



**NOTICE INVITING QUOTATIONS**

File No.	582/22-23/PROD/MDS/SERV/007	Date:	10.05.2023
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**To**

(Supplier Address)

Sealed quotations are invited from reputed Authorized Dealers / manufacturers for the supply of the Items.

- Name of the Item : Software based system design  
Specification : (As per enclosed Schedule Annexure – I)
1. Quotation Reference No. : 582/22-23/PROD/MDS/SERV/007
  2. Last date and Time for receipt of quotation : 02.06.2023 before 03.00 PM
  3. Date & Time of opening of Quotation : 02.06.2023 at 03.30 PM
  4. EMD Amount : 2%
  5. Validity (Days) : 90 days
  6. Address to which quotations are to be sent

The Director,

National Institute of Technology,

Tiruchirappalli – 620 015, Tamil Nadu, India

**Kind attention to** : Dr. M. Duraiselvam

Phone : 04312503509

E-mail : durai@nitt.edu

7. Quotations should be submitted in the format given in Annexure – I and Annexure-II
8. The envelope should contain the following details:

**“QUOTATION AGAINST ENQUIRY (Software based system design,  
582/22-23/PROD/MDS/SERV/007)**

**Kind attention to: Dr. M. Duraiselvam**

**Last date and Time for receipt of quotation : 02.06.2023 before 3 PM**

## Terms and Condition

1.	The quotation must be in the format furnished by NIT Tiruchirappalli and should be free from corrections/erasures. In case there is any unavoidable correction it should be properly attested. If not the quotation will not be considered. Quotation written in pencil and incomplete will be rejected.
2.	You are invited to submit your most competitive quotation for the supply of goods according to the specifications and delivery terms as given. Bank guarantee submitted for EMD shall be valid for 45 days beyond bid validity period.
3.	Bidders may send the quotations in sealed covers with the quotation reference number and last date for receipt of quotations duly superscribed on the cover. <b>Kind Attention to: Dr. M. Duraiselvam as mentioned in the point No. 6</b> NB: Mention the company Contact Number / E-mail id on the cover.
4.	Quotation will be opened on the due date at <b>3.00 PM at the R &amp; C Section, NIT, Tiruchirappalli</b> in the presence of the tenderers or their representatives who may wish to be present. (Any change in the date, time and venue of the quotation opening will be informed to the bidders through telephone / E-mail)
5.	The National Institute of Technology, Tiruchirappalli reserves the right to accept or reject any quotations, and to cancel the bidding process, and reject all quotations at any time prior to the award of order without assigning any specific reason thereof.
6.	Manufacturer's name and country of origin of materials offered must be clearly specified. Printed brochures, Purchase preference is only for Micro & Small enterprises ( <b>MSE's</b> ) register in <b>UDYAM</b> Portal or <b>NSIC</b> as per Ministries policy for <b>MSE's</b> . Proof to be attached
7.	Samples must be submitted where specified along with the quotations. Samples must be carefully packed, sealed and labelled clearly with enquiry number, subject and sender's name for easy identification. Rejected samples will be returned at your cost if insisted
8.	All supplies are subject to inspection and approval before acceptance. Manufacturer / supplier warranty certificates and manufacturer / Government approved lab test certificate shall be furnished along with the supply, wherever applicable
9.	National Institute of Technology, Tiruchirappalli reserves the right to modify the quantity specified in this enquiry.
10.	Startup company exempted from prior turnover & prior experience (startup certificate registered with DIPP should be enclosed)
11.	The bidder has to submit the bids in sealed envelope, (separate for each tender). Further Bidder should not send clubbing many tenders in one envelope, in such case all the bids will be rejected.

