

## ANNEXURE-VIII

### **1.0 BIDDER'S SCOPE OF SUPPLY AND SERVICES**

#### **1.1 SCOPE OF SUPPLY**

Bidder's scope of supply shall **include all Workshop items (MECH) as listed clause No.6**, including all equipment, items and materials as covered in attached specifications and documents, to make the unit complete and operable. All equipment/machinery under this MR shall be new, unused and of sturdy design.

#### **1.2 GENERAL**

The equipment/system supplied shall be complete in every respect, ready for installation and operation. It is not intent of purchaser to specify every piece of equipment / item , therefore any item not specified mentioned in this specification but required as per good engineering practice and safe and trouble free operation of the system shall be deemed to have been specified by the purchaser and shall be included in bidder's scope of work/supply.

Please note that this is a "Zero Deviation" bid. Hence any deviation to the bid specification is not acceptable. Bidder to submit all their clarification/deviation (if any) through email addressed to: [siva@rfcl.co.in](mailto:siva@rfcl.co.in) & [sprakash@rfcl.co.in](mailto:sprakash@rfcl.co.in) only. Bidder to refer Special Instruction to Bidder, Doc. No. (A747-311-80-42-SI-4100)

#### **1.3 SCOPE OF SERVICES**

- i) Design, engineering and selection of the equipment.
- ii) Procurement of raw materials and bought out items.
- iii) Manufacture, fabrication & assembly.
- iv) Inspection and testing as specified/ Manufacturer standard.
- v) Surface preparation, protective coating and painting including supply of paints required for touchup/ damaged painting at site.
- vi) Packing and supply.
- vii) Erection of all equipment, commissioning & required testing at site as per instruction of Engineer in charge /owner.
- viii) Bidder shall guarantee the equipment for performance strictly as per contract document. All instruments, tools/tackles, calibration items as required for performance testing shall be arranged by bidder at site. Bidder can take back all such instruments after handover of equipment to Owner.
- ix) Statutory approvals, if any, wherever required.
- x) The team of Owner's personnel to be trained at RFCL, Ramagundam site will comprise of persons from all disciplines of maintenance, operation and other associated departments. All required facilities for training at site shall be provided by Owner. However, all training materials shall be provided by the Vendor. Training shall comprise of :
  - a. 5(FIVE) days for the group of 5(FIVE) personnel for Mechanical Workshop Machineries for operation and maintenance/troubleshoot.



## JOB SPECIFICATION FOR WORKSHOP EQUIPMENT

- xi) Bidder shall host Inspection at their site for the Equipment / Item(s), (MECH) to be supplied by RFCL's representative. Inspection Report shall be issued by Inspecting Representative of RFCL.
- xii) Preparation and submission of drawings and documents for Workshop Equipment.

### 2.0 CODES AND STANDARDS

The main codes, standards, applicable to each equipment or system are indicated in the respective section. Other reference documents, as applicable, are also listed in these corresponding specifications wherein the requirements of various codes and standards are amended or supplemented for compliance by the Bidder.

### 3.0 SAFETY REQUIREMENTS

- a) It is the intent that operational hazards be reduced to a minimum. Bidder shall use sound engineering judgement to complete an installation that will perform the required function without compromising this aim.
- b) Electrical devices shall meet the requirements for the area classifications in which they are installed.
- c) Couplings, gears and exposed rotating parts shall be provided with adequate guards. For hazardous area installation, these guards shall be of non-sparking construction. Drive belts, if used, shall be antistatic type.
- d) Noise Level shall be limited to 85 dBA, unless otherwise specified.

### 4.0 EXCLUSION

- a) All items outside Bidder's Battery Limits.
- b) Supply of utilities such as water, power, air etc.

### 5.0 SPECIAL TOOLS AND TACKLES

The Bidder shall provide a set of new and unused special tools and tackles, if required, for day to day operation and maintenance of the offered equipment / system. Bidder shall include the price of the special tools and tackles, in base price, and furnish the list along with the bid.

