



TMT INTERNATIONAL OBSERVATORY LLC
REQUEST FOR PROPOSAL (“RFP”)
FOR
SEGMENT MACHINING AND INTEGRATION

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1. DESCRIPTION OF REQUEST FOR PROPOSAL

1.1 INTRODUCTION

For the purposes of this RFP, Respondent's shall use the following applicable documents ("AD") to develop their proposals:

1. AD1 - TMT M1 Polished Roundel: M1S-001-01001 Rev F
2. AD2 – Roundel Polishing Specification: TMT.OPT.SPE.15.002
3. AD3 - TMT M1 Polished Segment: M1S-001-01000 Rev J ("Hexing Drawing")
4. AD4 - TMT Segmentation Database: TMT.OPT.TEC.07.044
5. AD5 - Specification for Finished Primary Mirror Segments: TMT.OPT.SPE.07.002
6. AD6 - M1 Segment Finished Segment Specification - Vendor Table (TMT.SEN.TEC.12.002.)
7. AD7 - TMT M1 Intermediate PMA Assembly Drawing: M1S-01-05000 Rev C ("Integration Drawing")
8. AD8 - Bond Procedure: TMT.OPT.TEC.16.001
9. AD9 - Integration Procedure: TMT.OPT.TEC.19.013
10. AD10 - TMT M1 Overview Document: TMT.OPT.TEC.09.003
11. AD11 - Quality Assurance Plan: TMT.PMO.MGT.10.008
12. AD12 - TMT M1 Bonded Mirror Assembly: M1S-001-04000 Rev A
13. AD13 – Model Contract

The "TMT Project" is a collaboration of the California Institute of Technology, the University of California, the Association of Canadian Universities for Research in Astronomy, the National Astronomical Observatory of Japan, the Department of Science and Technology of India, and the National Astronomical Observatories of China with a mission to design, construct, and operate a thirty meter optical/infrared telescope. The TMT Project is managed by the TMT International Observatory LLC ("TMT" or "TIO") which is the legal entity issuing this RFP and any resultant contracts.

The TMT observatory shall have a 30m diameter primary mirror ("M1") composed of 492 hexagonal shaped segments made of low expansion glass material. Each hexagonal segment has an approximate size of 1.44m across the corners and an approximate thickness of 45mm. The optical surface of these segments are non-axially asymmetric hyperbolic in shape with asphericity ranging from 6um to 230um. The 492 segments are composed of 82 unique segment types which populate the array in six repeating sectors. In addition, 82 spares (one of each segment type) will be produced. The segments are fabricated from CLEARCERAM-Z-HS as described by AD1, *TMT M1 Polished Roundel: M1S-001-01001 Rev F* and AD2, *Roundel Polishing Specification: TMT.OPT.SPE.15.002*. Additional information is contained in AD 5-8.

After the completion of the polished roundel (the "Roundel"), the Roundel goes through a machining step. During this machining step, the hexagonal shape, the central pocket, edge pockets, datum features, and labels are created at this stage (the "Machining") as described by AD3, *TMT M1 Polished Segment: M1S-001-01000 Rev J*. The bonded mirror assembly described by AD12, *TMT Bonded Mirror Assembly: M1S-001-04000 Rev A* is then created by bonding interface features to the machined segment. The intermediate PMA assembly is created by assembling the Segment Support Assembly ("SSA") to the bonded mirror assembly (the "Integration"). The PMA assembly is described in AD7, *TMT M1 Intermediate PMA Assembly Drawing: M1S-01-05000*

1.2 BACKGROUND INFORMATION

Respondents shall propose how they would develop all glass-ceramic machining processes and the tooling plan ("MPT Plan") needed to transform 231 polished glass roundels into machined segments of 33 types designated by TMT ("Machined Segments"). Respondents' proposals shall include a presentation of their MPT Plan to TMT (MPT

Plan Demonstration”), demonstrating that the tooling and processes proposed will produce Machined Segments that meet all necessary requirements defined in AD3, *TMT M1 Polished Segment: MIS-001-01000 Rev J* and AD4, *TMT Segmentation Database: TMT.OPT.TEC.07.044*.