12.	<p><b>Bid Price</b></p> <p>a. The contract shall be for the full quantity Bidders must quote for entire quantity. Each bidder shall submit only one quotation in Indian Rupee only.</p> <p>b. Post work orders &amp; completion certificate should be submitted, wherever applicable.</p> <p>c. The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.</p> <p>d. GST, packing, forwarding and delivering other allied items at the destination shall be included in the price. All such price components may be shown in the quotation. If there is no indication regarding above charges. It will be considered as inclusive of all charges.</p> <p>e. If any arithmetic mistake in total / GST calculation is observed, the same shall be corrected by the purchaser with an intimation to bidder</p> <p>f. In case the items in the enquiry are covered by any rate contract or any other state or central Government, it should be specified in your quotation and accepted contract rates should also be mentioned. It should be confirmed whether you could supply at the RC rates outside rate contract</p> <p>g. Quotations containing conditions like “subject to prior sale” may not be considered.</p> <p>h. Delivery period required for supplying the material should be invariably specified in the quotation</p> <p>i. If there is a discrepancy between unit price and total price, the unit price will be considered. If there is any mismatch between figure and word, the amount in word shall prevail.</p>
13.	<p><b>Evaluation of quotations:</b> Quotations will be evaluated item-wise or lump sum basis. The purchase committee will evaluate and compare the quotations determined to be substantially responsive i.e. (i) are properly signed; (ii) Conform to the terms &amp; conditions and specifications; and (iii) price offered are competitive.</p>
14.	<p><b>Award of contract</b></p> <p>a. The National Institute of Technology, Tiruchirappalli will award the Order for supply of Goods / Services to the bidder whose quotation has been determined to be substantially responsive, and who has offered the lowest evaluated quotation price.</p> <p>b. The Bidder should furnish the contract agreement and performance security within 15 days from the date of receipt of the order for supply of goods / services, failing which the order will be cancelled without further notice and awarded to next eligible bidder.</p> <p>c. Notwithstanding the above, National Institute of Technology, Tiruchirappalli reserves the right to accept or reject any quotations, and to cancel the bidding process, and reject all quotations at any time prior to the award of order without assigning any specific reason thereof.</p> <p>d. National Institute of Technology, Tiruchirappalli, prior to the expiration of the quotation validity period, will notify the bidder whose bid is accepted for the award of contract. The terms of accepted offer shall be incorporated in the purchase order.</p>
15.	<p><b>Warranty:</b> Nil</p>
16.	<p><b>Performance Security:</b> NIL</p>
17.	<p><b>Payment:</b> 100% will be paid after acceptance of work order. The invoice should be raised in favor of “The Director, National Institute of Technology, Tiruchirappalli, Tamil Nadu, India.” with institute GST No. 33AAATN5491Q1ZZ.No advance will be provided to the supplier and installer.</p>
18.	<p><b>Liquidity damages</b> If the bidder / supplier, after accepting the Purchase Order or supply of Goods / Services, fails to deliver any or all of the Goods or to perform Services within</p>

	the period(s) specified in the Order, The National Institute of Technology, Tiruchirappalli shall impose penalty without assigning any reasons to the bidder / supplier a sum equivalent to 0.50 % of the total cost as indicated in the Purchase Order (which will be deemed as agreed price) for each week or part thereof of delay until actual delivery or performance is completed and such penal charges shall be limited to a maximum of 5% of the agreed price. Once the maximum is reached The National Institute of Technology, Tiruchirappalli, may proceed on its own to consider the termination / cancellation of the Order and may inform the bidder about the cancellation of the said purchase order. unless extension is obtained in writing from the office / Department on valid ground before expiry of delivery period
19.	If the deliveries are not maintained and due to that account Procuring Entity is forced to buy the material at your risk and cost from elsewhere, the loss or damage that may be sustained there by will be recovered from the defaulting supplier
20.	Dispute clause: Any dispute relating to the Enquiring /Tender of the indented item shall be under the Hon'ble Court having its jurisdiction over Tiruchirappalli only
21.	Startup company exempted from Prior Turnover & Prior Experience (Startup certificate registered with DIPP should be enclosed)
22.	Bids submitted without EMD ( <b>unless exempted</b> ) will be treated as disqualified.
23.	The successful bidder should submit <b>Security Deposit/PBG</b> within 15 days from the date of placement of order. The <b>EMD</b> shall be returned only after receipt of SD. If the bidder fails to deliver the material, then the <b>EMD/SD</b> shall be forfeited.
24.	In LTE, bidder has to submit in sealed envelope (separate for each tender). <b>Further Bidder should not send clubbing many tenders in one envelope, in such case all the bids will be rejected.</b>

For any details / clarifications regarding could be obtained, contact Research & Consultancy section from the National Institute of Technology, Tiruchirappalli on all working days during 10 AM to 5 PM.

