Attachment A

Statement of Work (SOW) for Mayall Exterior: Repainting and Resealing Telescope Building Structure

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Change Record, Access, and Distribution

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Content Change Table

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1.2	2026-04-22	Appendix A and Distribution Type updates.	Mei Starns, Angelica Junco

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1. Overview

NOIRLab is initiating a planned facilities maintenance and upkeep project at the Mayall 4-meter Telescope facility at Kitt Peak National Observatory. The purpose of this project is to address aging building envelope systems and deteriorated coatings in accordance with established maintenance standards and environmental compliance requirements. As part of this maintenance effort, NOIRLab will engage a qualified general contractor to perform surface preparation, hazardous materials mitigation, repainting, and resealing of the building structure. The work will be executed in two phases:

Phase 1 – Pilot Application and Validation:
Application and performance testing of the specified treatment system on a limited section of the structure to verify compatibility, adhesion, durability, and compliance with environmental and safety standards.

Phase 2 – Full Implementation:
Upon successful validation of Phase 1, the approved treatment system will be implemented across the remaining structure. This phase may also include localized metal repairs and surface remediation necessary to restore the building envelope to acceptable operational and protective standards.

This maintenance project supports NOIRLab's long-term facilities stewardship strategy by reducing deferred maintenance, mitigating environmental risk, and sustaining a safe operating environment for the ongoing DESI Survey.

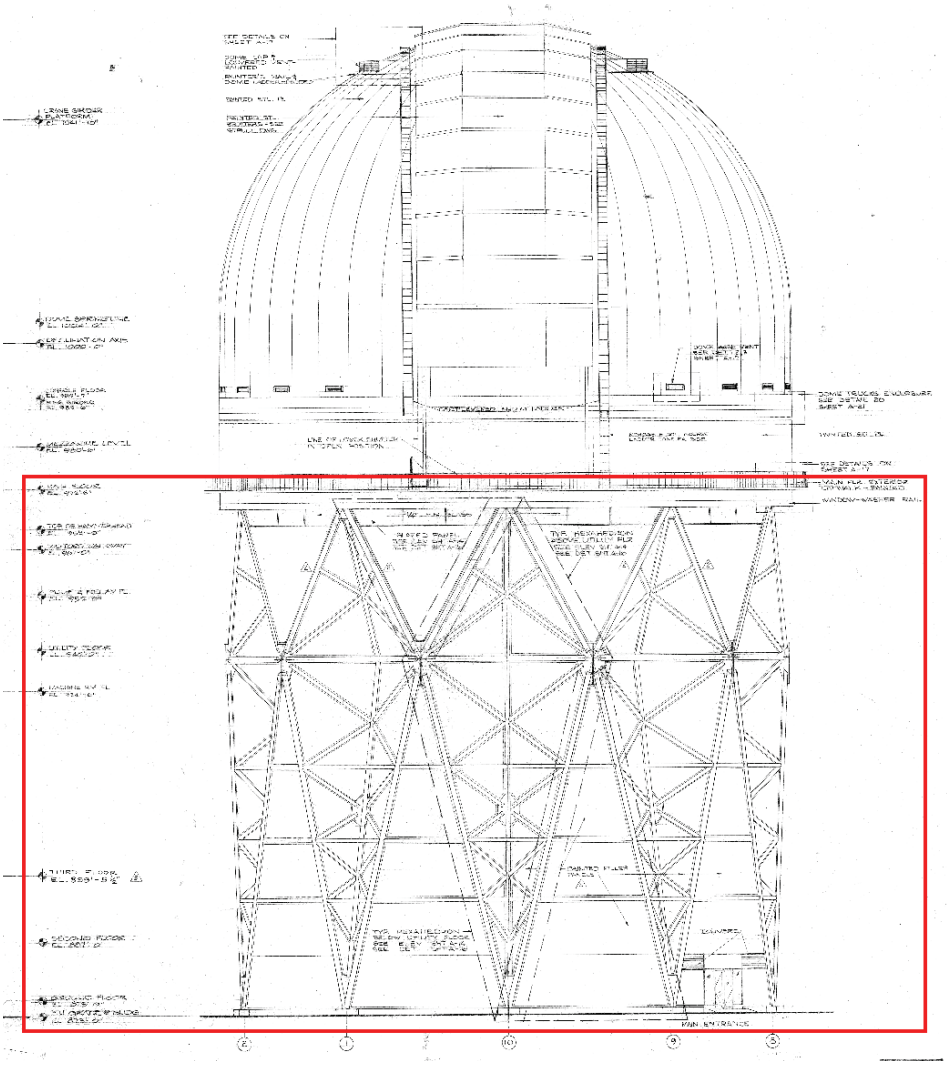
An aerial view of the Mayall at KPNO. Credit: Kitt Peak National Observatory/NOIRLab/NSF/AURA/P. Marenfeld.

