

**INQUIRY FOR DESIGN, SUPPLY, INSTALLATION AND  
COMMISSIONING OF BOILER**

**FOR**

**CORE PROCESSING FACILITIES  
AT MUDARDA VILLAGE,  
MEHSANA,  
GUJARAT.**

**JUNE 2018**

**OWNER  
FANIDHAR MEGA FOOD PARK PVT LTD.  
10/11, SECOND FLOOR,  
ORCHID THE SHOPPING MALL,  
THALTEJ SHILAJ ROAD,  
THALTEJ, AHMEDABAD  
GUJARAT-380059**

**PROJECT MANAGEMENT CONSULTANT  
TECHNOPAK ADVISERS PVT. LTD.  
GURGAON**



**DESIGN CONSULTANT  
VMS ENGINEERING & DESIGN SERVICES (P) LTD  
CHITRAKOOT FLATS, B/H, TIMES OF INDIA,  
OFF. ASHRAM ROAD, AHMEDABAD 380 009  
PHONE: +91 (79) 2658 8829 – 2480 -4488,  
FAX: +91 (79) 2658 3596  
EMAIL: [vms@vmsconsultants.com](mailto:vms@vmsconsultants.com) ,  
WEB: [www.vmsconsultants.com](http://www.vmsconsultants.com)**

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## SECTION - A: INVITATION TO TENDER FOR DESIGN, SUPPLY, INSTALLATION, AND COMMISSIONING WORKS OF SOLID FUEL FIRED STEAM BOILERS

- 1.0 Tenders are invited for Design, Supply, Installation, and Commissioning of Boiler for various CPC components in MFP at Mudarda Village, Mehsana, Gujarat, as mentioned in "Scope of Works" for Fanidhar Mega Food Park Pvt. Ltd. ("Owner").
- 2.0 Tender Documents shall be download from the website [www.fmfp.co.in](http://www.fmfp.co.in). A Tender processing fee (non-refundable) of Rs 5,000 to be submitted in form of cash or DD at the time of submission of tender.
- 3.0 Tender Documents will be submitted to

(A) Mr. Ajit Dhranga  
+91-9586432323  
E-Mail: info@fmfp.co.in

**FANIDHAR MEGA FOOD PARK PVT LTD.  
10/11, SECOND FLOOR,  
ORCHID THE SHOPPING MALL,  
OPP. THALTEJ LAKE,  
THALTEJ, AHMEDABAD  
GUJARAT-380059**

All inquiries and correspondence shall be directed in writing to the above **address**.

- 4.0 The tenderers should return their completed Tender in two parts – separately and distinctly marked (i) Volume – 1 of 2 (ii) Volume – 2 of 2 ("Tender"). The Tender will be received at the address given above by 3.00 p.m. local time on **29.06.2018**.

Submission of tender:	<p>1. The tenderer shall submit the documents in two separate envelopes marked as</p> <p>ENVELOPE 'A' –EMD and other all documents except price bid</p> <p>AND</p> <p>ENVELOPE 'B' – Technical Specification and Price Bid</p> <p>2. These two envelopes shall be packed in one cover envelope addressed as under – <b>ADDRESS AS PER ABOVE</b></p> <p>3. Only the "ENVELOPE A" shall be opened first and eligibility of the tenderer shall be evaluated as per criteria defined above. "ENVELOPE B" shall be opened only for those tenderers who qualify as per the eligibility criteria.</p>
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### 5.0 Documents To Be Submitted –

- 5.01 Envelope A –
- 5.01.1 CA Certificate of last three years Turn Over
- 5.01.2 CA Certificate of company net worth
- 5.01.3 List of successfully completed projects of last three years with client name and contract value.

- 5.01.4 EMD of Rs 1 Lakh in the form of DD or BG in favor of Fanidhar Mega Food Park Pvt Ltd ; payable at Ahmedabad.
- 5.01.5 ITR last three years
- 5.01.6 Verifiable Client References
- 5.01.7 List of technical manpower
- 5.01.8 List of machines in manufacturing facility
- 5.01.9 Proof of technology association if any
- 5.01.10 Proof of international exposure if any

#### 5.02 Envelope B

- 5.02.1 Design Layout and Details with utility & their connection requirements.
- 5.02.2 PI Diagram
- 5.02.3 Specifications
- 5.02.4 Itemized Quotation

### 6.0 Eligibility Criteria

- 6.01 Should be working in this field for at least 10 years
- 6.02 Must have supplied similar or higher capacity boiler in past three years
- 6.03 Must have a AMC and service provision to the project site on as short notice
- 6.04 Should provide design bench marking for low energy consumption and energy recovery
- 6.05 Average three years turnover should be more than or equal to the quoted price.
- 6.06 Organization should be profitable.

### 7.0 Components from reputed OEM are accepted.

### 8.0 Typical Payment Terms

- 8.01 Mobilization advance to a max of 50 % against submission of equivalent amount of BG or a corporate guarantee
- 8.02 Max 40 % Payment against dispatch of plant and machinery
- 8.03 Max 5 % against installation and commissioning

### 9.0 Max 5 % against submission of BG valid for 12 months after acceptance of installation and commissioning report. The BG shall be released after completion of this defect liability period.

### 10.0 The Owner reserves the right to accept or reject any or all Tenders without giving any reasons thereof, in their sole discretion and without any liability or costs to the tenderer. The Owner clearly states that this is merely an invitation to an offer and is not an offer, and therefore makes no obligation in any way to pay any tenderer for any response or to award the tender or make any commitment to any tenderer whatsoever. The Owner may further waive any deviations which do not constitute a material modification in the Tenders received. In the event that there are any other material deviations in the Tender, the Owner may in its sole discretion reject and remove such deviations from the Tender and accept the same. The decision whether the deviation constitutes a material modification shall solely be that of the Owner and such decision shall be binding on the tenderer(s).

### 11.0 One Bid per Bidder

- a. Each bidder shall submit only one bid for one contract. A bidder who submits or participates in more than one Bid (other than as a Sub-contractor or in cases of

alternatives that have been permitted or requested) shall cause all the proposals with the Bidder's participation to be disqualified.