For further detail kindly contact Dr. M. Duraiselvam (Purchase initiator)

(NB: Mention the Contact Number / E-mail on the cover. Any change in the date, time and venue of the tender opening will be informed to the bidders through telephone / E-mail)

**Enclosures:**

- |                                  |                |
|----------------------------------|----------------|
| Specifications of the work order | Annexure - I   |
| Price Format                     | Annexure - II  |
| Bid Security Declaration form    | Annexure – III |
| Bank Mandate Form                | Annexure – IV  |



**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI - 620 015**  
**DEPARTMENT OF PRODUCTION ENGINEERING**

**Annexure- I**

**Specifications of the item**

**Ref:** 582/22-23/PROD/MDS/SERV/007

**Date:** 10.05.2023

<b>Sl. No.</b>	<b>Specification of NIT-T</b>	<b>Specification of the Supplier</b>	<b>Reasons (if there is difference in specification)</b>
1.	<p>Software based system design</p> <ol style="list-style-type: none"><li>1. The system design defines the design and creation of complete Digital Twin (DT) for the physical robotic Additive manufacturing process.</li><li>2. Defining the hardware specification for the system design. Creating detailed system design modules (User Scenarios and workflows, User Requirements Specification, Detail Design, Test Cases etc.).</li><li>3. The vendor should develop a virtual model of the FANUC R-2000iC/210L robot setup and define the specified kinematics motion range for the robot mentioned below.</li><li>4. To define the workflow of complete extruder setup for the additive manufacturing process and that will be fixed on the robot arm.</li><li>5. Validate the reachability of robot axes motion range with some test cases to reach the total volume of 8m<sup>3</sup> (2m x 2m x 2m) from the build plate.</li><li>6. Collecting the data from the physical model through the robot controller setup and extruder controller like position of robot axes from one stage to another stage, define robot path planning as per the slicing data, print speed and thereafter calculate the parameters like total time taken for the overall print, support structure generation, volume of materials to be used etc.</li><li>7. Analysis of Existing vs. Proposed system in respect of value addition / advantage. Design should be structured such that most of changes like enabling / disabling of any service should be through system design.</li><li>8. Modules like position data, temperature data etc. collected from the physical model through the controllers and sensors should be integrated in the Digital Twin (DT).</li><li>9. All the history / existing data of the physical model should migrate to the system. There should not be any history / existing data loss.</li><li>10. Support &amp; Migration of data during a parallel run: At the time of 3D Printing deployment, both (Physical and Virtual) will run parallel for a certain time period for smooth Functionality Testing.</li><li>11. System Design Requirement<ol style="list-style-type: none"><li>a. The vendor has to design and develop the Digital Twin</li></ol></li></ol>		

- (DT) system such that it may cater to the change of the system of new form with configurations which may be analysed and provided to the system.
- b. Design a complete workspace of the system design.
  - c. Develop the optimised sequence for the robot as per the slicing data of the printing process.
  - d. There should be dynamic report generation / analysis feature within the system design. User should be able to select required data, filtration, sorting at runtime for any module according to their access.
12. The vendor is responsible for maintaining and managing the performance and real time display of the system design developed and implemented by them by configuring and optimizing Print parameters, path planning and layer slicing of the Production Environment during the period.
  13. The system design should be tested against a peak volume of around 8m<sup>3</sup> 3D models like missiles, drones etc. and certified documentation of such test to be provided during the development phase.
  14. The system design should be configurable enough to visible / enable certain features / functionalities such as Print speed, Layer thickness and types of infill, infill density etc. for Development & Implementation of Digital Twin through controller with start and end process with proper authorization.
  15. The vendor has to provide the list of hardware such as required sensor for collecting data etc. that will be required to create the Development, Staging and Production Environment as part of the solution along with the required configuration details. The details must be submitted by the Vendor as a part of the Technical Bid.
  16. The system design should perform consistently during the printing peak volume of 8m<sup>3</sup>.
  17. The System design should maintain the data and keep a record of that for later verification with search features for analysing.
  18. The system design is expected to allow users to design and generate the slicing data and support structure generation. Vendor to propose a mechanism and detail how the proposed system design will address the needs of various complex structures.
  19. The system should be able to link with existing data for the optimisation purpose.
  20. The solution should be up and running within the time period specified by the vendor in the Technical Bid.