### 6.0 TECHNICAL SPECIFICATIONS

#### EQUIPMENTS DETAILS:

#### 6.1 MECHANICAL WORKSHOP MACHINERIES

##### 6.1.1 Vertical Turret Lathe (Quantity- One)

- |                                       |   |
|---------------------------------------|---|
| 1. Table Diameter                     | Not less than 1500mm.   |
| 2. Maximum Swing diameter above       | Not less than 1750 mm.  |
| 3. No. of Tools in turret             | Not less than 10.   |
| 4. Required features                  | <ul style="list-style-type: none"> <li>● Radius turning upto 1200 mm Diameter.</li> <li>● External and Internal threading for Metric and British (Inch threads) threads.</li> <li>● Metric: 0.5 mm pitch to 6mm pitch.</li> <li>● BSW (inch thread): All standards size form 0.25 TPI to 60TPI.</li> <li>● Indexing drilling in different flange.</li> <li>● Multiple machining heads Ram head, side head and turret head.</li> </ul> |
| 5. Minimum accessories and attachment | <ul style="list-style-type: none"> <li>● Self – Centering table.</li> <li>● Four Jaws.</li> <li>● Coolant equipment.</li> <li>● Fine measuring facilities with automatic feed.</li> <li>● Crowning attachment.</li> <li>● Digital readout.</li> </ul>   |

**6.1.2 Heavy Duty Lathe**

**(Quantity- One)**

- |  |   |
|--|---|
| 1. Centre Height   | 500mm to 600mm .  |
| 2. Bed Length  | 5000mm to 6000mm.   |
| 3. Swing over cross slide                                      | Not less than 670mm.  |
| 4. Spindle bore  | Not less than 110mm.  |
| 5. Maximum weight of the job between centers without steadies  | Minimum 3.5 Tones.  |
| 6. Maximum weight of the job between centers with two steadies | Minimum 5.5 Tones.  |
| 7. Bed Type  | Removable bridge Type.  |
| 8. Attachment  | <ul style="list-style-type: none"> <li>● Taper turning.</li> <li>● Thread cutting of both metric and British threads (inch Threads).</li> <li>● Metric : 1 mm pitch to 6mm pitch.</li> <li>● BSW (inch thread) : All standards size form 0.25 TPI to 60 TPI.</li> <li>● Multi start threading.</li> <li>● Taper Threading.</li> <li>● Internal and External Turning.</li> </ul> |

**9. Standard Accessories  
 (Minimum)**

1. Gap bed with bridge piece in lieu of standard bed.
2. One set 3 jaw self-centering chuck with one set of hardened jaws reversible for internal and external chucking.
3. One precision face Plate.
4. Swarf tray and coolant equipment.
5. Splash guard.
6. Machine lamp 24V with bulb.
7. Two Steady rest.
8. One Follow rest.
9. Special tool kit consisting of turning tools, partial Tools, external threading tool with a set Corresponding inserts.
10. Rear tool holder.
11. Tool post grinder for internal and external grinding.
12. Longitudinal stop.
13. Taper turning attachment.
14. 4 Jaw Independent Chuck with one set of hardened jaws reversible for internal and external chucking (Min. clamping dia: 25 mm) .
15. Support roller guide ways set( 2 pcs) for bigger dia
16. Radius turning

**6.1.3 High speed Medium Duty Precision lathe (Quantity - One)**

- |   |                                   |   |
|---|-----------------------------------|---|
| 1 | Centre Height                     | 260mm.  |
| 2 | Bed length                        | 2000mm.   |
| 3 | Bed Type                          | Removable bridge Type.  |
| 4 | Attachment                        | <ul style="list-style-type: none"> <li>● Taper turning.</li> <li>● Thread cutting of both metric and British thread (inch Threads).</li> <li>● Metric: 0.5 mm pitch to 6mm pitch.</li> <li>● BSW (inch thread): All standard size form 0.25 TPI to 60TPI.</li> <li>● Multi start threading.</li> <li>● Taper Threading.</li> <li>● Internal and External Turning.</li> <li>● Radius Turning.</li> </ul> |
| 5 | Standard Accessories<br>(Minimum) | 1. Gap bed with bridge piece in lieu of standard bed.   |

2. One set 3 jaw self-centering chuck with one set Of hardened jaws reversible for internal and External chucking.
3. One Precision face Plate.
4. One Universal face Plate.
5. Swart tray and coolant equipment.
6. Splash Guard.
7. Machine lamp 24V with bulb.
8. Two steady rest.
9. One Follow rest.
10. Special tool kit consisting of turning tools, parting tool, external threading tool with a set of Corresponding inserts.
11. Rear tool holder.
12. Tool post grinder for internal and external grinding.
13. Longitudinal stop.
14. Taper turning attachment.
15. 4 Jaw Independent Chuck with one set of Hardened jaws reversible for internal and external Chucking (Minimum clamping dia : 14mm)
16. Radius turning
17. Quick change tool post