- b. Tender documents are not transferable.

## **12.0 Cost of bidding**

The bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer shall in no case be responsible and liable for those costs.

## **13.0 Site visit**

The Bidder may visit the site and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

## **14.0 Clarification of Bidding Document**

- a. A prospective bidder requiring any clarification of the bidding documents may notify the Employer in writing by mail at the PMC's and Employer's mail address & indicated in the invitation to bid. The Employer shall respond to any request for clarification which he received earlier than 7 days prior to the deadline for submission of bids. Copies of the Employer's response shall be forwarded to all purchasers of the bidding documents, including a description of the enquiry but without identifying its source.

## **15.0 Amendment of Bidding Documents**

- a. Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing tender addends.
- b. Any addendum thus issued shall be part of the bidding documents and shall be communicated in writing through email or by fax to all the purchasers of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum by fax to the Employer. Addenda shall be incorporated in the bids submitted by the Bidder

## **General Conditions**

### **1. Co-ordination between different Agencies**

The Contractor shall submit the details of Erection works programme to the engineer who will co-ordinate with the programme of the Civil / Mechanical / Electrical contractor separately submitted to him. Such co-ordination of Civil / Mechanical / Electrical and Erection works programme shall be agreed between the engineer, erection and civil works contractors and the agreed programme shall then be mutually binding on Contractors for Civil / Mechanical / Electrical & PEB Erection.

### **2. Insurance**

- a. The Contractor shall indemnify the Owner and every member, Officer, and Employee thereof and the Engineer and the Engineer's Agents and Representative and every member of his staff from any claim or demand from accident, injury, damage, loss and/or compensation of any kind whatsoever arising out of or in connection with all claims and demands which may be made against the Owner or the Engineer for or in respect of or arising out of failure by the Contractor in the performance of his

obligation under any of the provisions of the Contract. The Contractor shall take necessary insurance to protect himself against claim or demand.

- b. Without prejudice to his liability to indemnify the Owner under Article (a) of these Conditions, the Contractor shall maintain and shall cause any Sub- Contractor to maintain: -

Such insurances as are necessary to cover the liability of the Contractor or as the case may be of such Subcontractor, in respect of personal injuries or deaths arising out of or in the course of or caused by the carrying out of the work; and

Such insurances as may be specifically required by the Contract Bills in respect of injury or damage to property real or personal arising out of or in the course of or by reason of the Contractor or his Sub-Contractor carrying out the work, and caused by any negligence, omission or default of the Contractor, his servants or agents or, as the case may be of such Sub- Contractor, his servants or agents.

- c. The Contractor shall obtain and maintain a comprehensive all risk policy which should also cover insurance against loss or damage by fire, storm, tempest, lightning, flood, earthquake, aircraft or anything dropped there from, aerial objects, riot and civil commotion for the full value thereof all work executed and all unfixed materials and goods intended for, delivered to and placed on or adjacent to the work until Virtual Completion of the work. Should the Contractor make default in insuring or continuing to insure as aforesaid the Owner may himself insure against any risk with respect of which the default shall have occurred and deduct a sum equivalent to the amount paid by him in respect of premium from any monies due to or to become due to the Contractor.

### **3. Approval by the Owner / the Engineer**

Any approval given with changes, by the Owner, Engineer or their representative shall not relieve the Contractor of any of its obligation, responsibility and liability for the safety, correctness and performance of the Works and his obligations hereunder.

### **4. Storage**

It will be Contractor's responsibility to unload and store materials/Equipments properly. Storage of materials/Equipments received at site will be Contractor's responsibility. Contractor will be responsible for it till the handover of site.

### **5. Safety**

- a. Workers required to work at higher elevations shall be provided with safety belts and shall be instructed not to work without wearing the Belt.
- b. Good quality safety helmets shall be provided to Workers posted at Site of operations and Contractor will take adequate measures to make usage of these helmets mandatory.
- c. Where there is danger of falling from a height exceeding 3.25 m., suitable precaution shall be taken to prevent the fall of persons or material. Suitable precautions shall also be taken to prevent persons being struck by articles, which might fall from scaffolds or other working places.
- d. In general, the Contractor shall adhere to safe construction practice and guard against hazardous and unsafe working conditions and shall comply with Owner's safety rules.

- e. The Contractor shall adhere to all safety rules and regulations as indicated under attached OHS Manual.

**Scope of Works**

- a. Design, Supply, Packing & Forwarding of Machine/Equipment/Components.
- b. Unloading of Machine/Equipment/Components,
- c. Unpacking of machines/equipment/components packed parts,
- d. Shifting of all unpacked material/equipment/components to installation location place
- e. Assembling of all material machine parts/equipment/components parts
- f. Erection of all material machine/equipment/components.
- g. Achieve required levelling and alignment of machine/equipment/components.
- h. Commissioning & testing of installed machine/equipment/components.

## **SECTION – B: TECHNICAL SPECIFICATION FOR BOILER**

### **PART A:**

#### **1. GENERAL**

The Scope covers Design, Manufacturing, Inspection, Assembly, Testing, Packing, forwarding, Supply, Storage at Site, Installation, start up, Commissioning and Supervision during erection, commissioning and providing Performance Guarantee tests of one solid fuel fired steam boiler of capacity 11 TPH @ 21 bar saturated steam.

The Boiler shall be Complete with Pressure Part, Technological Structures, associated Auxiliaries, Electricals, BOP, and Instrumentation & Controls as Specified.

All items of Equipment shall be complete in all respects and any Equipment not covered in this specification but essential for proper Installation, Operation and maintenance shall be included in the offer and the reasons for such inclusion shall be clearly stated.

Boiler shall be strictly in accordance with IBR Standard Latest Edition for all pressure Parts Design.

The specification shall be studied thoroughly regarding the workability of the plant and equipment. The Bidder shall take full responsibility for the Guaranteed Operation of the Steam Boiler and Associated Auxiliaries Equipment as Regards to Output, Performance, Reliable and safe working of facilities indicated in the Specification. If the Technical data for the Equipment and facilities indicated in the specification can be improved upon, the same shall be indicated and an alternative Proposal shall be submitted on the Basis of Design the Bidder considers suitable for meeting the required Parameters and duty requirements.