In addition to the Machining, Respondents may propose how they would perform the Integration. Integration includes the development of a bonding and integration procedure along with the necessary tooling to transform 231 Machined Segments into polished mirror assemblies (“PMA”). Respondents’ proposals shall demonstrate that the Integration tooling and processes will produce final PMAs that meet all necessary requirements defined in AD7, *TMT M1 Intermediate PMA Assembly: MIS-001-05000 Rev V*; AD8, *TMT Bond Procedure TMT.OPT.TEC.16.001*; and *TMT Integration Procedure TMT.OPT.TEC.19.013*.

For the purposes of this RFP, TMT is considering the following Machining and Integration Schedule:

	Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	TOTAL												
Machining Rate	231				24	24	24	24	36	36	36	27	
Integration Rate	231					24	24	36	36	36	36	39	

Proposals shall incorporate a limited development period from the Effective Date of the Contract until the commencement of fabrication in 2022. Respondents may deviate from the foregoing Machining and Integration Schedule if they can demonstrate technical or price benefits due to the modification. As indicated by the evaluation guidelines for Proposals, Work schedules that maximize value and minimize price are key criteria for selecting an Awardee.

Respondents may propose only for (1) the Machining or both (2) the Machining AND Integration work (the, “Proposal Options”). Respondents may NOT submit a proposal only for the Integration work. In all cases, Respondents must submit a proposal for the Machining alone. If Respondents propose only for the Machining, Exhibit A of the Model Contract shall be comprised of Sections 1-5 and 10. If Respondents are proposing for both the Machining and Integration, Exhibit A of the Model Contract shall be comprised of Sections 1-4 and 6-10. TMT is noting that once a Contractor is selected, Exhibit A will be modified accordingly with appropriate Sections comprising the SOW. The comprehensive number of Sections under the Model Contract is solely due to the need of addressing both Proposal Options in furtherance of the RFP.

1.3 DEFINITION OF RFP TERMS

- 1.3.1 Work – The collective term for all the services, materials, and deliverables associated with the Machining and, if the Integration option is exercised by TMT, the Integration.
- 1.3.2 Respondent – A person, group, or organization that is submitting a Proposal in accordance with this RFP.
- 1.3.3 Awardee – The Respondent who is selected for negotiation of a contract with TMT for the Work.
- 1.3.4 Contractor – The Awardee who will enter a mutually agreed upon contract with TMT for the Work.

1.4 PROPOSAL TERMS

1.4.1 Shipment and Delivery

Unless specified otherwise in writing, all deliverables shall be submitted electronically to TMT International Observatory LLC via electronic mail. All deliverables shall be submitted to Ben Gallagher (bbgallagher@tmt.org) and Pratheep Eamranond (pratheep@tmt.org).

For the purposes of this RFP, Respondents shall assume that all Roundels and SSAs (if applicable) shall be accepted and picked up by the Contractor in Fremont, CA. For the purposes of this RFP, Respondents shall assume that all Completed Segments shall be shipped from their facilities to Fremont, CA.

1.4.2 Contract Type

This will be a Firm Fixed Price contract.

1.4.3 Taxes, Duties and Currency

Respondents' proposed costs must be in U.S. Dollars and include all required taxes and duties.

1.4.4 Data Rights

TMT will own the rights to all proposals and the Contract deliverables.

1.4.5 Treaty Rights

Respondents must detail any anticipated exercise of treaty rights that requires support from TMT in their proposal. Respondents understand and agree that TMT is not obligated to support the Contractor's rights or obligations under any treaty unless such support is agreed upon in the awarded Contract.

1.4.6 Validity Period

Proposals must be valid for sixty (60) days from the date of submission.

2. INSTRUCTIONS TO THE RESPONDENT

2.1 GENERAL INSTRUCTIONS

Please carefully read the information contained in this RFP, the model contract (the “Model Contract”) and all exhibits to provide a complete response in your proposal to all requirements, guidelines, specifications, and questions contained herein. For the purposes of this RFP, the designated letters for the Exhibits in the Model Contract shall be the same as those used in this RFP.

2.1.1 Respondent Confirmation of Interest

Respondents that are interested in submitting a proposal are responsible for notifying TMT regarding their desire to receive all RFP documentation and communications related to this RFP. Notifications should be submitted in writing to pratheep@tmt.org.

2.1.2 Exhibits and Communications

All information and updates pertaining to this procurement will be posted on our website at: www.TMT.org/doing-business-with-TMT.