**6.1.4 High speed Light Duty Precision Lathe (Quantity - One)**

- |   |                                |  |
|---|--------------------------------|--|
| 1 | Centre Height                  | 220mm.   |
| 2 | Bed Length                     | 1500mm.  |
| 3 | Bed Type                       | Fixed.   |
| 4 | Attachment                     | <ul style="list-style-type: none"> <li>● Taper turning.</li> <li>● Thread Cutting of both metric and British Threads (inch Threads).</li> <li>● Metric: 0.5 mm pitch to 6 mm pitch.</li> <li>● BSW (inch threads): All standard size Form to 60 TPI Multi start threading.</li> <li>● Taper Threading.</li> <li>● Internal and External Turning.</li> <li>● Radius Turning.</li> </ul> |
| 5 | Standard Accessories (Minimum) | <ol style="list-style-type: none"> <li>1. Gap bed with bridge piece in lieu of standard bed .</li> <li>2. One set 3 jaw self-centering chuck with one set of hardened jaws reversible for</li> </ol>   |

- internal and External chucking.
- 3. One Precision face Plate.
- 4. Radius turning.
- 5. Swart tray and coolant equipment.
- 6. Splash Guard.
- 7. Machine lamp 24V with bulb.
- 8. Two steady rest.
- 9. One Follow rest
- 10. Special tool kit consisting of turning tools, Parting tool, external threading tool with a set of Corresponding inserts.
- 11. Rear tool holder.
- 12. Tool post grinder for internal and external grinding.
- 13. Quick change tool post.
- 14. Taper turning attachment.
- 15. 4 Jaw Independent Chuck with one set of hardened jaws reversible for internal and external Chucking (Minimum clamping dia: 14mm).

**6.1.5 Universal Radial Drilling Machine (Quantity- One)**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1 Maximum drilling Capacity in Steel</li> <li>2 Maximum Drilling capacity in Cast Iron</li> <li>3 Speed</li> <li>4 Feed</li> <li>5 Arm movement</li> <li>6 Maximum Drilling Radius</li> <li>7 Minimum Features</li> <li>8 Attachment</li> </ul> | <ul style="list-style-type: none"> <li>70mm to 80mm .</li> <li>80mm to 90mm.</li> <li>Variable.</li> <li>Variable.</li> <li>Not less than 300 degrees.</li> <li>Not less than 2300mm .</li> <li>1. Ergonomically grouped controls for operating convenience.</li> <li>2. Light cantering of spindle.</li> <li>3. Precise depth release.</li> <li>4. Electrohydraulic clamping provided for drill head, arm and sleeve.</li> <li>5. shock-free engagement of taps through clutch and spindle reverse for withdrawals.</li> <li>1. Normal working table.</li> <li>2. Tilting type working table.</li> </ul> |
|--|---|

**6.1.6 Surface Grinding Machine (Quantity- One)**

1	Working Surface	250mmX1000mm.
2	Minimum work height	330mm.
3	Maximum job weight on the Table	Not less than 180Kg.
4	Size of Magnetic Chuck	20mmX1000mm.
5	Maximum traverse limit Longitudinal	630mm.
6	Maximum traverse limit Cross	280mm.
7	Maximum traverse limit Vertical	360mm.

**6.1.7 Plate Shearing Machine**

**(Quantity- One)**

1	Nominal cutting capacity and accuracy Mild steel plate having UTS of~440N/sq. mm	12mm or more.
2	Stainless Steel plate	10mm or more.
3	Job cutting width	3000mm or more.
4	Back gauge stroke length	1000mm or more.
5	Back Gauge accuracy	±0.2mm or better.
6	Square ness of cut plate	0.5mm/meter, or better
7	Squaring and support arm	1No. Heavy duty squaring and supporting arm of length 1000mm or more shall be fitted at the left hand side of the machine bed. It shall have a wide stainless steel scale fitted on it with zero reference from blade cutting edge.  Two additional front supporting arm of lenth~1000mm or more with roller bearing mounted.
8	Table Type	Ball transfer mounted for assisting the Movement Of heavy plates.
9	Blades	Both ram & bed blades shall have four side Cutting Edges. Both ram and bed blades will be Interchangeable. Blade material shall be HCHCr/D2 & minimum hardness shall be 55 HRC.
10	Strokes	5 strokes or more/ minute .

