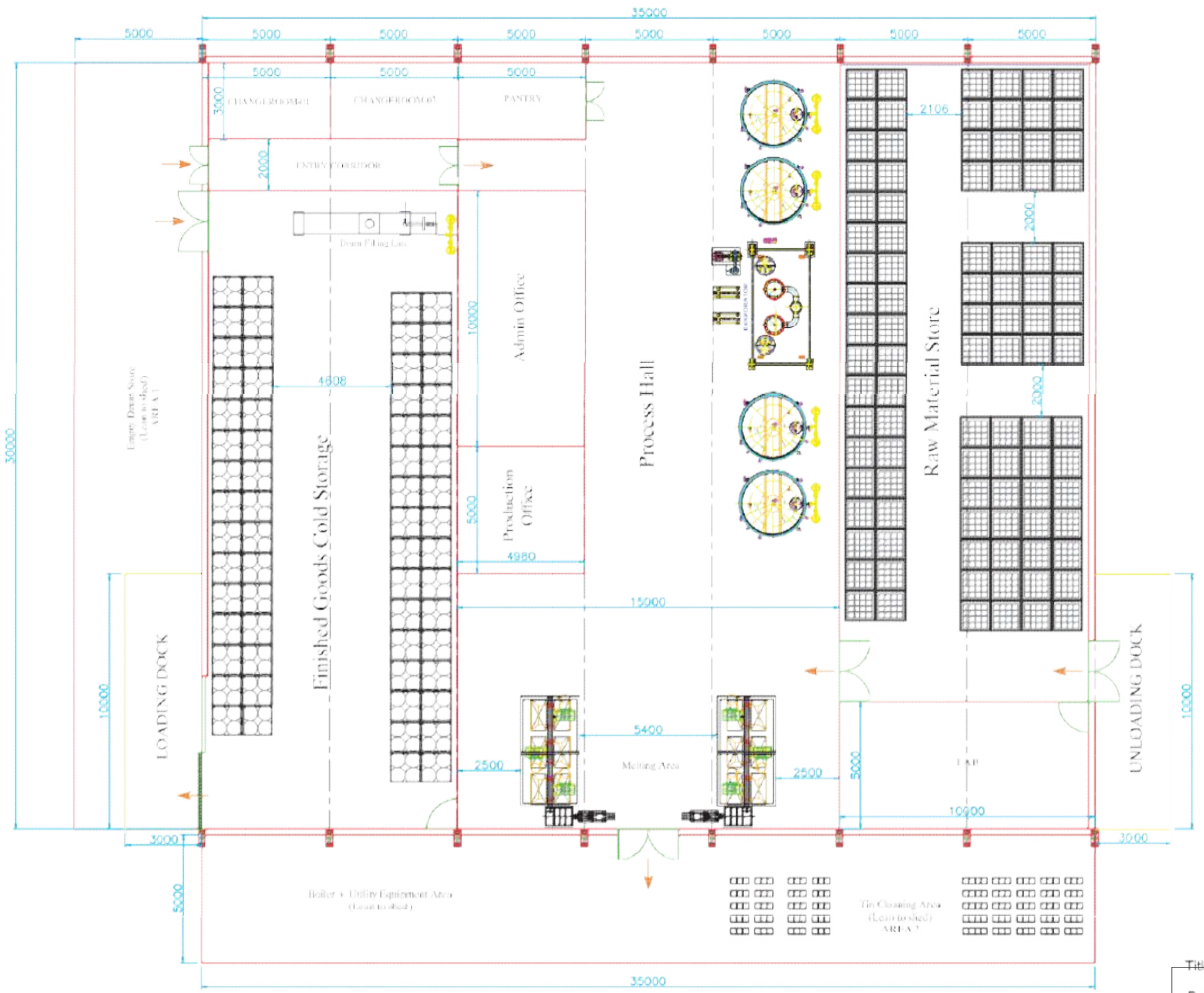
z. Designed Refrigeration Load : 20 TR***

***Contractor/ Vendor to submit his own heat load calculations for further vetting by consultants before start of any manufacturing/ fabrication works.

ii. System Details

a. Refrigeration system Proposed : One to One Split Type
b. Refrigeration system Quantity Proposed : 06 Set
c. Capacity of each Refrigeration System : 3.41 TR each
d. SST/SDT : 8 Deg C / 50 SDT
e. Refrigerant : R 22
f. Type of compressor : Hermetic Recip. Compressor
g. Make of compressor : Copeland /Emerson/Equivalent
h. Condenser Type : Air Cooled
i. Make of Condensing Unit : Vendor to specify
j. Connected power load : abt 15 KW/ Vendor design
k. Connected Electrical power : 415 Volts,50 Hz,3 Ph, A.C.
l. Type of evaporator units : Forced air cooled
m. Fan dia & No. of Fans each Unit : Vendor design
n. Fan Airflow : abt. 14000 cmh/ vendor design
o. No. of evaporator 6
p. Air throw range : Up-to 20 meters
q. Defrost type : Air
r. MoC of evaporative units : GI casing with Al fins
s. Make of evaporative units : Vendor to specify

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***



Typical Layout at Processing Hub 1, 2 & 3
(Bulk Packs)

Title : Typical Layout at Processing Hubs 1, 2 & 3 (Bulk)

Project : Setting-up of Honey Collection & Processing Infrastructure Facilities Under N.H.B.M. by N.A.F.E.D.

Mariental — Mariental India Pvt. Ltd

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CHECKED BY		29/06/202		
APPROVED BY		29/06/202	SCALE: NTS	REV
DRG. NO: E - 2105 - 06/01				0

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M.H.E. & PLASTIC PALLETS

TECHNICAL SPECIFICATIONS SHEET
FOR
M.H.E & PLASTIC PALLETS

1. INTRODUCTION

In a honey processing unit the Material Handling Equipment (M.H.E.) comprises of hand pallet trucks & plastic pallets. A hand pallet truck should be suitable to manually move goods placed on a pallet from raw material storage area to de-crystallizer area and then the empty buckets are stacked and moved to cleaning area. Empty drums kept on pallets are brought for filling using HPT and after filling they are further moved to cold storage. A HPT shall also used during loading of finished materials on containers.

2. SCOPE OF WORK

The contractor is required to supply four no.'s of 2.0 MT capacity Hand Pallet Truck (HPT) and 300 Plastic Pallets of size 1200x1000x150 mm per the specifications mentioned in this document.