The Bidder shall confine all his office, stores, fabrication yard constructional Plant and Equipment etc. in the area as may be allotted for this purpose. Only leveled vacant land will be provided by the Purchaser. On completion of works and/or termination of contract, the Bidder shall dismantle and remove his office, stores and other temporary facilities and reinstate the area to the original conditions. Bidder shall indicate his requirements of area for construction yard and fabrication yard for this purpose in his Tender.

Where found necessary, the Purchaser reserves the right of selecting the manufacturers of Mechanical, Electrical Equipment, Instruments and any other specialized items in the interest of standardization and the successful Bidder shall agree to supply Equipment of the particular make, if so required

However, the Bidder shall submit a list of sub-vendors for all the Equipment to be Procured by him as “bought out” items for Purchaser’s review / approval and this should also be based on serial no 6. The successful Bidder shall agree to procure the bought-out items from the sub-vendors approved by the Purchaser. No new parties will be considered for inclusion after order placement

It is not the intent of this specification to completely specify all the details of design and construction. Nevertheless, the equipment to be supplied by the Bidder shall conform to the high standards of Engineering, design, and workmanship in all respect.

#### **2. SITE CONDITIONS:**

The Site is at Mehasana Taluka, Gujarat.



## 2.1 Climatic Conditions:

Maximum dry bulb temperature, °C:	45
Minimum dry bulb temperature, °C:	7
Average Number of days above 32 °C in a year:	173
Maximum relative humidity, %:	90
Minimum relative humidity, summer %:	24
Summer (Design)	
Dry bulb temperature, °C:	43.5
Wet bulb temperature, °C:	25.5
Monsoon (Design)	
Dry bulb temperature, °C:	32
Wet bulb temperature, °C:	29
Winter (Design)	
Dry bulb temperature, °C:	15
Wet bulb temperature, °C:	10

## 2.2 SEISMIC ZONE: - Zone III

### 3. ELECTRICAL POWER SUPPLY:-

Electricity Power: 410 V  $\pm$  10%, 50Hz  $\pm$  3%, 3 PH, A.C.

Control Voltage: As required with the help of step down transformer provided by bidder.

Note: For field instruments, Supplier to step down.

### 4. STANDARDS AND OTHER REQUIREMENTS:-

The Equipment and Components shall conform to relevant Indian Standards published by the Bureau of Indian Standards. Where suitable Indian Standards are not available, Equipment shall conform to generally accepted codes and practices in India or Globally.

All items of Equipment shall comply with the latest India Boiler Regulations and stipulations of Inspectorate of Factories and other statutory bodies of Government of India and Chief Electrical Inspectorate of the State in which the plant site is located, wherever applicable. Wherever required the successful Bidder has to obtain the necessary approvals from statutory authorities and other concerned agencies. All cost on these accounts shall be borne by the successful Bidder.

Workmanship and materials shall be of first class quality and in accordance with the highest Standards and Practices for Equipment of the class covered by the specification.

All items of Equipment shall be thoroughly cleaned and Painted with two coats of approved primer and minimum two coats of approved finish Paint.

The term 'Painting' referred herein covers rust Preventive and Decorative Organic, Inorganic and Metallic Coating and surface protection for the Equipment/Components including the following:

- Structural Steelwork
- Various Equipment inclusive of Electric Motors, Panels, Control desks and Accessories.
- Steel Tanks, Heat Exchangers and Vessels. Pipe work including supports, hangers etc.

Safety preparation, being a pre-requisite for any paint application, shall be such as to clean the

surface thoroughly of any materials which will be conducive to premature failure of the paint substrata.

All surfaces shall be cleaned of loose substances and foreign materials, such as dirt, rust, scale, oil, grease, welding flux etc. irrespective of whether the same has been spelt out in the standards or not in order that the prime coat is rigidly anchored to the virgin metal surface.

The Bidder shall adopt good engineering practices such as well-balanced machinery, acoustically correct enclosures, structures and supports from resonance, acoustically designed fluid paths for ducting and pipe work etc. The noise level shall be restricted to 85 dB(A) @ 1 M distance for all rotating equipment like ID fan, FD fan, PA fan, boiler feed pumps etc. Suitable silencers shall be provided at the outlet of safety valve to limit the noise level to 85 dB(A) at 1 M distance.

## PART B. SCOPE OF WORK OF SUCCESSFUL BIDDER

### 1. TECHNICAL SPECIFICATION

TECHNICAL SPECIFICATION FOR 11 TPH STEAM BOILER			
Sr.No.	Description	Client Requirement	Tenderer Name with Contact Details (Below Details Confirmation / Specification by Tenderer)
<b>1</b>	<b>Boiler</b>		
1.1	Make	Vendor to specify	
1.2	Model no	Vendor to specify	
1.3	Steam Output F & A 100 °C	11 TPH	
1.4	Steam outlet pressure	21 kg/cm <sup>2</sup>	
1.5	Steam outlet temperature	Saturated @ operating pressure	
1.6	Pollution control equipment	Electro static precipitator	
1.7	Type of Combustor	Reciprocating grate	
1.8	No. of passes	vendor to confirm	
1.9	Design code	IBR-1950 with latest amendment	
1.10	Heat exchanger coil MOC	Boiler tube BS: 3059 - seamless	
1.11	Heat exchanger coil shell	SA 515/516 Gr. 60/70	
1.12	Economiser MOC	Tube - BS 3059 Part-I ERW & Jacket – IS 2062	
1.13	Quality of steam	98 % Dry	
1.14	Fuel	Briquette/ Pellets	
1.16	NCV of Briquette fuel considered	Vendor to specify	
1.17	Thermal efficiency on NCV basis (%)	Vendor to specify	
1.18	Fuel consumption at maximum outlet- Briquette	Vendor to specify	
1.20	Heater surface area (m <sup>2</sup> )	Vendor to specify	
1.21	Heater coil design temperature (°C)	Vendor to specify	
1.22	Heater coil design pressure (kg/cm <sup>2</sup> )	Vendor to specify	
1.23	Heater coil test pressure (kg/cm <sup>2</sup> )	Vendor to specify	
1.24	Fuel consumption at maximum output	Vendor to specify	
1.25	Electric supply	AC, 3 Phase, 415 +/- 5% V, 50+/-3% HZ	
1.26	Total connected load	Vendor to specify	
1.27	Insulation of Heat exchanger(By supplier)	mineral wool	
1.29	Length (mm)	Vendor to specify	
1.30	Wiedth (mm)	Vendor to specify	