2.1.3 Schedule of Events

RFP Issued	May 17, 2019
Request for Clarification	June 7, 2019
Proposal Submittal Date and Time	July 31, 2019
Date of Selection for Negotiation	September 30, 2019

2.1.4 Offer Form

The proposal shall follow the requirements described in Section 5. The proposal shall be submitted with the completed and signed Offer Submittal Form (Exhibit H) as the cover page.

2.1.5 RFP Contacts

The technical contact for this RFP is: Ben Gallagher

The business contact for this RFP is: Pratheep Eamranond

2.1.6 Proposal Submission Protocol

The required method of submission is in an electronic form. TMT will evaluate the proposal in its electronic form. Respondents must submit their proposals to Ben Gallagher and Pratheep Eamranond no later than the proposal submission date and time of July 31, 2019, 5:00PM Pacific Time (“Proposal Submittal Date and Time”).

All questions, requests and correspondence regarding the business and contract aspects of this RFP must be submitted by June 7, 2019 to ensure a response. Business and contract questions submitted after June 7, 2019 may not receive a response. All questions must be submitted in writing to TMT. Please note that TMT reserves the right to post all RFP questions and answers on its website. Questions shall be directed (only) to: Pratheep Eamranond (pratheep@tmt.org).

3. PROPOSAL EVALUATION PROCESS

3.1 PROPOSAL EVALUATION GUIDELINES

Proposals will be reviewed by a TMT Source Selection Board ("SSB") which will submit the results of the review to the TMT Source Selection Authority. The Source Selection Authority will make the final selection of an awardee, if any.

Each proposal will stand alone and be evaluated on its merits. In order to prepare its recommendation to the Source Selection Authority, the SSB will evaluate the best value to TMT based on the following criteria.

- Effectiveness of Project Plan
- Relevant Experience
- Respondent's Commitments for Facilitization or Capital Equipment
- Price
- Flexibility of Fee Schedule
- Proposed Activities and Deliverables
- Qualifications of Personnel Who Will Perform the Work
- Availability of Resources/Throughput
- RFP or Contract Deviations

4. CONTRACT AWARD PROCESS

4.1 QUALIFIED RESPONDENT

TMT will only award a contract to a qualified respondent. The determination of whether a respondent is qualified will be made at TMT's sole discretion

4.2 CONTRACT AWARD CONDITIONS

Issuance of this RFP does not require TMT to award a contract. TMT reserves the right to reject any or all proposals and waive any technicalities, informalities, or irregularities in any proposal at its sole discretion. TMT reserves the right to request clarification or additional information at any time. TMT reserves the right to award multiple contracts, a single contract, or no contracts. In addition, TMT reserves the right to re-solicit proposals or to temporarily or permanently abandon the procurement. If TMT awards a contract, it will award the contract to the respondent or respondents whose proposal(s) is (are) the most advantageous to TMT as determined by TMT at its sole discretion.

TMT also reserves the right to award a contract based on (1) proposals initially submitted, without discussion, clarification, or modification, or (2) the basis of negotiation with none, any, or all of the respondents.

5. PROPOSAL FORM

Respondents are responsible for making sure that their proposal is compliant with the guidelines and terms and conditions of the RFP.

5.1 PROPOSAL FORM GUIDELINES

The organization of the proposal shall be as follows:

5.1.1 Offer Submittal Form

The Offer Submittal Form, attached as Exhibit H to this RFP, shall be used as a cover letter for the proposal.

5.1.2 Table of Contents

Respondents must provide a table of contents with page number references in their proposal. The table of contents should be in sufficient detail to facilitate easy reference to the sections of the proposal and all separate supplemental information.

5.1.3 Introduction/Description of Respondent's Organization

Proposals should begin with an introduction that describes the Respondent's organization. The description should include, but is not limited to, stating how long it has been in business, the principal areas of business activity, and the number of employees. The description should demonstrate that the Respondent has the financial ability, resources, experience, reliability, and environmental and cultural sensitivity and integrity necessary to perform on the potential contract resulting from this RFP.

While it is not a requirement, Respondents are encouraged to submit supplemental documentation in a separate appendix attachment to their proposal (i.e. Form 10-K, financial statements, etc.).

5.1.4 Effectiveness of Project Plan

The proposed Project Plan should demonstrate the Respondent's ability to effectively complete the Machining and Integration within the proposed schedule and budget for the Work. Respondents should describe the methods used for Production of the Completed Segments. In addition to the Work, Respondents should explain how their Project Plan mitigates risk, leverages advantages, and maximizes value for TMT. Respondents should indicate how many Machining Centers and Assembly Stations will be used to execute their Project Plan (including throughput analysis for Completed Segments).