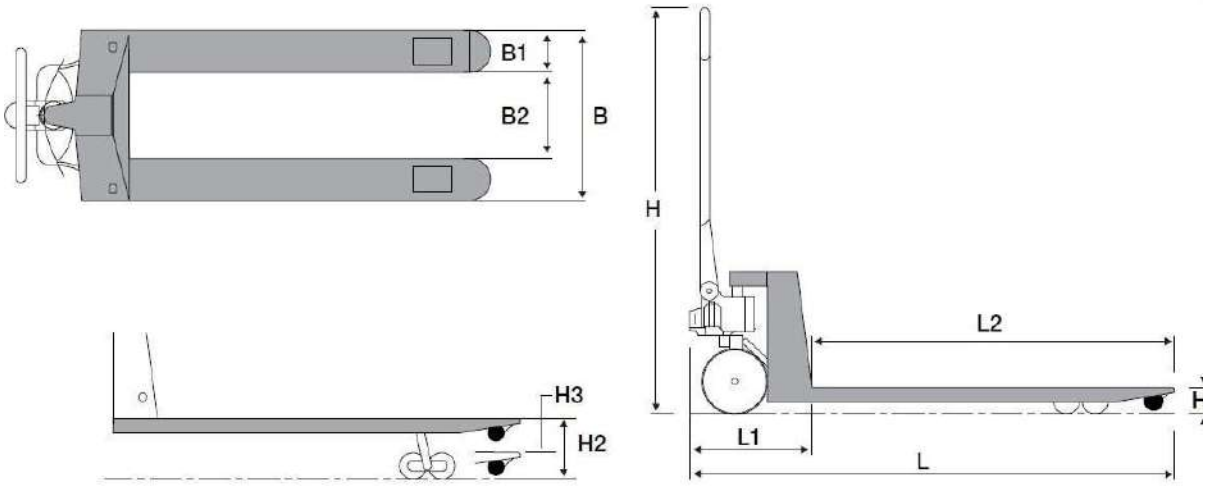
3. DETAILED SPECIFICATIONS

i. Hand Pallet Truck

a.	Load capacity	: 2000 Kg
b.	Fork length (L2)	: min 1500 mm
c.	Fork width (B1)	: min 160 mm
d.	Outside fork spread (B)	: min 550 mm
e.	Inside fork spread (B2)	: min 230 mm
f.	Maximum fork height (H2)	: max 200 mm
g.	Lift (H3)	: min115 mm
h.	Lowered fork height (H1)	: min. 85 mm
i.	Head length (L1)	: min 450 mm
j.	Overall length (L)	: max 1540 mm
k.	Overall height (H)	: max1220 mm
l.	Truck weight	: min 65 Kg/ Vendor design
m.	Steering wheels (Diameter x width)	: min180 mm x 50 mm/vendor design

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

n. Load wheel (Diameter x width) : min. 80 mm x 70 mm
o. Load wheel type : Tandem, Polyurethane
p. Drive wheel type : Polyurethane
q. Colour : Vendor design



QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.

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ii. Plastic Pallets/ Drum Pallets

a.	MoC	: HDPE
b.	Method of manufacturing	: Injection moulded
c.	Numbers required	: 300 pcs.
d.	Duty	: For honey buckets & drums
e.	Maximum load	: 1500 Kg
f.	Pallet size	: 1200 x 1000 x 150 mm
g.	Movement	: HPT & Forklift
h.	To be placed on	: Ground floor only
i.	Static load capacity	: 5,000 Kg
j.	Dynamic load capacity	: 1,500 Kg
k.	Rackable load capacity	: 1,200 Kg
l.	Colour	: Blue/ Vendor design

******QUANTITIES FOR SOME OF THE ITEMS ARE LIABLE TO CHANGE AS PER SITE CONDITIONS.***

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TENDER (TECHNICAL)
FOR
SUPPLY, INSTALLATION, COMMISSIONING
FOR
ESTABLISHING A HONEY TESTING LAB

NAFED

1. INTRODUCTION

The laboratory shall being set-up for a honey processing unit. The contract shall be on a turnkey basis. This purpose of this document is to describe the specifications and quantity of various equipment, lab glass ware, furniture etc. as required to set-up the lab.

2. SCOPE OF WORK

The contractor shall be required to procure, supply, install, commission and provide operation training to staff members the list of lab equipment/ material as per the details mentioned in this document.

3. DETAILED SPECIFICATIONS & QUANTITITIES

i. Equipment & Glass Wares

S. No.	Description	No. of
1	Application and Method Guaranteed HPLC (with UV, PDA and Multi Fluorescent Detector, Computer and Printer)	1
2	GAS CHROMATOGRAPH with FLAME IONISATION DETECTOR (F.I.D.), MICROPROCESSOR Controls with keyboard entry of process parameters and timing functions with user friendly software in ROM, method development facility and electricity failure back up. Automatic Temperature Programming facility with Four Ramp for Oven, initial mid and final timing and Auxiliary Temperature Control Channel besides Oven, Injector and Detector with Auto Diagnostics facility & AUTO COOLING FACILITY.	1
3	Double-Beam UV/Visible Spectrophotometer SPECIFICATIONS • Stray Light<0.15%T at 220 nm, 340 nm • Source Lamp Deuterium; Tungsten-Halogen • Beam Type Double • Bandwidth1.8 nm • Min Wavelength (nm)190 • Max Wavelength (nm)1100 • Wavelength Accuracy±0.3 nm • Min Photometric - Transmittance (%T)0 • Max Photometric - Transmittance (%T)200 • Min Photometric - Absorbance (A)-0.3 • Max Photometric - Absorbance (A)3 • Min Photometric - Concentration (C)0 • Max Photometric - Concentration (C)9999 • Photometric Drift<0.002 A/hr • Detector Solid-state • Output USB; RS-232	1

	• Description Scanning Double-Beam UV/Visible Spectrophotometer; 230 VAC	
4	Micro Plate Reader / Washer • Wavelength range 200–1000 nm • Wavelength resolution 1 nm • Wavelength accuracy 2 nm • Wavelength repeatability 0.2 nm • Bandwidth < 2.5 nm • Read-out range Up to 4 Abs Plate • Linearity @ 450 nm 0-2.5 Abs, • Precision @ 450 nm SD < 0.003 Abs or CV < 0.5% Stray light 0.05% @ 230 nm • Measurement speed (from A1 back to A1) 96-well plate: Fast mode: 6 s Precision mode: 27 s 384-well plate: Fast mode: 10 s Precision mode: 92 s • Spectral scanning speed 10 s from 200 to 1000 nm with 1 nm steps	1
5	Water purification systems Provides up to 72L/day of Type 1, ultrapure (18.2 meg ohm) water or Type 2 (10-15 meg ohm) water from tap water. Quick disconnects to make changing consumables easy, and all core consumables and tubing. Certifications: CSA, CE exception of 89230-328, 89230-344, 89230-346 and 89230-348.	1
6	Atomic Absorption Spectrophotometer with Compressor, Acetylene Regulator, Flash Arrestor, and 100 burner, Software Light Source 6/8 Lamps Automatic Turret with Independent Power Supply compatible to coded and non-coded HC Lamps Spectral • Range 185 to 900 nm • Bandwidth Automatic variable slit. from 0 to 2.5 nm. • continuously variable with . increment of 0.1 nm • Readability 0.1n m • Accuracy ± 0.5 nm • Repeatability ± 0.2 nm Detector Fuel • Wide Range Photo Multiplier Tube (PMT) Photometric • Range 0 to 2 Abs • Accuracy ± 0.010 Abs at 1.0 Abs • Integration Time 0.04 to 99 sec	1

7	Micro Controller Based Laboratory Centrifuge SPECIFICATIONS • Timer 1-99 minutes • Maximum RPM 4000 • Maximum RCF 2690 x g • Noise 65 dB • Weight 30 KG • Dimension 400 x 530 x 280 mm (W x D x H) • Documentation LABTOP should provide IQ, OQ, PQ documents with material test certificates and • calibration reports • Certifications ISO 9001: 2015, ISO 13485:2016 and CE • Rotor: 6 x 15 ml swing out rotor	1
8	Karl Fischer Moisture Titrator SPECIFICATIONS • Units%, ppm, mg/kg, µg • Display Type LCD • Display Resolution40-characters • pH Accuracy≤ ±0.5% • Data Logging Yes • Power (VAC)90 to 264 • Power (Hz)47 to 63	1
9	Analytical Balance, 220g x 0.1mg internal Calibration SPECIFICATIONS • Capacity (g)220 • Readability (g)0.0001 • Repeatability (g)0.0001 • Linearity (g)0.0002 • Weighing Units g, kg, ct, lb, oz, ozt, tlh, tls, tlt, GN, dwt, mg, parts/lb, tlc, mom, tol, bat, MS, N • Calibration Type Internal • Languages English, French, German, Hungarian, Italian, Polish, Portuguese, Russian, Spanish, Turkish, Chinese, Japanese, Korean • USB Interface Yes • Stabilization Time (Sec)2 • Auto Shutoff Yes • Power (VAC)100 to 240	1
10	Compact Portable Top-loading Balance, 2000g x 0.1g, 220V SPECIFICATIONS • Capacity (g)2000 • Readability (g)0.1 • Repeatability (g)0.2 • Linearity (g)0.3 • Weighing Units2.2 lb (1 kg) • Calibration Type External with calibration mass • Stability Indicator Yes	1