1.31	Height (mm)	Vendor to specify	
1.32	Shipping weight (kg)	Vendor to specify	
1.33	Operating weight (kg)	Vendor to specify	
1.34	Flue gas duct dia (mm)	Vendor to specify	
1.35	Chimney diameter (mm)	Vendor to specify	
1.36	Chimney height (mm)	Vendor to specify	
1.37	Chimney of boiler (Scope)	By supplier	
1.38	De-aerator capacity	20 kL	
<b>2</b>	<b>Panel</b>		
2.1	Type	MCC and PLC panel with SCADA	
2.2	Cable Entry	Vendor to specify	
2.3	MOC of Body	Vendor to specify	
2.4	Weight in Kg	Vendor to specify	
2.5	Power supply	AC, 3 Phase, 415 +/- 5% V, 50+/-3% HZ	
2.6	Power cabling from panel to boiler	By supplier	
2.7	Controlling cabling from panel to boiler	By supplier	
2.8	Cable tray for cabling	By supplier	
2.9	LXWXH (MM)	Vendor to specify	
2.10	Painting	Panel Shall Be Degreased, De-rusted & Powder Coated	
2.11	Busbar	Aluminum	
2.12	Paint shade for interior and exterior	Siemens Grey RAL 7032	
2.13	Paint shade for base plate	EL Orange RAL 2000	
<b>3</b>	<b>Boiler feed pump</b>		
3.1	Make	Vendor to specify	
3.2	Model no.	Vendor to specify	
3.3	Flow rate (m3/hr)	Vendor to specify	
3.4	Head (mtr)	Vendor to specify	
3.5	Power consumption (kW)	Vendor to specify	
3.6	Motor rating(kW)	Vendor to specify	
3.7	Companion flanges	Yes	
3.8	Feed water temperature	Vendor to specify	
3.9	Type of pump	Vendor to specify	
3.10	Method of cooling	Vendor to specify	
3.11	Casing MOC	Vendor to specify	
3.12	Impeller MOC	Vendor to specify	
3.13	Impeller speed	Vendor to specify	
3.14	Efficiency	Vendor to specify	
3.15	NPSH(R)	Vendor to specify	
<b>4</b>	<b>FD Fan (Primary)</b>		
4.1	Type of fan	Vendor to specify	
4.2	Make	Vendor to specify	
4.3	Model	Vendor to specify	

4.4	Capacity	Vendor to specify	
4.5	Static pressure	Vendor to specify	
4.6	Motor rating selected	Vendor to specify	
<b>5</b>	<b>FD Fan (Secondary)</b>		
5.1	Type of fan	Vendor to specify	
5.2	Make	Vendor to specify	
5.3	Model	Vendor to specify	
5.4	Capacity	Vendor to specify	
5.5	Static pressure	Vendor to specify	
5.6	Motor rating selected	Vendor to specify	
<b>6</b>	<b>ID Fan</b>		
6.1	Type of fan	Vendor to specify	
6.2	Make	Vendor to specify	
6.3	Model	Vendor to specify	
6.4	Capacity	Vendor to specify	
6.5	Static pressure	Vendor to specify	
6.6	Capacity control	VFD	
6.7	Motor rating selected	Vendor to specify	
<b>7</b>	<b>Total Connected Load List</b>		
7.1	Feed Water Pump	kW	
7.2	Forced Draft Fan	kW	
7.3	Secondary Forced Draft Fan	kW	
7.4	Induced Draft Fan	kW	
7.5	Screw Feeder	kW	
7.6	Control Panel	kW	
7.7	Reciprocating Grate	kW	
7.8	Fuel Handling System	kW	
7.8.1	Belt conveyor	kW	
7.8.2	Vibro screen	kW	
7.8.3	Crusher	kW	
7.8.4	Product Bucket Elevator	kW	
7.8.5	Live bottom silo screw	kW	
7.8.6	Submerged bed ash handling	kW	
<b>8</b>	<b>Safety valves</b>		
8.1	Size	Vendor to specify	
8.2	Number	Vendor to specify	
8.3	Type	Vendor to specify	
8.4	MOC of Body	Vendor to specify	
8.5	PN Rating	Vendor to specify	
8.6	Make	Vendor to specify	
8.7	End connection	Vendor to specify	
<b>9</b>	<b>Isolation valve</b>		
9.1	Size	Vendor to specify	
9.2	Number	Vendor to specify	
9.3	Type	Vendor to specify	
9.4	MOC of Body	Vendor to specify	