Background Information

The Nicholas U. Mayall 4-meter Telescope was the second-largest telescope by aperture at the time of its first light in 1973. The 18-story telescope, located just below the summit of Kitt Peak, can be seen from over 50 miles away. Today, it is the largest at Kitt Peak National Observatory.

The Mayall telescope currently hosts the Dark Energy Spectroscopic Instrument (DESI), the most powerful multi-object survey spectrograph in the world. DESI is supported by the Department of Energy (DOE) Office of Science. The DESI project and the operations of the survey are led by the Lawrence Berkeley National Laboratory.

Area of Work



Elevation drawing of the Mayall at KPNO. Area of Work is shown within the red boundary. Details can be found in the Elevation and Section Drawing file in Appendix A. Credit: Kitt Peak National Observatory/NOIRLab/NSF/AURA/SOM.

Area of work is shown in the above figure within the red boundary. This includes the entire exterior structure from Finished Grade Level at EL 873'-0" to the Main Floor Level at EL 972'-6", as noted in the reference document *Elevation and Section Drawing* file found in Appendix A. This Area of Work shall henceforth be referred to as the "building structure". This project scope does not include anything above the Main Floor Level (henceforth referred to as the "dome").

General Site Conditions

1. The facility is owned by the National Science Foundation (NSF) and is located about 56 miles west of Tucson, AZ, within the boundaries of the Tohono O'odham Nation (TON) at the terminus of Arizona State Route 386. KPNO is an internationally-renowned observatory operated by NOIRLab and the Association of Universities for Research in Astronomy, Inc. (AURA) through a cooperative agreement with the NSF. The facility is situated at about 6800+ feet above sea level.
2. The internal roads are the Observatory's responsibility and are utilized by both vehicles and general public pedestrians visiting the site. Safety on the roadways is a primary concern and a maximum speed limit of 10 mph is required on the summit.
3. Regular working hours on Kitt Peak are from 8:00 AM to 4:00 PM. Other arrangements for work in daylight hours may be mutually established in advance with the Owner's Technical Representative (TR). Under no circumstances shall any exterior work take place during non-daylight hours.
4. Many of the occupants located on KPNO are day sleepers. In order to reduce disruption to these occupants, noisy activities and/or vehicular traffic in the dorm areas must be controlled as much as possible and generally limited to the hours of noon to 4:00 PM, depending on the season.
5. The scientific use of the Mayall facility shall remain in operation. Telescope operations must continue undisturbed throughout the project. These operations include, but are not limited to: dome movement/opening, staff and visitor access to building, garage access, etc.
6. The site has limited access to water, as it collects and treats its own supply. Contractor(s) shall provide their own water supply. Further details may be found in the construction documents.

Codes and Standards – Safety

1. Contractor(s) shall comply with the requirements of all applicable provisions of the latest edition of the International Code Council publications (IBC, ADA, NEC, UMC, UPC, etc.), as well as all other applicable State and National Codes, Kitt Peak guidelines, and Tohono O'odham regulations.
2. Contractor(s) shall be aware of and comply with all OSHA requirements and regulations. Contractor(s) shall take all measures necessary to protect their employees, KPNO personnel, and visitors in adjacent areas from injury related to the work. Appropriate barricades and signage shall be utilized. The facilities will be in use during the performance of this contract.
3. Contractor(s) and personnel shall be licensed/certified in the State of Arizona in the relevant disciplines of work they are to perform (i.e. hazardous materials abatement, etc.).
4. Contractor(s) shall comply with applicable TO Tribal Employment Rights Office (TERO) and

TON Environmental Protection Office (EPO) regulations and provide evidence of compliance to AURA contracts office prior to starting work, as necessary.

5. As a federally-owned facility located on tribal lands, Kitt Peak National Observatory is the Authority Having Jurisdiction (AHJ).
6. Contractor(s) shall be responsible for the proper protection of their materials and equipment until the completion of the project, including protection from inclement weather.