	• Stabilization Time (Sec)2 • Auto Shutoff Yes • Low Battery Indicator Yes • Battery6 x AA • Power (VAC)220	
11	Bench top Tinto-meter Comparator SPECIFICATIONS • Test Chemicals, edible oils and fats, petroleum oils, waxes	1
12	Viscometer SPECIFICATIONS • Accuracy±0.2% • Viscometer Type Cannon-Fenske Routine • Approximate Constant (cSt/sec)1.2 • Sample Volume Needed (mL)7 • Universal Size Number400 • Min Viscosity Range (cSt)240 • Max Viscosity Range (cSt)1200	1
13	Microwave Digester System Application: For acid digestion applications of samples like water, wastewater, soil, sludge, environmental samples, natural products, plant materials, food samples like- oil, sugar, vegetable, grains, organics, etc. for further analysis with AAS, ICP – OES or ICP – MS techniques. SPECIFICATION: • The cavity chamber must be made of corrosion resistant Stainless steel with multilayer fluoropolymer coating for physical protection as well as chemical resistance and should be greater than 7 ltrs in volume. • Microwave Power output: Minimum 1000 Watt or better for system with cavity • Vessels must be fully closed, corrosion resistant of any acid and gases, shouldn't crack or break or explode in case of overpressure development for any unknown sample reactions. • Controller: In-built color touchs creen display with real-time graphical representation of reaction parameters and display of internal temperature of every individual reaction. External controllers not acceptable. • System software must automatically adjust the power delivery based upon sample load, number of vessels and pre-programmed control settings without a need for user to define maximum power or re-optimize experimental conditions to accommodate change in number of sample vessels. • Rotor & Vessels: Rotor supplied with 12 or more high pressure vessels at a time. Rotor made of lightweight AL Material for high pressure strength upto 160 bar or more and to ensure ultrafast cooling. Must be provided with a lid with Hall Effect sensor for protection of cavity from acid vapors/fumes. • System must be equipped with an advanced temperature sensor to monitor internal temperature of ALL reaction vessels and	1

	display the internal temperature of each reaction vessel. There should not be any electronics plugs or sockets in the cavity to prevent corrosion. • Vessel volume: min 40 ml or more • Vessel filling volume: 3- 25 mL or more. • Sample weight: min 1.5 gm or more per vessel for inhomogeneous samples and trace level analysis. • Vessel material: Microwave transparent and reagent resistant suitable inert polymeric materials like TFM / PTFE / Fluoro polymer. Closure of the vessel must be possible by hand and overpressure release mechanism of the vessel must be controlled by means of metal springs for precise opening pressure independent of the reaction temperature or sample weight. • Max. Temperature: 250 °C or more • Max. Pressure: 45 bar or more • 100 numbers of glass inserts should be offered for the vessels provided. • A temperature calibrator for accurate temperature measurement must be supplied along with the instrument with minimum 3 years validity • Integrated high performance exhaust system for taking out fumes from the cavity. The vessels must be cooled inside the oven from 180 °C to 70 °C within less than 10 minutes. • Vendor must have a team of factory trained application personnel to provide user training and application training to the scientists for at least 1 days at the time of installation.	
14	Homogenizer Kit SPECIFICATIONS • Generator Included Yes • Min Sample Size (mL)0.25 • Min Sample Size (Liters)0.00025 • Max Sample Size (mL)30 • Max Sample Size (Liters)0.03 • Max Speed (rpm)30000 • Min Speed (rpm)5000 • Wattage (Output)125 • Power (VAC)220 • Power (Hz)50/60	1
15	Digital Refractometer for Refractive Index and Brix SPECIFICATIONS • Sugar Content Range 0.0 to 85.0% Brix; 1.3300 to 1.5080 nD; 1.3330 to 1.5040 nD_{20} • Sugar Content Resolution 0.1 % Brix; 0.0001 nD; 0.0001 nD_{20} • Sugar Content Accuracy ±0.2% Brix; ±0.0005 nD; ±0.0005 nD_{20} • Temperature Range 0 to 80°C (32 to 176°F) • Temperature Resolution 0.1°C (0.1°F) • Temperature Accuracy ±0.3 °C (±0.5 °F) • Temperature Compensation automatic between 10 and 40°C (50 to 104°F) • Automatic Shut-Off after three minutes of inactivity	1

	• Refractometre Light Source yellow LED • Minimum Sample Volume 100 µL (to cover prism totally) • Sample Cell stainless steel ring and flint glass prism	
16	KJELDAHL BLOCK DIGESTER SPECIFICATIONS • Number of Positions 250 ml x 20 nos • Temperature Controller LCD Display (Set and Actual) Yes • Element Temperature 450 C • Heating Chamber Unit Stainless Steel • Frequency (Hz) 50	1
17	Semi-micro Calorimeter Applications The ability of the Calorimeter to produce complete combustion and a measurable temperature rise with small samples in the 25 to 200 mg range makes this an excellent instrument for use in marine biology and related ecological studies where only limited amounts of sample are available. It also can be used for testing a variety of heat powders and pyrotechnic mixtures, particularly slow burning thermite types which are used to produce heat. Samples which contain their own oxidizers can be burned in an inert atmosphere, while others can be burned in oxygen. SPECIFICATIONS • Calorimeter Type Static • Operator Time per Test 6 Minutes • Precision Classification 0.40% • Number of Vessels Up to 4 • Tests per Hour 3 • Bomb Type and Bucket Removable Bomb Dewar Flask • Bucket Filling Manual • Oxygen Filling Manual • Bomb Washing Manual • Memory 1000 Tests • Printer Connection Ethernet • Balance Connection Ethernet, • Network Connection Ethernet • Temperature Resolution 0.0001 °C	1
18	Soxhlet Extraction Apparatus with Heating Mantle • Condenser Type Allihin • Effective Capacity ml 250 • Extractor Socket 45/40 • Extractor Cone 29/32 • Flask Capacity ml 500 • Capacity ml 500	1
19	Rotary Evaporator System w/ Manual Lift, slanted condenser & water heating bath to 90 deg C SPECIFICATIONS • Display Type Digital	1