9.5	PN Rating	Vendor to specify	
9.6	Make	Vendor to specify	
9.7	End connection	Vendor to specify	

<b>TECHNICAL SPECIFICATION FOR 1 TPH STEAM BOILER</b>			
<b>Sr. No.</b>	<b>Description</b>	<b>Client Requirement</b>	<b>Tenderer Name With Contact Details (Below Details Confirmation / Specification by Tenderer)</b>
<b>1</b>	<b>Boiler</b>		
1.1	Make	Vendor to specify	
1.2	Model no	Vendor to specify	
1.3	Steam Output F & A 100 °C	1 TPH	
1.4	Steam outlet pressure	8 kg/cm <sup>2</sup>	
1.5	Steam outlet temperature	Saturated @ operating pressure	
1.6	Pollution control equipment	Multi cyclone dust collector	
1.7	Type of Combustor	Stationary grate	
1.8	No. of passes	vendor to confirm	
1.9	Design code	IBR-1950 with latest amendment	
1.10	Heat exchanger coil MOC	Boiler tube BS: 3059 - seamless	
1.11	Heat exchanger shell MOC	SA 515/516 Gr. 60/70	
1.12	Total connected load	Vendor to specify	
1.13	Quality of steam	98 % Dry	
1.14	Fuel	Briquette/ Pellets	
1.15	NCV of Briquette fuel considered	Vendor to specify	
1.16	Thermal efficiency on NCV basis (%)	Vendor to specify	
1.17	Fuel consumption at maximum outlet- Briquette	Vendor to specify	
1.18	APH Shell MOC	Vendor to specify	
1.19	APH Tube MOC	Vendor to specify	
1.20	Heater surface area (m <sup>2</sup> )	Vendor to specify	
1.21	Heater coil design temperature (°C)	Vendor to specify	
1.22	Heater coil design pressure (kg/cm <sup>2</sup> )	Vendor to specify	
1.23	Heater coil test pressure (kg/cm <sup>2</sup> )	Vendor to specify	
1.24	Fuel consumption at maximum output	Vendor to specify	
1.25	Electric supply	AC, 3 Phase, 415 +/- 5% V, 50+/-3% HZ	
1.26	Total connected load	Vendor to specify	

1.27	Insulation of Heat exchanger (By supplier)	mineral wool	
1.29	Length (mm)	Vendor to specify	
1.30	Width (mm)	Vendor to specify	
1.31	Height (mm)	Vendor to specify	
1.32	Shipping weight (kg)	Vendor to specify	
1.33	Operating weight (kg)	Vendor to specify	
1.34	Flue gas duct dia (mm)	Vendor to specify	
<b>2</b>	<b>Panel</b>		
2.1	Type	MCC	
2.2	Cable Entry	Vendor to specify	
2.3	MOC of Body	Vendor to specify	
2.4	Weight in Kg	Vendor to specify	
2.5	Power supply	AC, 3 Phase, 415 +/- 5% V, 50+/-3% HZ	
2.6	Power cabling from panel to boiler	By supplier	
2.7	Controlling cabling from panel to boiler	By supplier	
2.8	Cable tray for cabling	By supplier	
2.9	LXWXH (MM)	Vendor to specify	
2.10	Painting	Panel Shall Be Degreased, De-rusted & Powder Coated	
2.11	Busbar	Aluminum	
2.12	Paint shade for interior and exterior	Siemens Grey RAL 7032	
2.13	Paint shade for base plate	EL Orange RAL 2000	
<b>3</b>	<b>Boiler feed pump</b>		
3.1	Make	Vendor to specify	
3.2	Model no.	Vendor to specify	
3.3	Flow rate (m3/hr)	Vendor to specify	
3.4	Head (mtr)	Vendor to specify	
3.5	Power consumption (kW)	Vendor to specify	
3.6	Motor rating(kW)	Vendor to specify	
3.7	Companion flanges	Yes	
3.8	feed water temperature	Vendor to specify	
3.9	Type of pump	Vendor to specify	
3.10	Method of cooling	Vendor to specify	
3.11	Casing MOC	Vendor to specify	
3.12	Impeller MOC	Vendor to specify	
3.13	Impeller speed	Vendor to specify	
3.14	Efficiency	Vendor to specify	
3.15	NPSH(R)	Vendor to specify	
<b>4</b>	<b>ID Fan</b>		
4.1	Type of fan	Vendor to specify	
4.2	Make	Vendor to specify	
4.3	Model	Vendor to specify	
4.4	Capacity	Vendor to specify	
4.5	Static pressure	Vendor to specify	

4.6	Motor rating selected	Vendor to specify	
<b>5</b>	<b>FD Fan</b>		
5.1	Type of fan	Vendor to specify	
5.2	Make	Vendor to specify	
5.3	Model	Vendor to specify	
5.4	Capacity	Vendor to specify	
5.5	Static pressure	Vendor to specify	
5.6	Motor rating selected	Vendor to specify	
<b>6</b>	<b>Safety valves</b>		
6.1	Size	Vendor to specify	
6.2	Number	Vendor to specify	
6.3	Type	Vendor to specify	
6.4	MOC of Body	Vendor to specify	
6.5	PN Rating	Vendor to specify	
6.6	Make	Vendor to specify	
6.7	End connection	Vendor to specify	
<b>7</b>	<b>Isolation valve</b>		
7.1	Size	Vendor to specify	
7.2	Number	Vendor to specify	
7.3	Type	Vendor to specify	
7.4	MOC of Body	Vendor to specify	
7.5	PN Rating	Vendor to specify	
7.6	Make	Vendor to specify	
7.7	End connection	Vendor to specify	

## 2. MAKE OF BOUGHT OUT ITEMS

Feed water pump	Wilo / Grundfoss/ KSB /Xylem
Pressure gauges	Forbes Marshall/ Fiebeg
Electrical switch gears	Siemens/ L&T/ ABB/ Schneider
Cables	Polycab / Finolex
MCB	Siemens / L&T
Pressure switches	Indfoss
Water Level indicator	Teleflo / Tectrol / Leader
Main steam stop valve & Isolation valve	Forbes Marshall /Uniklinger
Steam and Water valves	Forbes Marshall / Uniklinger / Thermax
Safety valve	Forbes Marshall / Uniklinger
Blow down valve	Levcon / Leader
Non-Return valve	Spirax Marshall / Leader
Pipes	TATA/JINDAL