2. Scope of Work

In addition to the work outlined in the construction documents, the scope of work shall include the following tasks:

2.1. Mobilization & Site Setup

- Coordinate site access, staging areas, and laydown locations with NOIRLab
- Install temporary protections, containment systems, and access scaffolding or lifts as required.
- Conduct pre-implementation meetings and site-specific safety orientations.

2.2. Verification & Documentation

- Prior to the start of work, conduct a joint site verification walkthrough with the Facilities Manager to confirm the limits of removal and identify protection needs.
- The Contractor shall maintain updated redline drawings throughout the project showing all removed elements, utilities capped or rerouted, and discoveries in field conditions.

2.3. Surface Preparation & Protection of Existing Facilities

- Perform selective removal of existing deteriorated coatings, sealants, and corroded materials as indicated in the Contract Documents.
- Protect adjacent structures, finishes, sensitive equipment, and operational areas during demolition and preparation activities.
- Prepare substrates through cleaning, abrasion, grinding, or other approved methods to achieve required surface profiles while preventing further environmental contamination.
- Coordinate with the Owner's IT, fire alarm, and building controls systems before disturbing any existing infrastructure.
- Coordinate all utility disconnections (mechanical, electrical, controls, fire protection) with the Owner's Representative and Facilities Manager.
- Maintain exits during demolition at all times.

2.4. Waste Management & Recycling

- The Contractor must properly handle, transport, and dispose of hazardous materials in compliance with applicable regulations and specifications.
- Document waste diversion, recycling, and disposal activities as required.

2.5. Delivery, Storage, & Handling

The Contractor shall deliver materials to the site in the manufacturer's original, unopened containers and packaging, with labels identifying the product name and manufacturer. Materials shall be stored in a clean, dry area indoors per the manufacturer's instructions and protected from damage during handling and installation.

2.6. Submittal Review

The Contractor, in consultation with NOIRLab, shall establish and implement procedures for processing and approving shop drawings, product data, samples, and other submittals from the contractors (e.g., contracts, specifications, schedules, correspondence, meeting minutes, catalog data, directives, change orders, maintenance plans, etc.). The Engineering Firm shall coordinate the processing and approval of all submittals. The Contractor, in consultation with NOIRLab, will establish and maintain a submittal log to ensure compliance with the contract documents.

2.7. Product Testing & Application

- Phase 1: Apply the solution specified on a small section of the structure per the construction documents. No additional coating work shall proceed (Phase 2) until this test section has been accepted and approved by the engineering firm and NOIRLab.
- Phase 2: Implement the specified solution throughout the structure once acceptance and approval has been granted. Additional work may include necessary building modifications to implement the plan, such as small metal repairwork.
- Achieve required film thicknesses, adhesion, and finish quality.
- Perform touch-up and corrective work as necessary to meet quality standards.

2.8. Ongoing Operations

The Contractor shall provide administration, management, and related services necessary to coordinate all activities of the subcontractors with each other and with the occupants to allow ongoing operations to proceed with minimum disruption and risk. The Contractor shall submit to NOIRLab a detailed project schedule and strategic plans to limit downtime to existing operations. The Contractor shall notify NOIRLab a minimum of five (5) business days before any service shutdowns, including deenergizing the main service.

2.9. Quality Control

The Contractor shall observe all work in progress to ensure quality of work and compliance with the contract, construction documents, and manufacturer requirements. Contractor shall keep NOIRLab informed about the progress and quality of the portion of work completed and report to NOIRLab in a timely fashion any defects, deficiencies, or known deviations from the contract and/or construction documents that may negatively impact the most recent project schedule submitted by the Contractor.

2.10. Change Orders

All change orders shall be reviewed by NOIRLab for approval. NOIRLab Contracts Officer (CO), TR, and the Contractor shall develop and implement a system for the review and processing of change orders. All change orders require written approval from the CO and TR.

2.11. Inspections, Testing, & Commissioning

The Contractor, in coordination with the TR, shall coordinate the review of inspection and testing reports, and make recommendations regarding the results of inspections and testing activities. The Contractor shall perform system testing to verify compliance with design specifications and performance criteria.

2.12. Punch List & Final Inspections

The Contractor, with input from the Engineering Firm and NOIRlab, shall prepare a list of deficiencies (punch list) and coordinate all correction actions of the contractor(s). The Contractor, in consultation with NOIRLab, shall verify substantial completion, final inspections, and sign-off from relevant authorities.

2.13. Certificates

The Contractor, upon completion of the project, shall certify to the best of their professional knowledge that the installation conforms to the approved plans, specifications, and shop drawings.