	• Condenser Type Diagonal • Min Speed (rpm)10 • Max Speed (rpm)310 • Speed Resolution1 rpm • Evaporation Flask Size1000mL • Lift Mechanism Manual • Bath Type Water • Bath Capacity (L)4.3 • Min Temperature (° C)5° C above Ambient • Max Temperature (° C)90 • Temperature Control Accuracy 1° C • Power (VAC)230	
20	5.0-60µl Fully Autoclavable Bottle Top Dispenser • Accuracy ±0.360 ml (±0.6%) • Increments 1 ml • Research Model • Volume Range 5.0-60.0 ml • Standards Calibration & Accuracy As Per ISO 8655	1
21	Bench top digital multi-parameter instruments Digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. SPECIFICATIONS • pH range 0 - 14 • pH resolution 0.1/0.01/0.001 • pH accuracy ±0.1, ±0.01, ±0.005 • mV range ±2500; ±1200 • mV resolution 0.1; 1 • mV accuracy ±0.3; ±1 • Conductivity range 0.01 µS/cm - 1000 mS/cm (depending on sensor) • Conductivity accuracy ±0.5% of value • Conductivity cell constant (cm-1) Automatic • Resistivity range 1 Ωcm - 20 MΩcm (depending on sensor) • Salinity range 0 - 70 • TDS range 0 mg/l - 199.9 g/l • DO concentration (mg/l) 0.00 - 20.00; 0.0 - 50.0 • Calibration Anycal 5 point customer buffer calibration • max. 10 calibration storage • 1 up to 999 days calibration timer • Calibration points 1 to 5 (automatic buffer recognition) • DO saturation (%) 0.0 - 200.0; 0 - 500 • Temperature range (°C) auto: −5...+105 • Temperature resolution (°C) 0.1 • Temperature accuracy (°C) ±0.2 K • Data logging capacity Up to 4500 data sets in automatic • Data logging - log function Yes • Display Blacklit B/W graphic display • Connections 1 measurement input • Power supply 230 V with power supply or 4 × 1.5 V AA (supplied)	

	or via USB port • IP rating IP 43 • Parameters pH, mv, temperature, conductivity, dissolved oxygen, turbidity • Reference temperature 20/25 °C	
22	Ultrasonic cleaners SPECIFICATIONS Capacity (l) 5.7 Frequency (kHz) 35 Temperature range (°C) 20...69 (68...156°F) Timer 1 – 99 minutes	1
23	High Temperature Muffle Furnace SPECIFICATION • Maximum Temperature1450 to 1600 Deg C • Power220 V AC Single Phase 50 Hz	1
24	Micro Controller Based Laboratory Oven SPECIFICATIONS: • Temperature Range 5°C above ambient to 250°C • Temperature Accuracy ± 1.0 °C up to 80.0°C and ± 2.0 °C above 80.0°C • Temperature uniformity ± 3.0 °C • Inner Stainless steel 304, 0.8 mm & Outer mild steel,1.0 mm powder coated • Capacity in Liters : 120 • Nos of Trays: 3	1
25	Hot Plate Stirrer SPECIFICATIONS • Top Plate Material Ceramic coated stainless steel • Max Temperature (° C)320 • Max Load Capacity (kg)9 • Low Speed (rpm)0 • High Speed (rpm)2200 • Max Stirring Volume (Liters)10 • Diameter (in)5.51 • Max Operating Temperature (° C)40 • Motor Type Brushless DC • Power (VAC)230, 50Hz	1
26	Micro Controller Based Orbital Shaker SPECIFICATIONS • Timer 1-999 hrs • Motor Brushless Induction Motor • Drive VFD (Variable Frequency Drive) • Amplitude 50 mm • RPM Accuracy ± 5 rpm • Documentation LABTOP should provide IQ, OQ, PQ documents with Material Test Certificates and Calibration reports	1

	• Certifications ISO 9001: 2015 , ISO 13485:2016 & CE • Speed (rpm) : 30-350	
27	Micro Controller based circulating Water Bath with LID 20L SPECIFICATIONS • Temperature Range(°C) RT + 5 to 100 • Accuracy (°C) ±0.5 • Inner Stainless steel 316, 0.8 mm & Outer mild steel,1.0 mm powder coated • Bath Volume: 20L	1
28	Micro Controller based circulating Water Bath with LID 12L SPECIFICATIONS • Temperature Range(°C) RT + 5 to 100 • Accuracy (°C) ±0.5 • Inner Stainless steel 316, 0.8 mm & Outer mild steel,1.0 mm powder coated • Bath Volume: 12L	1
29	Micro Controller based circulating Water Bath with LID 22L SPECIFICATIONS • Temperature Range(°C) RT + 5 to 100 • Accuracy (°C) ±0.5 • Inner Stainless steel 316, 0.8 mm & Outer mild steel,1.0 mm powder coated • Bath Volume: 22L	1
30	AUTOCLAVE – 75 Litres SPECIFICATIONS: • Working Chamber Size (Ø x D): 400 x 600mm (16x24") • Liters: 75 • PSI : 15 • Carrier (Ø x D) : 1 of 350 x 550 mm	1
31	AUTOCLAVE –180 Litres SPECIFICATIONS: • Working Chamber Size (Ø x D): 550 x 760mm (22x30") • Liters: 180 • PSI : 15 • Carrier (Ø x D) : 2 of 500 x 350 mm	1
32	Micro Controller Based Bacteriological Incubator SPECIFICATIONS • Temperature Range(°C) 5°C above ambient to 60°C • Temperature Accuracy (°C) ±0.5 • Temperature uniformity: ±1.0°C • Inner Stainless steel 304, 0.8 mm & Outer mild steel,1.0 mm powder coated • Capacity : 300 L • No of trays: 4	1

33	Water Bath, Serological, Digital SPECIFICATIONS • Capacity Ltr. 24 • Drain included: Yes	1
34	Magnification Binocular Microscope	1
35	Digital Colony Counter; 90 to 240 VAC, 50/60 Hz	1
36	Viewing Cabinet for 4-watt UV Lamps	1
37	BIOSAFETY CABINETS CLASS II A2 SPECIFICATIONS • Working Area (mm) • External Size with stand (mm) • Inflow Velocity (m/s) 0.53 ± 0.025 • Down flow velocity (m/s) 0.33 ± 0.025 • Control system PLC / Manual • Display Colour HMI with touch screen / Deferential pressure Gauge • Air Flow system 70% air recirculation and 30 % exhaust • Front sash Toughened glass • Maximum opening (mm) 400 • Safe Opening (mm) 200 • Filter HEPA filter 99.999 % efficient • Particle Retention 0.3 microns • Class 100 • U V lamp 1 • Base Height (mm) 635 • Noise level (dB) ≤ 65 • Exhaust Volume (m3/h) 936 • Down-flow Volume (m3/h) 626	1
38	Digital Melting Point Apparatus, 240 VAC SPECIFICATIONS • Number of Samples2 • Min Temperature Ambient • Max Temperature (° C)300 • Temperature Accuracy±1.0°C at 20°C; ±2.5°C at 300°C • Temperature Resolution1°C • Heat-Up Time20°C per minute; 2°C per minute to melt • Temperature Sensor100Ω Pt RTD • Display3-digit LED	1
39	HEATING MANTLE SPECIFICATIONS • Capacity 500 ml	1
40	Laminar Air Flow	1
41	Mixer Grinder, 750W, 3 Jars	1

42	ANAEROBIC CULTURE JAR - POLYCARBONATE	1
43	PLC CONTROLLED STABILITY TEST CHAMBER SPECIFICATIONS • Temperature Range 20 to 60° C • Temperature Accuracy ± 0.2° C • Temperature Uniformity ± 2° C • Humidity Range 40 to 98% RH. • Humidity Accuracy ± 2% RH. • Humidity Uniformity ± 3% RH. • ICH Conditions 25° C/60%RH, 30° C /65%RH, 30° C /75%RH, 40° C / 75% RH, • Inner Stainless steel 304, 0.8 mm & Outer mild steel,1.0 mm powder coated • Capacity: 100Ltr • No. of Doors: 1 • No. of Trays: 2	1
44	Micro Controller based Vertical Deep Freezer SPECIFICATIONS • Temperature Range 0°C to -20.0°C • Accuracy ± 1.0°C • Uniformity ± 2.0°C • Inner Stainless steel 304, 0.8 mm & Outer mild steel,1.0 mm powder coated • Capacity in Litre: 90 • No. of Trays: 2	1
45	Micro Controller based Laboratory Refrigerator SPECIFICATIONS • Temperature Range 2°C to 8°C • Temperature Accuracy: ± 0.5°C • Uniformity ± 1.0 °C • Inner Stainless steel 304, 0.8 mm & Outer mild steel,1.0 mm powder coated • Internal Size(Litres) : 100 • Nos of Doors: Single • No. of Trays: 2	1
46	Mechanical pipettor	1 set
47	Micro-centrifuge, 8500 rpm; 100 to 240 VAC, 50/60 Hz SPECIFICATIONS • Max Speed (rpm)8500 • Max RCF x g3884 • Speed Control Fixed Speed • Rotors Included fixed angle 8 x 1.5- to 2.0-mL tubes, 32 x 0.2-mL strip tubes • Max Temperature (° C)40	1