### 3. SCOPE OF SUPPLY

<b>11 TPH</b>	
<p><b>Solid fuel fired package boiler</b> complete with all accessories specified such as Pressure part, Reciprocating grate assembly, FD fan, ID fan, Economizer, boiler mountings, motors, starters, etc. Foundation bolts for all items (Hilti make) Chinese make Reciprocating grate are not accepted.</p>	By supplier
Two nos <b>feed water pump</b> of adequate capacity and rating complete with motor, stators etc., (1W + 1 S)	By supplier
<p><b>Fuel handling system with</b></p> <ul style="list-style-type: none"> <li>- Grizzly hopper- 1 No.</li> <li>- Vibro Feeder- 1 No.</li> <li>- Belt conveyor- 1 No.</li> <li>- Suspended magnet- 1 No.</li> <li>- Vibro screen- 1 No.</li> <li>- Fuel crusher- suitable for briquette- 1 No.</li> <li>- Bucket elevator- 1 No.</li> <li>- Live bottom silo- 1 No.</li> <li>- De-dusting system for crusher area and bucket elevator- 1 No.</li> </ul>	By supplier
<p><b>Pollution Control Equipment - Electro Static Precipitator (ESP): SPM&lt; 50 mg/Nm<sup>3</sup> at full load condition.</b></p> <ul style="list-style-type: none"> <li>- Precipitator main Casing, Gas distribution screen with special perforated plates for proper distribution of gas;</li> <li>- Rigid frame emitting system;</li> <li>- Panel form of collecting electrode plates - Aerodynamically shaped;</li> <li>- MS Metallic Expansion joints at the inlet and outlet;</li> <li>- Hoppers, inlet and outlet funnel in MS, with access doors;</li> <li>- Purge Air purging arrangement;</li> <li>- Transformer - Rectifier sets with individual microprocessor based control panels with DC KV / MA meters, spark counter and time totalizer;</li> <li>- Auxiliary Control Panel for distribution of power to the auxiliaries of the ESP such as TR sets, Micro-tapper, Insulator and hopper heaters etc.;</li> <li>- Instrument Controls;</li> <li>- Rapping System - Top mounted rapping system, away from the flue gas stream, facilitating ON-LINE maintenance;</li> </ul> <p>All items shall be sent loose assembly to be done at site.</p>	By supplier
<p><b>Pressurized Economizer consisting of:</b></p> <ul style="list-style-type: none"> <li>- Tube coil assembly</li> <li>- Inlet &amp; outlet headers</li> <li>- Casing with stiffeners</li> <li>- Access doors assemblies</li> <li>- Coil support</li> <li>- Bypass line in flue gas side</li> <li>- Air operated soot Blower Assembly for Economizer</li> </ul>	By supplier

<p><b>PLC based control panel with SCADA</b>  Free standing type, conforming to IP 42 degree of protection. The panel shall be made from 14/16 SWG CRCA sheets.  Control section consisting of;  - Microprocessor of S7 / Equivalent series of Siemens/ Allen Bradley make in non-redundant configuration  - Digital &amp; Analogue Input / Output cards with 10% spares;  - 21" commercial grade PC for SCADA  <b>Note:</b> Programming s/w can be supplied at extra cost.</p>	By supplier
<p><b>Non-Compartmentalized Power panel</b>  Free standing type, conforming to IP 42 degree of protection. The panel shall be made from 14/16 SWG CRCA sheets. Each feeder shall be placed in different compartment with lockable door.  Power section consisting of;  - Incomer  - Feeders for Fan, Pump, fuel feeders supplied by Thermax  - Feeders for FHP &amp; AHP  - On/Off Indication Lamps for the Drives;  - On/Off switches for the drives / feeders;</p>	By supplier
<p><b>Induced Draft (ID) Fan Assembly:</b>  - Centrifugal fan along with coupling, coupling guard, base frame, motor, VFD, belt drive and pulley assembly.</p>	By supplier
<p><b>Forced Draft (ID) Fan Assembly:</b>  - Centrifugal fan along with coupling, coupling guard, base frame, motor, belt drive and pulley assembly.</p>	By supplier
<p><b>1 TPH</b></p>	
<p>Pressure part consisting of Boiler shell with smoke tubes, reversal chamber, smoke chamber and observation/cleaning connections, Integral furnace with Fire door, stationary grate, refractory and ash collection chamber with access door.</p>	By supplier
<p>Two nos. <b>feed water pump</b> of adequate capacity and rating complete with motor, stators etc., (1W + 1 S)</p>	By supplier
<p><b>Induced Draft (ID) Fan Assembly:</b>  - Centrifugal fan along with coupling, coupling guard, base frame, motor, VFD, belt drive and pulley assembly.</p>	By supplier
<p><b>Forced Draft (ID) Fan Assembly:</b>  - Centrifugal fan along with coupling, coupling guard, base frame, motor, belt drive and pulley assembly.</p>	By supplier
<p><b>Air preheater</b></p>	By supplier
<p><b>BOP</b></p>	By supplier
<p><b>De-aerator cum storage tank (Common for both boiler)</b>  Pressurized De-aerator assembly of suitable de-aeration capacity along with valves and fittings (IBR):  Water temperature at the outlet of De-aerator: 105deg C,  Operating pressure: 0.25 kg/cm<sup>2</sup>(g)  - Storage tank volume: 20 kl  - Valves and Mountings  - Instruments  - Saddle support</p>	By supplier

<b>De-aerator Level Control</b> - De aerator tank Level Transmitter - Level Indicating control - Control Valve - I/P converter for control valve <b>De-aerator Pressure Control</b> - De aerator tank Pressure Transmitter - Pressure Indicating control - Control Valve - I/P converter for control valve <b>Pressure reducing station for feed water heating.</b>	
<b>Self-supported chimney</b> Self-supported chimney (designed as per IS 6533) with base plate, bolts, nuts, gusset plate, one sampling port, Aluminum earthing strip, one lightning arrestor, one aviation lamp with electrical cable up to bottom, painters pulley, platform at various stages with cage ladder Chimney MOC - IS 2062 / Mild Steel	By supplier
Details of valves & instrumentation to be provided in technical offer	By supplier
Inter connecting piping, fittings etc. for boiler room	By supplier
Flue gas and combustion air ducting	By supplier
Inter connected power & control wiring.	By supplier
Items required for installation, commissioning & startup of boiler	By supplier
Accessories -List to be provided	By supplier
Mountings & Fittings - List to be provided	By supplier
Drawings and Test certificates - After placement of P.O. and at the time of commissioning conformation to be provided.	By supplier

#### 4. SERVICES

Supervision of Erection & Commissioning.	By supplier
IBR Approval of boiler up to provisional firing order.	By supplier
All IBR formalities at site and its registration and expenses involved thereof To be quoted separately.	By supplier
Registration fee will be paid by end User	

