Ref: BTDG/WORKS/SKA/2020/MF/110726

Nov. 3rd, 2020

To,

Sub: Invitation of Quotations for Fabrication and supply of Vibration Isolated optical table and optical mounts.

DUE DATE: 18/11/2020

Dear Sirs,

1. Quotations are invited for the minor fabrication job as per the specifications and drawings.
2. Bidder shall quote for fabrication of these components with material.
3. Taxes and duties shall be quoted separately.
4. The quotations must reach Associate Director, Beam Technology Development Group by 18/11/2020 and must be sent in a sealed envelope super scribed with the above reference number and due date given above. Quotations should be sent through Indian post only.
5. The address on the envelope should read
   (Attn. Shri S. K. Agarwalla)
   To,
   Associate Director,
   Beam Technology Development Group
   Bhabha Atomic Research Centre
   Mumbai - 400 085

6. The supplier shall have to take an insurance policy against any material issued to him by the purchaser.
7. The fabrication work shall be subjected to inspection by our engineer post submission of supplier’s test reports. The finished components shall not be dispatched prior to approval by our engineer at supplier’s works. Necessary inspection facilities should be provided to our engineers during fabrication at supplier’s premises.
8. The supplier shall deliver the finished components after approval by our engineer within 12 weeks from the date of issue of the purchase order to the bidder.
9. Associate Director, BTGD, BARC reserves the right to accept or reject any or all quotations without assigning any reason.
10. For any further clarification Shri S. K. Agarwalla, L&PTD (Extn:-20213, email: sandeepk@barc.gov.in) may be contacted.

Yours faithfully,

[Signature]

Associate Director,
Beam Technology Development Group, BARC
Job specification

Technical specifications for Fabrication of vibration isolated optical table and optical Mounts

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Items</th>
<th>Qty (nos.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Vibration Isolated optical table top</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Vibration Isolation table support</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Transparent box for above table with doors</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>Rotatable stage</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>Beam steering mount</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>Mini optical Breadboard</td>
<td>2</td>
</tr>
</tbody>
</table>

Scope of Work

This job specification concerns the fabrication, and supply of vibration isolated optical table and optical Mounts. The vibration isolated optical table and optical mounts with the following specifications has to be fabricated and to be installed/assembled in the user’s lab to attain the desired parameters. The whole vibrations isolated table, its supports and optical mounts has to be fabricated and tested for the mentioned specifications.

Technical Specifications

1. Vibration Isolated Optical table top

The table top should be made of SS material. The surface finish should be precision machined with matte finish with 0.1mm flatness over 1m². The optical table should have sufficient stiffness and broadband damping for vibration isolation. Its corner should be rounded with large radius curvature for personal safety. The table top need to have M6 tapped holes matrix in 25x25 mm pitch. The required dimension of table top is:

1.1 Length (L): 1200 mm
1.2 Breadth (W): 1200 mm
1.3 Thickness: 100 mm
(as per drawings below)
2. Vibration isolated table support (Active vibration isolated table)
The table support system should have 4 interconnected legs. Each leg can be filled individually with compressed air. A compressor should be supplied with capacity sufficient to give max pressure of 80psi or higher for keeping the table top isolated from surrounding vibrations.

Table supports should be able to isolate the tabletop from vertical and horizontal disturbances. It should effectively isolate the optical table from vertical and horizontal vibrations throughout the critical 3 to 50 Hz frequency range. The table should reduce the vibrations transmitted to an optical table setup in a noisy environment. When the source of compressed air is removed, the Optical Tabletop should lower until safely rests on the table’s supports. Typical parameter to be attained:

<table>
<thead>
<tr>
<th>Sr no</th>
<th>Parameter</th>
<th>values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Support system interconnected (L x W):</td>
<td>820 x 820 mm</td>
</tr>
<tr>
<td>2.2</td>
<td>Support system Height (H) :</td>
<td>800 mm</td>
</tr>
<tr>
<td>2.3</td>
<td>Vertical Resonant Frequency :</td>
<td>1.25 Hz</td>
</tr>
<tr>
<td>2.4</td>
<td>Horizontal Resonant Frequency :</td>
<td>1.0 Hz</td>
</tr>
<tr>
<td>2.5</td>
<td>Vertical Transmissibility at Resonance :</td>
<td>10 dB</td>
</tr>
<tr>
<td>2.6</td>
<td>Horizontal Transmissibility at Resonance:</td>
<td>12 dB</td>
</tr>
<tr>
<td>2.7</td>
<td>Vertical Transmissibility at 5Hz :</td>
<td>-20 dB (90%)</td>
</tr>
<tr>
<td>2.8</td>
<td>Horizontal Transmissibility at 5Hz :</td>
<td>-24 dB (94%)</td>
</tr>
</tbody>
</table>
2.9 Vertical Transmissibility at 10Hz : -32.5 dB (97.5%)  
2.10 Horizontal Transmissibility at 10Hz : -30 dB (97%)  
2.11 Maximum Load Capacity (set of four) : 1000 kg  
2.12 Height Adjustment Range : -10 mm, +5 mm  
2.13 Self-Levelling Repeatability : ± 0.5 mm  
2.14 Height : 700 mm  
2.15 Air Pressure (Maximum) : 80 psi

(Fig-2: Representative photo to support sytem for above vibration isolated table top)

3. Transparent enclosure with hinged front doors (Representative picture only shown below) (To be fixed to above optical table top)
3.1 Length: 1200mm  
3.2 Breadth: 1200mm  
3.3 Height: 300mm - 400mm  
3.4 Wall material: Transparent acrylic sheet (~ 3mm thick)  
3.5 Lockable & Openable doors in all four side of the table.  
3.6 Provide two numbers of through holes at both top and side wall, each of 50mm diameter with covering cap (when not in use) to run cable across it.

(Fig-3: Representational figure showing the transparent box on table top only. Door to be provide although not shown in figure)

4. Rotation stage : 1 nos
4.1 Details: -
4.2 Readout : 0.1°
4.3 Construction : Aluminum Alloy B51S
4.4 Finish : Black anodized (Al)
4.5 Tapped holes on top disc : M6 tapped holes
4.6 Mounting holes on the base : M6 CBR
4.7 Design : Modular
4.8 Coarse travel : 360°
4.9 Fine travel : ± 4°
4.10 Top disc size : Diameter 75 mm
4.11 Load capacity : 45 kg vertical
4.12 Drive : Micrometer

5. **Beam steering mount: 1 nos.**

5.1 Mirror Mounts: Kinematic Mirror without Translation for 1” circular optics
5.2 Angular Movement: +/- 2.5° tilting
5.3 Tilting knob: Lead screw for tilting
5.4 Rotational movement: 360° rotation with lock knob
5.5 Length Flexibility: Up and down orientations: maximum travel length 400mm
5.6 Base: Compatible with heavy duty post with slots for M6 bolting (as per figure below: -)

(Fig-4: Beam steering mount with two 1” kinematic mirror mount)

6. **Mini optical breadboard**

6.1 Thickness: 5 mm thick
6.2 Length: 150 mm
6.3 Breadth: 150 mm
6.4 Tapped holes: M4 Standard Tapped Holes on 12.5mm Grid
6.5 At four corners: M6 counter sunk holes for fixing
6.6 Material of Construction: Aluminum
6.7 Coating: Black Anodized Finish
6.8 Machining Tolerance +/- 0.3 mm over 300 mm length
6.9 Surface flatness +/- 0.15mm over 300 mm square area
7. **General terms and conditions:**

7.1 The items after fabrication will be delivered to BARC, Mumbai only after submission of dimensional and performance report as applicable. The complete order has to be supplied within **60 days** of the issue of the purchase order. The material is to be supplied at **B-204, Basement Mod-Labs, BARC Trombay, Mumbai**. Shorter delivery period will be preferred.

7.2 The suppliers may quote for the work per unit rate basis or as lump sum amount. Taxes and other charges, if any, should be separately quoted.

7.3 If any clarification is required it should be obtained before starting the work.

7.4 If any defect is found in the finished jobs or if they do not meet the specifications, the same will be rejected and to be taken back by the manufacturer at his own cost.

7.5 These items are to be packed for damage free transport.

7.6 The workmanship should be of good quality.

7.7 The vendor will supply all the fabricated items at the site and will provide all the material required for this fabrication job.

7.8 No free issue material will be given to the party.

7.9 The fabricator shall provide the test report of all the materials meeting the required specifications for the quality assurance (QA).