	• Min Temperature (° C)5 • Max Temperature (° F)104 • Min Temperature (° F)41 • Noise level (dB(A))60 •	
48	Bottle Top Dispenser, Fully Autoclavable Volume Range 1 - 10 ml	1
49	Class 7 Weight Set; 100 g to 10 mg SPECIFICATIONS • Mass Class Class 7 • Mass Certification None • Height (in)0.8281 • Width (in)2.75 • Length (in)4.4062 • Contents of Set100g, 50g, (2) 20g, 10g, 5g, (2) 2g, 1g, 500mg, (2) 200mg, 100mg, 50mg, (2) 20mg, 10mg; polycarbonate case • Description Economical S.S. Class 7 Weight Set; 100 g to 10 mg	1
50	Interface/Linearizer Module for Single-Channel Flame Photometers SPECIFICATIONS • Description Digital Interface/Linearizer Module for Single-Channel Flame Photometers	1
51	Glassware & Consumables	LOT

ii. Laboratory Furniture

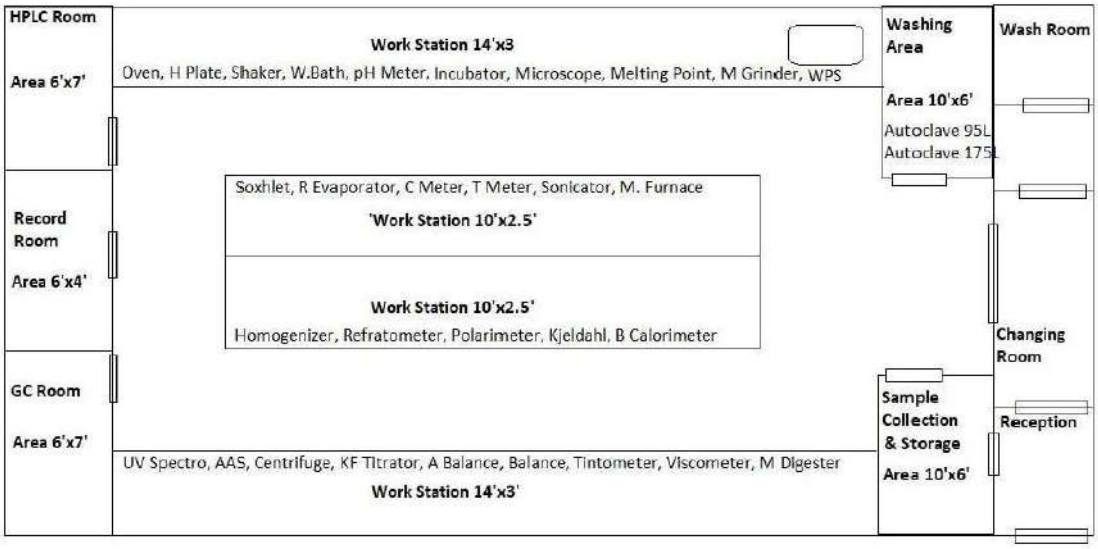
S No	Description	Unit Size
1.	WALL SIDE TABLE with size 3810X600X900mm (H) without leg space, storage modules having one drawer & two shutters in each. Modules shall be made of galvanized sheet of 1 mm thick with powder coating of 50-60 microns. All doors on hydraulic hinges for self closing. There shall be a provision of floor levelers in all legs. Top made of 18 (+-2) mm granite duly edge polished. There shall be a provision of one PP sink with scientific tap	1 No
2	ELECTRIC CABLE RACEWAY made of galvanized sheet of 1mm thick duly powder coated fitted with 6/16 AP switch and sockets of KONA/ANCHOR/RTH WEST (without wire)	12.5 ft
3	WALL SIDE TABLE with size 6096X750X900mm (H) without leg space, storage modules having one drawer & two shutters in each. Modules shall be made of galvanized sheet of 1 mm thick with powder coating of 50-60 microns. All doors shall have hydraulic hinges for self closing. There shall be a provision of floor levelers in all legs. Top made of 18 (+-2) mm granite duly edge polished.	1 No
4	ELECTRIC CABLE RACEWAY made of galvanized sheet of 1mm thick duly powder coated fitted with 6/16 AP switch and sockets of	20 ft

	KONA/ANCHOR/RTH WEST (without wire)	
5	WALL SIDE TABLE with size 6096X750X900mm (H) without leg space, storage modules having one drawer & two shutters in each. Modules shall be made of galvanized sheet of 1 mm thick with powder coating of 50-60 microns. All doors shall have hydraulic hinges for self closing. There shall be a provision of floor levelers in all legs. Top made of 18 (+-2) mm granite duly edge polished.	1 No
6	ELECTRIC CABLE RACEWAY made of galvanized sheet of 1mm thick duly powder coated fitted with 6/16 AP switch and sockets of KONA/ANCHOR/RTH WEST (without wire)	20 ft
7	WALL SIDE TABLE with size 3048X750X900mm (H) without leg space, storage modules having one drawer & two shutters in each. Modules shall be made of galvanized sheet of 1 mm thick with powder coating of 50-60 microns. All doors shall have hydraulic hinges for self closing. There shall be a provision of floor levelers in all legs. Top made of 18 (+-2) mm granite duly edge polished.	1 No
8	ELECTRIC CABLE RACEWAY made of galvanized sheet of 1mm thick duly powder coated fitted with 6/16 AP switch and sockets of KONA/ANCHOR/RTH WEST (without wire)	10 ft
9	WALL SIDE TABLE with size 7620X750X900mm (H) without leg space, storage modules having one drawer & two shutters in each. Modules shall be made of galvanized sheet of 1 mm thick with powder coating of 50-60 microns. All doors shall have hydraulic hinges for self closing. There shall be a provision of floor levelers in all legs. Top made of 18 (+-2) mm granite duly edge polished.	1 No
10	ELECTRIC CABLE RACEWAY made of galvanized sheet of 1mm thick duly powder coated fitted with 6/16 AP switch and sockets of KONA/ANCHOR/RTH WEST (without wire)	25 ft
11	WALL SIDE TABLE with size 2133X600X900mm (H) without leg space, storage modules having one drawer & two shutters in each. Modules shall be made of galvanized sheet of 1 mm thick with powder coating of 50-60 microns. All doors shall have hydraulic hinges for self closing. There is a provision of floor levelers in all legs. Top made of 18 (+-2) mm granite duly edge polished. There is a provision of one PP sink with scientific tap	1 No
12	ELECTRIC CABLE RACEWAY made of galvanized sheet of 1mm thick duly powder coated fitted with 6/16 AP switch and sockets of KONA/ANCHOR/RTH WEST (without wire)	7 ft
13	CENTER WORK STATION with size 3048X750X900mm (H) without leg space, storage modules having one drawer & two shutters in each. Modules shall be made of galvanized sheet of 1 mm thick with powder coating of 50-60 microns. All doors shall have hydraulic hinges for self closing. There is a provision of floor levelers in all legs. Top made of 18 (+-2) mm granite duly edge polished.	02 No