#### 5. GUARANTEES

The boiler should be guaranteed for trouble free operation for a period of 1 year from the date of handing over.	By supplier
Performance guarantee runs should be conducted as per BS 845 part1 -1987 indirect test method after one month of continuous trouble-free operation	By supplier
Any defect due to faulty material / bad workmanship should be rectified free of cost to the entire satisfaction of the purchaser.	By supplier

#### 6. CONTROLS AND SAFETIES PER BOILER

Pressure switch	For firing positions of burner
Sequence controller	To control sequence of firing, pre-purging, etc.,
Water level controller	To regulate feed water pump operation and trip burner in case of low level with audio visual alarm

#### 7. SAFETY INTERLOCKS PER BOLIER

Unsafe condition	Action
High water level	Feed pump trip
Low water level	Alarm & burner shut down

Extra low water level	Alarm & lock-out
Flame failure	Alarm & burner trip
Boiler high pressure	Lift & discharge

### 8. ADDITIONAL SAFETY FEATURES PER BOILER

Fusible plugs	To Discharge high temperature
Peep hole for monitoring flame - Explosion door	To view
Low water level	Alarm & burner shut down

### 9. INSTRUMENTATION PER BOILER AS REQUIRED

Water level controllers	For feed water operation and low water level alarm
Over-ride controller	for lock-out under extra low water level alarm
Steam pressure gauge with cock	For display of boiler steam pressure
Water level gauge assembly	For display of water level in the boiler
Switch gears, relays, connectors	For individual controls of equipment through control panel
Audio / visual alarm	In case of unsafe operation for lock-out under extreme conditions
Control panel	For housing above instruments and switch gears
Steam to fuel ratio monitoring system	To monitor and display the boiler efficiency on-line, using necessary meters, instrumentation and hardware

### 10. BATTERY LIMITS -SUGGESTED

- 10.1 Steam: -Up to main steam header with 2 inlet, Steam trap, Air vent, Steam outlet and 2 spares.  
One inlet for 11 TPH boilers and other for 1 TPH boiler outlets (sizes to be confirmed)
- 10.2 Water: - From RO system outlet, as per layout, condensate at inlet of deaeration tank, control valve in bidder's scope.
- 10.3 Air: - At one point in boiler house
- 10.4 Blowdown: - At blowdown pit inlet
- 10.5 Ducting and Insulation: - Complete in bidder scope for boiler room
- 10.6 Flue gas: - At chimney outlet, chimney in bidder's scope
- 10.7 Power: - Incomer feeder to MCC panel shall be provided by customer.
- 10.8 Transportation: - Bidder scope
- 10.9 All vents and drain: - at one location outside boiler house

### 11. COMMON ITEMS FOR BOTH BOILER

- 11.1 Deaerator cum storage tank
- 11.2 Header (main steam)
- 11.3 Chimney

## **PART C. INSTALLATION, TESTING AND COMMISSIONING: -**

### **1. GENERAL**

This section covers the requirements for Installation, Testing and commissioning of various items of equipment for the Boiler units.

The successful Bidder shall select and adopt methods and procedures for equipment erection to suit the nature of equipment and erection work involved according to the best modern practice and his own experience in such work. The successful Bidder shall be solely responsible to provide competent and adequate supervision to ensure that assembly and erection work are in compliance with the equipment manufacturer's drawings and/or instructions. The bidder shall not make any alteration to equipment to facilitate assembly for erection work, without prior agreement of the equipment Supplier and final approval of the Purchaser.

All assembly and erection procedures adopted by the successful Bidder shall be open for inspection and approval by the Purchaser. Acceptance of assembly or erection procedures shall not in any way relieve the Bidder of his responsibility for proper erection of the equipment.

### **2. SCOPE OF WORK**

The successful Bidder shall be required to erect all mechanical and electrical equipment including cable trays (without cable) and earthing, steelwork, piping, ducting, instruments etc. complete in all respects up to the stage of commissioning in accordance with the

Contract and as per relevant drawings and erection instructions of the equipment manufacturer.

The successful Bidder shall provide all skilled, semiskilled and unskilled labour including riggers, certified welders, pipe fitters, instrument tube fitters, licensed electricians, licensed cable jointers, mechanics, supervisory staff, etc. Tools and tackles, consumable and erection materials, hoisting, transporting, erection and testing equipment and instruments and all other related equipment required for complete erection and commissioning of all equipment with auxiliaries and accessories. The work shall include but not be limited to the following:

- Receipt at site of all equipment covered under this contract.
- Opening of crates and packing cases, thorough cleaning and checking of completeness of equipment.
- Providing storage and safe custody of the equipment etc at site till such time these are erected, tested and commissioned and handed over to the Purchaser.
- Providing proper handling and transport equipment, namely cranes, winches, derricks, slings, pulley blocks etc.
- Checking of centrelines, levels, positions and plumbs of all equipment bolts and pockets of all equipment foundations on which the equipment shall be installed.
- Complete assembly and erection of all equipment, pipework, ductwork, motors, local push-button station, cables, cable trays, and earthing, refractory work, bricklaying work, structural steelwork etc. including fabrication and erection of miscellaneous structural steelwork.
- Provide required safety approval for erection men, fire-fighting facilities, keeping the place clean and hand over in tidy condition after completion of work.

- General clean up prior to preparing the equipment for trial run and start-up.
- Conducting trial runs, start-up and Commissioning of the equipment as per equipment manufacturer's instructions.
- Supply of all required spares consumables for erection and commissioning of boiler till safety valve floating.
- Supply of required number of target plates for qualifying the steam quality.

### **3. INSTALLATION OF INSTRUMENTATION AND CONTROL SYSTEMS**

The erection of instruments and controls shall consist of installation of all site mounted and panel mounted instruments and control equipment, instrument piping, cabling etc complete in all respects up to the stage of commissioning in accordance with the contract and as per relevant drawings and erection instructions of the equipment manufacturers.