**Specifications of the FANUC R-2000iC/210L**

S.NO	Description	Details
1.	Max. Load capacity at Wrist (Kg)	210
2.	Reach (mm)	3100
3.	Controlled axes	6

	4.	Repeatability (mm)	±0.05			
	5.	Mechanical Weight (Kg)	1350			
	6.	Motion Range (°)	Axis 1 – 370 Axis 2 – 136 Axis 3 – 301 Axis 4 – 720 Axis 5 – 250 Axis 6 – 720			
	7.	Max. Speed (°/s)	Axis 1 – 105 Axis 2 – 90 Axis 3 – 85 Axis 4 – 120 Axis 5 – 120 Axis 6 – 200			
	8.	Moment/Inertia	Axis 4 – 1700/320 Axis 5 – 1700/320 Axis 6 – 900/230			
	9.	Average Power consumption (kW)	2.5			

**Signature & Seal of Vendor with Date**



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI - 620 015  
DEPARTMENT OF PRODUCTION ENGINEERING

Annexure- II

**PRICE BID FORMAT FOR BIDDERS**

Tender No. & Date : 582/22-23/PROD/MDS/SERV/007 Dt. 10.05.2023

Bidder's Offer No. & Date :

S. No.	Description of item	Unit (Set / No)	QTY	Rate / Qty in Rs. (excluding GST)	GST in Rs.			Total Value + GST in Rs.
					SGST	CGST	IGST	
1.	<b>Supply portion</b> (The price indicated shall be exclusive of all accessories, spares etc. as given in the scope of supply)							
2.	Other accessories / spares etc. as given in scope of supply (Individual item-wise break-up price shall be attached as an annexure to this price bid format.)							
3.	Installation and Commissioning (extra, if any)							
4.	Packing & Forwarding charges (extra, if any)							
5.	Freight & Transit insurance charges, extra, if any							
6.	Total price (delivery, installation and commissioning at NIT-T)							
7.	Value of Annual Maintenance Contract							
8.	<b>Net cost to be paid by NIT-T</b>							

**Signature & Seal of Vendor**

**Note: The price bid should be submitted only as per the above format. No row shall be left blank. Please indicate NA, in case the item is "Not Applicable". If this format is not used or any column is left blank, then the bid will be rejected.**



**(TO BE PRINTED IN LETTER PAD OF THE FIRM)**

**EMD Returning Form**

To  
The Director  
National Institute of Technology,  
Tiruchirappalli – 620 015

Sub: Returning EMD amount

Sir / Madam,

Our firm has participated in the tender / quotation enquiry No mentioned below and produced the EMD amount through DD, details of the DD are given below.

Tender / Quotation Reference No	
EMD amount	
DD Number	
DD issued Bank	
Date of DD	

It is requested to return the EMD amount to our firm after completion of the purchase to the below mentioned Bank account.

Account Name	
Bank Account Number	
IFSC code	
Bank	

**Signature with Seal and Date**

**MANDATE FORM FOR ELECTRONIC FUND TRANSFER/RTGS TRANSFER**

Date: / /

To

The Director,  
National Institute of Technology,  
Tiruchirappalli – 620 015, Tamil Nadu

Sub	:	Authorization for release of payment / dues from National Institute of Technology, Tiruchirappalli through Electronic Fund Transfer/RTGS Transfer.
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1. Name of the Party / Firm / Company / Institute :
2. Address of the Party :
3. City \_\_\_\_\_ Pin Code \_\_\_\_\_
4. E-Mail \_\_\_\_\_ Mobile No: \_\_\_\_\_
5. Permanent Account Number \_\_\_\_\_
6. Particulars of Bank:

Bank Name:		Branch Name:	
PIN Code:		Branch Code:	
IFS Code:(11 digit alpha numeric code)			
Account Type	Savings	Current	Cash Credit
Account Number:			

**DECLARATION**

I hereby declare that the particulars given above are correct and complete. If any transaction delayed and not effected for reasons of incomplete or incorrect information I shall not hold Director, National Institute of Technology Tiruchirappalli responsible. I also undertake to advise any change in the particulars of my account to facilitate updating of records for purpose of credit of amount through NEFT/RTGS Transfer.

Place: \_\_\_\_\_ Date: \_\_\_\_\_

**Signature & Seal of the Authorized Signatory of the Party**

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