NAFED

Annexure I

Proposed Laboratory Layout



ANNEXURE – 2

DETAILS OF SITE OFFERED FOR SUPPLY, ERECTION & COMMISSIONING OF HONEY PROCESSING PLANT & AUXIALARY MACHINERY ALONG WITH UTILITY EQUIPMENTS, PIPING & SYSTEMS INCLUDING CIVIL WORKS

Sl No.	Location	Landmark	Size (LxB)	Qty	Area (sq.mt)
Unit 1.	Morena Distt., Madhya Pradesh National Agricultural Cooperative Federation of India Ltd.,			1	
Unit 2.	24 Parghana Distt., West Bengal National Agricultural Cooperative Federation of India Ltd.,			1	
Unit 3.	East Champaran Distt., Bihar National Agricultural Cooperative Federation of India Ltd.,			1	
Unit 4	Mathura Distt., Uttar Pradesh National Agricultural Cooperative Federation of India Ltd.,			1	
Unit 5	Bharatpur Distt., Rajasthan National Agricultural Cooperative Federation of India Ltd.,	Adjoining NAFED Warehouse		1	
Total					

Note-1: Area indicated above is approximate. Actual area measured at the time of handing over shall be final. If there is any variation in area of the particular project, the related Civil BOQ shall be amended accordingly and the contract value shall be calculated and modified on the basis of actual work done.

Note-2: The plot of land shall for setting up the Project shall be offered on FOC basis as available on ***"as is where is basis***".

ANNEXURE - 3

TECHNICAL BID FORM

(To be submitted on company's letter head)

No: Dated:

To,
General Manager,
FIFA / FOF
National Agricultural Cooperative
Marketing Federation of India Ltd. (NAFED),
NAFED House, Siddhartha Enclave
Ashram Chowk, Ring Road
New Delhi-110014

Sub: REQUEST FOR QUOTATION (RFQ) FOR EMPANELMENT OF AGENCY/AGENCIES FOR SUPPLY, ERECTION & COMMISSIONING OF HONEY PROCESSING PLANT & AUXIALARY MACHINERY ALONG WITH UTILITY EQUIPMENTS, PIPING & SYSTEMS INCLUDING CIVIL WORKS

Sir,

With reference to above subject, I/we, having examined the Bidding Documents and understood their contents, hereby submit my/our Bid for the aforesaid allotment of contract.

1. I/ We acknowledge that Nafed shall be relying on the information provided in the Bid and the documents accompanying the Bid for selection of the successful bidder for the aforesaid subject, and we certify that all information provided therein is true and correct; nothing has been omitted which renders such information misleading; and all documents accompanying the Bid are true copies of their respective originals.

2. I/ We shall make available to Nafed all / any additional information it may find necessary or require to supplement or authenticate the Bid.

3. I/ We acknowledge the right of Nafed to reject our Bid without assigning any reason or otherwise and hereby waive, to the fullest extent permitted by applicable law, our right to challenge the same on any account whatsoever.

4. I/ We declare that:

a) I/ We have examined and have no reservations to the Bidding Documents, including Addendum/ Corrigendum, if any, issued by Nafed; and

b) I/ We do not have any conflict of interest in accordance with provisions of the document; and

c) I/ We have not directly or indirectly or through an agent engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice, as stipulated in the document, in respect of any Bid or request for proposal issued by or any agreement entered into with Nafed; and

d) I/ We hereby certify that we have taken steps to ensure that in conformity with the provisions of the tender, no person acting for us or on our behalf has engaged or shall engage in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice; and

e) The undertakings given by me/us along with the Application in response to the for the above subject were true and correct as on the date of making the Application and are also true and correct as on the Bid Due Date and I/we shall continue to abide by them. I/We understand that you may cancel the Bidding Process at any time and that you are neither bound to accept any Bid that you may receive nor to invite the Bidders to Bid for the above subject, without incurring any liability to the Bidders, in accordance with provisions of the tender document.

5. I/We further undertake that after the expiry of the contract period or pre mature termination of the contract as per Terms & Conditions of Contract. We shall have no lien or any rights whatsoever on the said pillar allotted by the Nafed

6. The financial offer has been quoted by me/us after taking into consideration all the terms and conditions stated in the tender document, addenda /corrigenda, our own estimates of costs and after a careful assessment of the site and all the conditions that may affect the project cost and implementation of the project. I/We are satisfied with the locations of the said plot and fully understand & comprehend the technical requirements. I/We are also fully satisfied as to the business viability of cold storage and shall not claim any compensation, dues or any other consideration whatsoever on this account.

7. I/We agree and undertake to be jointly and severally liable for all the obligations of the contract/Contractor under the contract/ Agreement for the contract/ period in accordance with the Agreement.

8. I/we agree that the cost of Stamp Duty for execution of Agreement**,** Registration Charges and any other related Legal Documentation charges/incidental charges in pursuance of this tender will be borne by us.

9. I/We agree that all Taxes if any shall be borne by the liable party. GST as applicable shall also be borne by us or paid by us as applicable.

10. I/We agree that the allotted Plots for these projects are the property of Nafed or the JV and shall remain property of Nafed or the JV during contract period and after expiry of contract period or premature termination of contract agreement. The Contractor shall not make any claim/ compensation on this account including electrical wiring, fittings/fixtures meters etc. which shall become the property of the Nafed after the expiry/termination of the contract agreement.

11. We shall keep this offer valid for 120 (one hundred twenty days) days from the Bid Due Date specified in the tender document.

12. I/We hereby submit bid documents duly signed on each page as token of unconditional acceptance of all terms and conditions set out herewith. In witness thereof, I/we submit this Bid under and in accordance with the terms of the tender document.

Yours faithfully,

(Signature, name and designation of the Authorized signatory)
Name and seal of Bidder/Lead Member

Date:

Place:

ANNEXURE – 5

GENERAL INFORMATION OF THE BIDDER

1. Name of Bidder : _____

2. Complete postal address (with Telephone/FAX Nos./E-Mail)
   i. Corporate Office: _____
   ii. Addresses of all branch offices in India:_____
   iii. PAN & GST Details (submit a copy of each duly attensted):

3. In case of Consortium/JV the information above shall be provided for all the members of the consortium.

Sl. No.	Name of Member	Proportion of Equity to be held in the Consortium	Role*
1			
2			
3			

Specify whether Lead Member/ Ordinary Member signed

5. Details of the contact person who shall serve as point of communication with Nafed within company:
   a. Name :
   b. Designation :
   c. Address :
   d. Telephone Number :
   e. Fax Number :
   f. E-Mail Address :

6. Please indicate details and strength of bidder Co. in respect of following:
   Total value of revenue from related businesses conducted in the last three (3) years

7. Complete profile of company along with List of Projects with Value of Contract
   (*The above details shall be given year wise along with the name of clients in the form of self Certification along with the details as applicable*]

(Name of the Authorized Signatory) For
and on behalf of (Name of the Bidder)
Designation

Place: Date:

ANNEXURE – 6

CONSORTIUM AGREEMENT/MEMORANDUM OF UNDERSTANDING

(On Rs. 100/- stamp paper duly notarized)

This Consortium Agreement/Memorandum of Agreement is executed at _____ on this____ day of _____, 2021

BETWEEN

Mr._____R/o_____OR M/s _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at_____ acting through its_____duly authorized by a resolution of the Board of Directors dated_____(hereinafter referred to as the 'LEAD MEMBER' which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the ONE Part;

AND

Mr._____R/o_____OR M/s _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at_____and acting through its_____, duly authorized by a resolution of the Board of Directors dated_____(hereinafter referred to as the ('Participant member') which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the OTHER/SECOND PART

AND

Mr._____R/o_____OR M/s _____, a Company incorporated under the Companies Act, 1956 and having its Registered Office at_____and acting through its_____, duly authorized by a resolution of the Board of Directors dated_____(hereinafter referred to as the ('Participant member') which expression unless excluded by or repugnant to the subject or context be deemed to mean and include its successors in interest, legal representatives, administrators, nominees and assigns) of the THIRD PART]

WHEREAS Nafed has invited Bids for the " Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works" in terms of the Bid documents issued for the said purpose and the eligibility conditions required that the Bidders bidding for the same should meet the conditions stipulated by Nafed for participating in the bid by the Consortium for which the Bid has been floated by Nafed

AND WHEREAS in terms of the bid documents all the parties jointly satisfy the eligibility criteria laid down for a bidder for participating in the bid process by forming a Consortium between them.