5.1.5 Relevant Experience

Describe the relevant experience, past performance, and expertise that qualifies the Respondent to understand the tasks and costs required to perform the Work.

Respondents are allowed to include supplemental information such as brochures, articles, and one-sheets in a separate appendix.

5.1.6 Respondent's Commitments for Facilitization or Capital Equipment

Respondents should describe what contributions (if any) they shall provide if they are selected as the Contractor for the Work. Contributions include, but are not limited to, leveraging existing facilities or equipment that would generate cost savings for TMT. Contributions are not limited to facilities or capital equipment. Respondents may propose joint research or scientific efforts that would benefit all stakeholders while enabling cost sharing.

5.1.7 Price and Payment Schedule

TMT requests that the proposed payment schedule minimizes the price of payment milestones through 4Q2021 and reserves production milestone payments until afterwards.

The proposed price shall be in U.S. Dollars and shall include all costs, duties, and taxes for the performance of the Work. Respondents shall also provide a fee schedule for each labor category proposed for the performance of the Work. Travel, if required, must be itemized and justified by trip in the proposal. All travel costs must be within the limits of the GSA guidelines. All costs must be reasonable and allowable as set forth in Federal Acquisition Regulations (FAR) part 31.

Respondents must provide a cost breakdown of all the Phases in the SOW. This is **not** a payment milestone schedule; TMT is requesting a breakdown of the estimated price for each Phase of the SOW.

5.1.8 Proposed Activities and Deliverables

Describe how the Work described in the Model Contract will be performed. The statement of work in Exhibit A of the Model Contract describes the tasks and requirements TMT is seeking. Respondents should submit a proposal that meets all the terms and conditions in the Model Contract. Respondents must address all the requirements of this RFP and the Model Contract before offering alternate approaches.

Respondents should consider the following factors and clarifying points when drafting their proposed activities and deliverables:

- 5.1.8.1 Respondents are requested to propose a Work and Fee schedule that best balances (1) the mitigation of funding outlays by TMT through 4Q2021, (2) minimizes the overall production costs, and (3) meets TMT's minimum production rate.

5.1.9 Qualifications of Personnel

List the specific Contractor personnel (including subcontractors) who will be performing the Work. Key personnel who are actually performing the work shall be identified and a curriculum vita ("CV") shall be provided.

5.1.10 Availability of Resources/Throughput

Respondents should demonstrate that they have the resources and personnel to commence and complete Production in accordance with the Project Plan. For example, Respondents should show that they can have timely access to the required materials and are not overleveraged by other projects during the proposed Work schedule.

5.1.11 RFP or Contract Deviations

Respondents must list and justify all requested deviations from the requirements and terms and conditions for the RFP and Model Contract. TMT will, at its sole discretion, determine whether deviations are acceptable. When possible, TMT requests that an option for a compliant approach be proposed in each instance where the Respondent is proposing a deviation.

6. MODEL CONTRACT (AD13, MODEL CONTRACT)

7. EXHIBITS

All RFP Exhibits are provided on an "as is" basis. All of the Exhibits are subject to change without notice. TMT is not responsible for the content of these Exhibits or the results of using these Exhibits for any use other purpose than the preparation of costs and schedules for this RFP.

List of Exhibits:

Exhibit A – Statement of Work

Exhibit H – Offer Submittal Form

7.1 EXHIBIT H - OFFER SUBMITTAL FORM

All proposals must be accompanied by the Offer Submittal Form attached.

TMT International Observatory LLC

Offer Submittal Form

Organization Information

Offeror Name:
U.S. EIN (If Applicable):

Address:
Street Address

City

State

ZIP Code

Respondent Information

Full Name:
Last *First* *M.I.*

Title:

Address:
Street Address

City

State

ZIP Code

Tel: ()

Fax: ()

TOTAL ESTIMATED COST
OF PROPOSAL

E-mail Address:

Electronic Mailing Instructions

Please send to:
bbgallager@tmt.org
pratheep@tmt.org

TMT RFP No.: TMT.BUS.MGT.19.127.REL01

Terms and Conditions

Acceptance. The Respondent hereby accepts all the terms and conditions set forth in the referenced RFP.
The signature affixed below is made by an individual authorized to bind the Respondent.

Authorized Signature

Date Signed

Print Name

Title