11	Hydraulic hold down clamps for plate/sheet	Minimum 14 nos.
12	Cutting angle range	0.5 to 3 degree or higher.
13	Blade clearance adjustment for cutting different thickness of plates	1mm to 12mm thick or more.
14	Other features	<p>Front side digital controller with back gauge Adjustments.</p> <p>Back gauge shall be operated on heavy duty Ball screws driven by AC servo motors and Fitted with absolute position encoders. The Encoders shall be protected from the job plate movements.</p>
15	Hydraulic Power pack	<p>Shall be of Re-circulating Type. Hydraulic tank should be preferably placed at shop floor.</p> <p>No leakage or spillage will be Tolerable.</p>
16	NC Controller	with all necessary software Packages for cutting of plates in different lengths.
17	Operator's Panel	Operator's Panel will be in front of the machine With all necessary control and display for the Operation of the machine of size five inch or more.
18	Safety features	<p>i). Two no. Emergency stop Push button to be provided one on operator panel side &amp; other At another end of machine.</p> <p>ii). Operator's hand safety guard shall be provided before the plate hold down plungers.</p>

### 6.1.8 Plate Bending Machine

**(Quantity- One)**

1	Type (No of Rollers)	Three roller type plate bending Machine.
2	Maximum thickness to be rolled	20mm.
3	Minimum width to be rolled	2500mm.
4	Type of Roller	Roller should be with hardened surface.
5	Top roller dia	250mm.
6	Movement of bottom rollers	Mechanical/Hydraulic.



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|---|---------------|--|
| 7 | Control panel | Movable type with atleast 6m cable.                            |
| 8 | Safety system | All necessary safety system like trip against overloading etc. |

**6.1.9 Universal Horizontal Milling Machine (Quantity One)**

- |    |                                    |  |
|----|------------------------------------|--|
| 1  | Table length                       | 200- 2500 mm.  |
| 2  | Table Width                        | 300 - 350 mm.  |
| 3  | Minimum Table swivel for Both side | 45 degree .  |
| 4  | Longitudinal                       | 1000-1100 mm.  |
| 5  | Table Travel                       |  |
| 6  | longitudinal                       | 1000-1100 mm.  |
| 7  | Transverse                         | 300-350mm.   |
| 8  | Vertical                           | 400-450mm .  |
| 9  | Head type                          | Swivel and Tilt.   |
| 10 | Vertical swivels left to right     | 90 degrees .   |
| 11 | Minimum Spindle Speed              | Not More than 30RPM.   |
| 12 | Maximum Spindle Speed              | Not Less than 1800RPM.   |
| 13 | No. of Spindle Speed               | Not less than 18.  |
| 14 | Features                           | <ul style="list-style-type: none"> <li>● Spindle brake.</li> <li>● 3 axis simultaneous power feed with rapid traverse.</li> <li>● Hardened and ground ways.</li> <li>● Autolub system.</li> <li>● Low voltage safety controls.</li> <li>● Pendant controls.</li> </ul>   |
| 15 | Other Attachment                   | <ul style="list-style-type: none"> <li>● Collet Adaptor of ISO-50.</li> <li>● Set of collets of sizes 5, 6, 8, 10, 12, 16, 20 ,25 , 32.</li> <li>● Universal dividing head with Chuck &amp; Tailstock.</li> <li>● Vice with and without swivel base with Jaw width 200mm Opening 175mm.</li> <li>● Hydraulic vice with jaw width 200mm and Opening 300mm .</li> <li>● Hand operated circular table of 400mm dia Without ind.</li> <li>● Long milling Arbor 22X500 for ISO50 &amp; short milling arbor</li> <li>● Long milling Arbor 27X500 for ISO 50 &amp; short milling arbor</li> <li>● Long milling Arbor 32X500 for ISO 50 &amp; short milling arbor <ul style="list-style-type: none"> <li>● Digital readout system for X,Y,Z axis.</li> <li>● High Intensity Machine Lamp.</li> <li>● High pressure Coolant system.</li> <li>● Machine Guards.</li> </ul> </li> </ul> |