AND WHEREAS all the parties hereto have discussed and agreed to form a Consortium for participating in the aforesaid bid and have decided to reduce the agreed terms to writing.

NOW THIS CONSORTIUM AGREEMENT/MEMORANDUM OF AGREEMENT HEREBY WITNESSES:

1. **That in the premises contained herein the Lead Member and the Participant Member having decided to pool their technical know-how, working experiences and financial resources, have formed themselves into a Consortium to participate in the Bid process for " Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works in terms of the Bid invited by Nafed.**

2. That all the members of the Consortium have represented and assured each otherthat they shall abide by and be bound by the terms and conditions stipulated by Nafed for awarding the Bid to the Consortium so that the Consortium may take up the aforesaid contract/agreement, in case the Consortium turns out to be the successful bidder in the bid being invited by Nafed for the said purpose.

3. That all the members of the Consortium have satisfied themselves that by pooling their technical know-how and technical and financial resources, the Consortium fulfills the pre-qualification/eligibility criteria stipulated for a bidder, to participate in the bid for the said Bid process for selection of highest responsive bidder.

4. That the Consortium have agreed to nominate any one of_____,____ and _____ as the common representative who shall be authorized to represent the Consortium for all intents and purposes for dealing with the Government and for submitting the bid as well as doing all other acts and things necessary for submission of bid documents such as Bid Application Form etc., Mandatory Information, Financial Bid. etc. and such other documents as may be necessary for this purpose.

5. That the share holding of the members of the Consortium for this specified purpose shall be as follows:
   i. The Lead Member shall have_____per cent (__%) of share holding with reference to the Consortium for this specified agreement.

   ii. The Participant Member shall have____(____%) of share holding with reference to the Consortium for this specified agreement.

6. That in case to meet the requirements of bid documents or any other stipulations of Nafed, it becomes necessary to execute and record any other documents amongst the members of the Consortium, they undertake to do the needful and to participate in the same for the purpose of the said project.

7. That it is clarified by and between the members of the Consortium that execution to this Consortium Agreement/Memorandum of Agreement by the members of the Consortium does not constitute any type of partnership for the purposes of provisions of the Indian Partnership Act and that the members of the Consortium shall otherwise be free to carry on their independent business or commercial activities for their own respective benefits under their own respective names and styles. This Consortium Agreement is limited in its operation to the specified projects.

8. That the Members of the Consortium undertake to specify their respective roles and responsibilities for the purposes of implementation of this Consortium Agreement and the said project if awarded to the Consortium in the Memorandum to meet the requirements and stipulations of Nafed

IN FAITH AND TESTIMONY WHEREOF THE PARTIES HERETO HAVE SIGNED THESE PRESENTS ON THE DATE, MONTH AND YEAR FIRST ABOVE WRITTEN.

1. Authorized Signatory For
   (Name of company)

2. Authorized Signatory For
   (Name of company)

3. Authorized Signatory For
   (Name of company)

Enclosure: *Board resolution of each of the Consortium Members authorizing:*
(i) Execution of the Consortium Agreement, and
(ii) Appointing the authorized signatory for such purpose.

ANNEXURE - 6

UNDERTAKING FOR RESPONSIBILITY
(On Rs. 100/- stamp paper duly notarized)

_____as a lead member of the consortium of___companies; namely _____
(Complete name with address) jointly & severely undertake the responsibility in regards to the agreement with Nafed in respect of Setting up of the Honey Processing Plants of Nafed or its JV at _ _____:-

1) That, we Solely undertake that_____(Name of the Company/ consortium member) shall conduct all transactions/ correspondences and any other activity in connection with contract/agreement pertaining to " Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works in terms of the Bid invited by Nafed".

2) That, all consortium members are jointly or severely responsible for all commitments / liabilities/ dues etc to Nafed or its JV.

3) That, we further confirm that, the stake holding of lead member-
(Name of the company/ consortium member) shall always remain more than 26% and we, all consortium members, insure that there shall be no change in the stake holding of all parties during the period of the agreement.

4) We also confirm that our consortium was made on Dt. , for seeking
Contract for Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works and in support of which a copy of our Board Resolutions are attached with this Undertaking.

(Authorised/ CEO of all_____consortium members to sign on undertaking with witness signatures)
1._____
2._____

Witness: 1. 2.

ANNEXURE-7

FINANCIAL BID FORM

(*To be submitted on company's letterhead)*

No. Date:

To,

General Manager,
FIFA / FOF
National Agricultural Cooperative
Marketing Federation of India Ltd. (NAFED),
NAFED House, Siddhartha Enclave
Ashram Chowk, Ring Road
New Delhi-110014

Sir,

With reference to the RFQ/ Tender No.___dated___inviting RFQ for " Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works at designated plots of Land allotted by NAFED. We have carefully studied scope and objectives of contract/ agreement and based on these, I/ We hereby submit our Financial Bid for the captioned Bid. If the contract is awarded to me/us, I/ we agree to complete the Job as per Scope of Services and BOQs in compliance with the Technical Specifications and Data Sheets and Drawings / Sketches enclosed the document and as per terms and conditions set forth in the tender Document.

Note:

1. All the taxes i.e GST etc, as applicable shall be borne solely by the successful bidder(s).
2. Successful bidder shall be decided on the basis of **Evaluation Procedure** mentioned in the document, based on experience and figures quoted by bidder(s).
3. In case two bidders quote the same price, then bidder having highest number of completed similar jobs in last 3 financial year will be awarded the contract.
4. All the columns of price bid format should be filled. Incomplete financial bids will be considered Non-responsive and shall be rejected.

Affirmation:

a) I / we affirm that the total price given above represents the Net Price to be paid by Nafed or its JV to us on account of Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works, if allotted to us, as per terms and conditions of tender and in accordance with the scope of work and price and is inclusive of all expenses and incidentals etc.

b) This offer is being made by me/ us after taking into consideration all the terms and conditions stated in the Bid document, and after careful assessment of the Plot of Land allocated for the said Project as per Annexure -1 offered, all risks and contingencies and all other conditions that may affect the financial Bid.

c) The utility charges like electricity, statuary dues/ taxes, local levies, etc. as applicable from time to time will be paid as extra charges by us to the concerned agencies directly without any delay or failure and proof of deposit of such taxes will be made available to Nafed, if required for any audit purpose.