2.14. Closeout

The Contractor, in consultation with NOIRLab, shall develop a detailed plan of closeout activities in compliance with the contract documents. The plan shall include a closeout schedule, inspections, testing, start-up procedures, warranty processing, and training. Contractor shall assist NOIRLab in coordinating these closeout activities, as well as the completion of corrections of deficiencies, receipt

of final submittals, and resolution of all change orders before the application for payment of retainage. Once these have all been completed to the satisfaction of the Owner, Contractor shall coordinate the handover of the operational system to NOIRLab. The Contractor shall maintain a complete set of red-line as-built drawings and submit them electronically in PDF and native CAD format. Final payment will not be issued until approved Record Documents, O&M manuals, training, and the completed punch list are received and accepted.

2.15. Contractor Use of Premises

The Contractor shall coordinate site access, storage areas, staging, and work hours with the Facilities Manager. Work hours are generally 8:00 AM – 4:00 PM. After-hours work, shutdowns, or access to secured areas require written approval at least 7 days in advance. The Contractor shall not use the facilities for storage or meetings without prior approval.

2.16. Final Cleaning

The Contractor shall perform final cleaning of all areas impacted by the work, including cleaning any areas impacted by the work and properly removing construction and hazardous debris.

2.17. Applications for Payment

Monthly applications for payment shall be submitted using AIA G702 and G703 forms or an approved equivalent. Payment for off-site stored materials will be permitted only upon submission of documentation showing proof of ownership, insurance, detailed inventory, and bonding of the storage facility. The Owner reserves the right to reject any unsupported claim for payment.

3. Deliverables

The following deliverables will be provided in addition to Scope of Work above:

3.1. Work Plan and Procedures

- Project Schedule and Updates
- Work Plan: Step-by-step work plan outlining the site remediation and painting processes, emphasizing safety and feasibility.
- Health and Safety Plan: Comprehensive health and safety plan, including PPE requirements, safety procedures, fall protection, and a plan for working at heights. All plans shall comply with all applicable codes and standards and the requirements detailed in the *Safety Parameters for the Mayall Telescope* document.
- Quality Control Plan: Plan for ensuring quality throughout the remediation process,

including inspection and testing protocols.

- Contamination Control Plan: Plan for ensuring hazardous materials and/or waste are appropriately contained and disposed of throughout the project, per standard and local regulations.

3.2. Long-Term Operation & Maintenance Plan and Warranties:

- Long-term operation and maintenance plan for the exterior remediation, including detailed guidelines for routine inspections and maintenance of the sealant and paint systems.
- Procedures for addressing potential issues, such as reapplication of materials or repairs.
- Schedule for periodic reviews and updates to the maintenance plan.
- Include all warranties on work and products.
- Final Closeout Package, including all redlines, RFIs, and product submittals

3.3. Document Delivery Requirements

General Contractor shall provide NOIRLab with all documents generated in support of the project including meeting minutes, review meetings, as-built drawings, redlines, submittal comments, contractor site meetings, and RFIs. Documentation shall be provided in the following formats:

- PDF file format
- Native File Format (MS Office, Google Doc, Autocad 2d…)
- Contractor shall upload all project digital files to an agreed cloud storage space

4. Acceptance

Acceptance of the work will be based on the following criteria:

- Completion of all tasks outlined in the scope of work.
- Delivery of all specified deliverables.
- Verification that the implemented solution and workmanship meet all performance requirements.

5. Project Management

The Contractor shall provide project management for the duration of the project. This will include regular communication and meetings with the project stakeholders, scheduling of site visits and assessments, and coordination of all project activities.

5.1. Reporting and Meeting Requirements

Milestone Meetings: Contractor, at a minimum, shall prepare, present, and perform the following milestone reviews and walkthroughs:

- Pre-Implimentation
    1. Within 10 business days of Notice to Proceed (NTP).
    2. Required attendees: Contractor's PM, superintendent, major subcontractors, and Owner representatives.
    3. The contractor shall provide the following:
        a. Preliminary project schedule
        b. Draft submittal log
        c. Site logistics plan
        d. Safety plan
        e. Communication plan
        f. Utility coordination plan
        g. Waste Management plan
- Site Mobilization Walkthrough
    1. Prior to the start of work.
    2. Reviews laydown areas, temporary utility connections, hours of work, site access, and protection of adjacent operations.
    3. Final approval of safety signage and barricading plan.
- On-site Observation
    1. The Contractor shall participate in regularly scheduled Observation Meetings throughout the project. These meetings serve as a platform for field-level coordination, issue resolution, quality assurance, and verification of schedule progress. They are distinct from milestone meetings and shall occur at intervals sufficient to support successful project delivery.
    2. Meetings shall be held weekly on a consistent day and time, unless otherwise directed by the Owner's Representative.
    3. Additional site meetings may be scheduled by the Owner, Project Manager, or Technical Representative to address emergent issues.
    4. Required Attendees: Contractor's Superintendent and/or Project Manager (required), Subcontractor representatives (as applicable), Owner's