**6.1.10 Cylindrical Grinder**

**(Quantity-One)**

- |                            |   |
|----------------------------|---|
| 1 Centre height            | Min. 225mm.   |
| 2 Swing over bed           | Min. 450mm .  |
| 3 Maximum Grinding dia.    | 250mm.  |
| 4 Distance between centers | Min. 1200mm.  |
| 5 Accessories              | <ul style="list-style-type: none"><li>● Machine Guard.</li><li>● Forced Coolant system.</li></ul> |

**6.1.11 Slotter (Slotting Machine)**

- |  |                     |
|--|---------------------|
| 1 Stroke                                   | Not less than 16” . |
| 2 Rotary Table dia.                        | Not less than 22” . |
| 3 Longitudinal movement                    | Not less than 18” . |
| 4 Cutting Speed of Ramper/ Min             | 15-45-65 .          |
| 5 Ram Adjustment                           | Required .          |
| 6 Distance from the Tool<br>to main center | Not less than 20”.  |

**7 INSPECTION AND TESTING**

- 7.1 Vendor shall perform tests and inspection necessary to ensure that the material and workmanship conform to the requirement of this specification and submit the Pre-delivery inspection report to RFCL before dispatching the equipment..

**8 PAINTING**

Painting shall be as per manufacturer recommend standard practice considering corrosive environment of fertilizer plants.

**9.0 PREPARATION FOR SHIPMENT AND PACKING**

- 9.1 The unit may be disassembled into major components suitable for shipment and shall be properly packed to provide adequate protection against mechanical damage and atmospheric corrosion during shipment and for outdoor storage at job site. All assemblies shall be properly match marked for site erection.
- 9.2 Open end of tubes shall be capped for protection.



## JOB SPECIFICATION FOR WORKSHOP EQUIPMENT

- 9.3 All flanged openings shall be protected with metal cover plates to prevent damage during shipment. Cover shall be a minimum of 6mm thick and shall be installed with a suitable gasket using a minimum of four full diameter bolts. The cover and flange shall be taped for waterproof protection.
- 9.4 Bracing, supports and rigging connections shall be provided to prevent damage during shipment, lifting and unloading.
- 9.5 Exposed finished and machined surfaces, including bolting shall be given a heavy coating of rust inhibition compound or grease. Internal metal surfaces shall be sprayed or coated with a suitable rust preventive, where required, and tagged at opening to so indicate.
- 9.6 Two complete sets of installation instructions shall be shipped with the equipment.
- 9.7 All tapped openings in process service shall be plugged with solid steel pipe plugs with 1 1/2" extension.
- 9.8 Solid steel pipe plugs shall be used instead of plastic plugs for any parts that is pressurized during start up or operation.
- 9.9 Loose assemblies, if unavoidable, shall be properly packed for transportation and outdoor storage of site. Storage instructions shall be boldly marked on consignment. Bidder shall supervise installation of loose assemblies at site. Details of shipping in respect of skid and loose assemblies shall be clearly defined in the commercial bid.

### **10. IDENTIFICATION**

Each major piece of equipment shall have a permanently attached stainless steel name plate giving salient equipment data, make, year of manufacture, equipment number etc.

### **11. SPARE PARTS**

#### **11.1 Commissioning Spares**

Bidder shall supply adequate quantity of commissioning spares so as to ensure that commissioning of the system is not hampered for shortage of commissioning spares. Bidder shall include the cost of the commissioning spares in the lump sum quoted price. If any spare, over and above the supplied commissioning spares is required during commissioning, the same shall be supplied by bidder without any price or time implication.

#### **11.2 Maintenance Spares**

Bidder shall furnish list of Maintenance spares for two (2) years normal operation and maintenance of the equipment with itemized price list along with the Bid, which shall be ordered by the owner separately.

### **12. DOCUMENTATION**

- 12.1 Foundation load data, drawings for package vendor's supplied items shall be provided within Six (6) weeks from date of award of job for Owner review.



## JOB SPECIFICATION FOR WORKSHOP EQUIPMENT

12.2 For list of other critical drawings/documents, refer NIT.