Authorized signatory

FINANCIAL BID - SCHEDULE-1

MINIMUM COST FOR THE COMPLETE SCOPE INCLUDING SUPPLY, ERECTION & COMMISSIONING OF HONEY PROCESSING PLANT & AUXILIARY MACHINERY ALONG WITH UTILITY EQUIPMENTS, PIPING & SYSTEMS INCLUDING CIVIL WORKS

The minimum Cost payable by NAFED based on the Scope of Work on Terms and Conditions mentioned in the Tender Document shall be

Item Head	Cost in INR, on all inclusive basis
CIVIL WORKS	
PLANT & MACHINERY	
COLD STORAGE	
LABORATORY	
TOTAL	

Authorized signatory
(with stamp)

ANNEXURE-8

FORMAT FOR NON REFUNDABLE SECURITY DEPOSIT/BANK GUARANTEE

(*The Bank Guarantee shall either be from State Bank of India or any other Nationalized Bank or other Scheduled Commercial Banks with branches located in New Delhi only on non-judicial stamp paper of appropriate value*)

BANK GUARANTEE NO. dated

This Deed of Guarantee executed at by (Name of Bank) having its Head / Registered office at (hereinafter referred to as "the Guarantor") which expression shall unless it be repugnant to the subject or context thereof include its successors and assigns;

In favour of General Manager, FIFA / FOF National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED), NAFED House, Siddhartha Enclave Ashram Chowk, Ring Road New Delhi-110014 which expression shall unless it be repugnant to the subject or context thereof include its successors and assigns;

WHEREAS: -

1. Nafed, with a view to augment its income through non-operating revenue, had earlier invited tender for "allotment of contract for Supply, Erection & Commissioning of Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works at designated plots of Land allotted by NAFED

2. The Contractor shall setup, commission and handover the Unit as specified in this agreement at cost mentioned in the agreement.

3. Nafed has agreed to provide to the Contractor the Plot (as per annexure 1) on "as is where is basis", on the terms and conditions contained in the agreement for the Project to be completed earlier or extended further as per agreement.

4. This implementation and handing over period is 6 months from the date of Letter of acceptance (LOA) and may be extended on the basis of site conditions and work performance as deemed necessary by Nafed.

5. The tender offer submitted by M/s_____having their registered office at _____has been accepted by Nafed vide LOA No. _____dated_____.

6. As per the terms of the above mentioned LOA, the Contractor has to Supply, Erect & Commission the Honey Processing Plant & Auxiliary Machinery along with Utility Equipments, Piping & Systems including Civil Works as per terms of the Bid invited by Nafed and the agreement on the said plot during the defined period.

7. The Contractor shall also: -

i. bear and pay all expenses, costs and charges incurred in the fulfillment of all its obligations under the agreement; and

ii. not assign or create any lien or encumbrance on the Plot of Land hereby allotted for setting up the Project or on the whole or any part of the Project Facility nor transfer,

lease/ or part possession therewith save and except as expressly permitted by the agreement.

8. The Contractor is required to furnish an unconditional irrevocable Bank Guarantee for an amount of Rs._____(Rupees_____only) i.e. valid for period of 6 months as per provisions of the agreement, as security for the performance and fulfillment of all its responsibilities and obligations as per the agreement. The Contractor has requested the Guarantor to issue the said Bank Guarantee in favour of Nafed, New Delhi

10. Now, therefore at the request of the Contractor, the Guarantor has agreed to execute this Guarantee in favour of Nafed for the due payment of Rs._____(Rupees _____only) valid till_____.

NOW, THEREFORE, THIS BANK GUARANTEE WITNESSETH AS FOLLOWS: -

a) The Guarantor, as primary obligor shall, without demur, reservation, contest, recourse or protest and/or without reference to Contractor, pay to Nafed an amount not exceeding Rs._____(Rupees_____only), on the same working day of receipt of a written demand from Nafed, calling upon the Guarantor to pay the said amount and stating that the Bank Guarantee provided by the Contractor has been forfeited.

b) The Guarantor agrees that Nafed shall be the sole judge to decide as to whether the Contractor has defaulted in the performance of its obligations as per the agreement, and the decision of Nafed in this regard shall be final and binding on the Guarantor, notwithstanding any differences in this regard between Nafed and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other Authority.

c) Any such demand made on the Guarantor by Nafed shall be conclusive, absolute, final and binding on the Guarantor, and the amount due and payable by the Guarantor under this Guarantee will be honored by the Guarantor, simply on demand, without demur, reservation, contest, protest, recourse whatsoever and without need for ascribing any reason to the demand. The liability of the Guarantor under this guarantee is absolute and unequivocal. The above payment shall be made without any reference to the Contractor or any other person.

d) This Guarantee shall be irrevocable, valid and remain in full force till the end of the execution Period, or for such extended period as may be mutually agreed between Nafed and the Contractor, and shall continue to be enforceable till all amounts under this Guarantee are paid. The said Guarantee shall be released by Nafed after the expiry of the execution Period subject to fulfillment of all handover requirements by the Contractor, to the satisfaction of Nafed and further subject to adjustment for all damages suffered by Nafed

e) This Guarantee is unconditional and irrevocable till such time Nafed discharges this guarantee by issuing a letter to the Guarantor in this behalf.

f) The Guarantor undertakes to pay the amount mentioned herein as principal debtor and not a surety and it shall not be necessary for Nafed to proceed against the Contractor before proceeding against the Guarantor, notwithstanding the fact that Nafed may have obtained or obtains from the Contractor, any other security which at the time when proceedings are taken against the Guarantor hereunder, is outstanding and unrealized.

g) The obligations of the Guarantor shall not be affected by any variations in the terms and conditions of the agreement or other documents or by extension of time of performance of any obligations granted to the Contractor or postponement / non-exercise / delayed exercise of any of its rights by Nafed against the Contractor or any indulgence shown by Nafed to the Contractor, and, the Guarantor shall not be relieved from its obligations under this Bank Guarantee on account of any such variation, extension, postponement, non exercise, delayed exercise or omission onthe part of Nafed or any indulgence by Nafed to the Contractor to give such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving the Guarantor.

h) The Guarantee shall not be affected by any change in the constitution or winding up of the Contractor/the Guarantor or any absorption, merger or amalgamation of the Contractor / the Guarantor with any other person.

i) The Bank agrees that Nafed at its option shall be entitled to enforce this guarantee during its currency against the bank as a Principal Debtor in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that Nafed may have in relation to Contractor's liabilities.

j) The guarantee hereinbefore contained shall not be affected by any change in the constitution of the Bank or of the Contractor.

k) The expressions "Bank" and "Contractor" hereinbefore used shall include their respective successors and assigns. l) The Courts at Delhi shall have exclusive jurisdiction to adjudicate on any or all matter arising under this Guarantee. m) The Guarantor declares that it has power to issue this Guarantee and discharge the obligations contemplated herein and the undersigned is duly authorized to execute this Guarantee. n) This guarantee shall come into effect forthwith and shall remain in force up to or the extended period if any and shall not be revoked by the Guarantor at any time without Nafed's prior consent in writing. This Guarantee is valid for a period of_____Months from the date of signing.

[The initial period for which this Guarantee will be valid must be for at least for six months from the date of Agreement.]

IN WITNESS WHEREOF THE GUARANTOR HAS EXECUTED THIS GUARANTEE ON THE DAY, MONTH AND YEAR FIRST ABOVE MENTIONED THROUGH ITS DULY AUTHORISED REPRESENTATIVE.

For and on behalf of the_____Bank.
Signature of authorized Bank official
Name:_____
Designation: _____
I.D. No.:_____
Stamp/Seal of the Bank: _____
Signed, Sealed and Delivered for and on behalf of the Bank by the above named

In the presence of:

Witness-1
Signature _____
Name_____
Address_____

Witness-2
Signature_____
Name_____
Address_____