Testing: -

Testing shall be carried out after the installation of instrument with instrument piping and cabling complete in all respects and approved by Purchaser.

Calibrations: -

All the instruments included in successful Bidder's scope of supply shall be calibrated strictly as per manufacturer's instructions and in-coordination with equipment supplier prior to installation.

### **4. STARTUP, COMMISSIONING AND ACCEPTANCE**

The successful Bidder shall provide necessary equipment, tools, tackles, instruments, labour supervision etc for start-up, commissioning and performance tests.

The successful Bidder shall provide adequate personnel as required for starting-up and commissioning of equipment as well as adjustments, repair and rectification of defects in erection of the equipment, during commissioning of the equipment.

Till the equipment are finally accepted by the Purchaser and taken over after the successful commissioning, the successful Bidder shall be responsible for any loss/damage/theft etc for the equipment erected by him.

The successful Bidder shall maintain a skeleton staff at the site after commissioning for any additional/modification work as may be required by the Purchaser.

### **5. TESTS AND PRE-COMMISSIONING**

A detailed pre-commissioning and commissioning tests procedure shall be prepared for the following considering the input condition and specified raw materials. These procedures shall be followed meticulously for conducting the pre-commissioning and commissioning tests in the presence of Purchaser. Check lists shall be signed by the Purchaser's supervising engineer

### **6. PRE-COMMISSIONING AND COMMISSIONING ACTIVITIES**

Pre-commissioning and commissioning activities of steam generator shall include but not limited to the Following:

- Cleaning and inspection of Boiler internals.
- Flushing with air and water as applicable.
- Pneumatic or hydraulic tests.

- Leak check for internal leaks for valves, external leaks for equipment, inter-space leaks for heat Exchangers.
- Run tests of fans pumps and other drives.
- Chemical boiling and cleaning of pressure parts.
- Checks on electrics for completeness and simulation test.
- Checks on instrumentation and control.
- Blowing out of steam system.
- Protection checks on steam generator and its auxiliaries.
- Calibration of all instruments and control devices.
- Verification of interlocks.
- Operation of steam generation on combinations of fuel.
- Relief valves floating.
- Operation of valves and non-return valves.

### **Special Tests**

Following tests shall be conducted on all piping, equipment and on complete system wherever possible whether it is specified or not in the relevant sections:

- Pressure testing.
- Steam blowing.

### **Electrical System**

The successful Bidder shall carry out pre-commissioning tests/checks on electrical equipment in the presence of Purchaser or his authorized representative. A list of such tests and checks shall be submitted by the Bidder along with the offer. The list shall be finalized with the successful Bidder on award of contract.

Testing and commissioning work shall be carried out as per approved standards.

All test results shall be entered in proper proforma and submitted by the successful bidder to Electrical Inspectorate for approval. The test results shall be certified by the engineer having valid electrical license issued by the State Government of Gujarat. Before submitting to the Electrical Inspectorate. All the test certificates, in three copies, shall be submitted to the Purchaser duly signed by the Engineer at site for his reference.

#### **Testing**

Testing shall be carried out after the installation of instrument with instrument piping and cabling complete in all respects and approved by Purchaser.

#### **Calibrations**

All the instruments included in bidder's scope of supply shall be calibrated strictly as per manufacturer's instructions and in-coordination with equipment supplier prior to installation.

Panel switchgear selection shall be as per type 2 Co-ordination chart.

## **7. PERFORMANCE GUARANTEE TESTS**

All the pressure parts shall be covered by a warranty period of two (2) years from date of commissioning for workmanship and selection of material. All equipment other than pressure parts shall be covered by a warranty period of one (1) year from date of commissioning for workmanship & selection of materials. All the equipment shall be guaranteed for satisfactory performance. The guarantee for performance shall cover individual items and systems including electrics for their ratings/outputs, as required in the specification.

The manufacturer shall conduct performance/ acceptance tests on each of the major items of equipment supplied, to demonstrate that the equipment supplied is capable of achieving the performance parameters specified and contracted. Instruments, gauges and flow meters

installed for the normal operation of the equipment shall be made use of during the acceptance tests as far as practicable.

The guarantee tests and tolerances permissible shall be in accordance with the relevant Indian Standards / ASME PTC 4.01. Where Indian Standards are not available, the same shall be in accordance with International Standards, which shall be acceptable to the Purchaser. The Bidder shall clearly indicate in his offer the standard to be adopted for guarantee tests.

The Bidder shall also furnish as part of his offer correction curves applicable in case the specified operating conditions are different from the operating conditions during the guarantee tests. Should the tests specified show that the unit has failed to achieve the guaranteed parameters, the supplier shall carry out modifications if considered necessary to meet the guaranteed figures and the guarantee tests shall be repeated.

If the specified guarantees are not established within 90 days, the Purchaser shall have the option either to reject the equipment or accept the equipment with such liquidated damages as are mutually accepted. The manufacturer shall mention in his offer the liquidated damages that he is willing to pay in case of the nonachievement of the various performance parameters guaranteed.

## **8. DRAWINGS AND DOCUMENTS**

The successful Bidder shall submit the following drawings/documents during execution of the contract for each plant:

Preparation and submission of all drawings and documents etc.

Submission of information, drawings and specifications for items that may be fabricated / Supplied by others.

Preparation and submission of comprehensive operation and maintenance manuals for all the equipment supplied.

Submission of records/documentation pertaining to erection, testing, start-up and putting into commission including performance tests of all materials and equipment supplied by the successful Bidder, as well as those that may be procured/fabricated by others based on the successful Bidder's drawings, specifications and bill of materials. This will include documents for obtaining necessary certificate/clearance from statutory authorities such as Boilers Inspectorate, electrical inspectorate, etc.

Furnishing details of auxiliaries which, though not a part of successful Bidder's scope of work but are essential for safe and efficient working of the plant in terms of the contract. Preparation and submission of schematic drawings, cable routing drawings including cable Schedule, P&I Diagram.

## **9. DEVIATION LIST:-**

To be provided by bidder

## **10. ANNEX A: - Room Layout**

**ANNEX B: - Steam system schematic diagram**