Representative or designee, Site Facilities Manager, Other stakeholders as identified by the Owner

5. Documentation: Meeting minutes shall be prepared by the Contractor and distributed to all participants within 48 hours. Outstanding action items shall be carried forward and tracked until closed.
6. Observations and Non-Conformance: The Owner reserves the right to issue Field Observation Reports (FORs) or Non-Conformance Reports (NCRs) during or following site meetings. The Contractor shall respond in writing within five (5) calendar days with corrective actions.

- Substantial Completion Walkthrough
    1. Scheduled when the Contractor considers the project ready for substantial completion declaration.
    2. Generates a punch list and determines readiness for handover.
- Final Inspection
- On-site Closeout
    1. Occurs after punch list completion.
    2. Confirms receipt of as-builts, warranty documents, testing reports, and all closeout deliverables.

Job Site Meetings: The Contractor, in consultation with NOIRLab, subcontractors, and consultants, shall organize and conduct meetings as necessary at the job site to discuss job progress, problem resolution, code compliance, and decision-making. The contractor shall prepare and distribute accurate meeting minutes within three (3) business days after the meeting, or sooner if time-critical.

6. Assumptions

The following assumptions are made in relation to this project:

- The site will be made available to the contractor for all necessary visits and assessments. The project will be occurring on an operational telescope. Coordination with the project team is critical to ensure telescope operations are minimally affected.
- General Contractor shall have access to all necessary documentation and approvals required for the project, where available.
- All work will be completed in compliance with applicable codes and regulations.

7. Breakdown

Please break down the bids into the following line items:

- Labor Costs:
  - Breakdown of labor costs.
- Material Costs:
  - Detailed listing of materials required for the project, including any necessary testing and analysis.
- Equipment Costs:
  - Any specialized equipment or tools necessary for the project and their costs.
- Change Order Costs:
  - Any costs and/or fees associated with implementing a change order.
- Administrative Costs:
  - Any overhead costs and administrative fees associated with the project.
- Timeline:
  - Proposed timeline for the project, including any phases or milestones.
- Invoice Schedule:
  - Your proposed invoice schedule, outlining when and how invoices will be sent to NOIRLab throughout the project.

Further details can be found in the *Mayall Exterior Bid Proposal Comparison* document in *Appendix A*.

Appendix A. Applicable Reference Documents

Document Number / Link / Identifiers	Document Title
NSF RIG 2021.pdf	NSF Research Infrastructure Guide
Drawings	Historical Drawings and As-Builts Folder
26 0130 100% Construction Docs a…	Construction Drawings and Specifications Folder
2376 Final Report EHS Evaluation …	Exterior Testing Report
Weather Records	Weather Records
TON Solid Waste Management Cod…	Tohono O'odham Solid Waste Management Code
2100-SOM5947-A-E-10.pdf	Elevation and Section Drawing
Safety Parameters for Mayall Teles…	Safety Parameters for the Mayall Telescope
Mayall Exterior Bid Proposal Comp…	Mayall Exterior Bid Proposal Comparison

Appendix B. List of Acronyms

Acronym	Full Form
ACM	Asbestos-Containing Material
AHJ	Authority Having Jurisdiction
AURA	Association of Universities for Research in Astronomy
CAS	Central Administrative Services (AURA)
CO	Owner's Contract Officer
COS	Center Operations Services
DESI	Dark Energy Spectroscopic Instrument
DOE	United States Department of Energy
EHS	Environmental, Health, and Safety
EL	Elevation
EPO	Environmental Protection Office (TON)
ES	Engineering Services
KPNO	Kitt Peak National Observatory
NOIRLab	National Optical-Infrared Astronomy Research Laboratory
NSF	National Science Foundation
PM	Project Management, Project Manager
PMO	Portfolio Management Office
RFP	Request for Proposal
SOW	Statement of Work
TERO	Tribal Employment Rights Office
TON	Tohono O'odham Nation
TR	Owner's Technical Representative
WBS	Work Breakdown Structure