



MEMORANDUM

April 16, 2026

TO: Maunakea Management Board

FROM: Greg Chun, Executive Director, Center for Maunakea Stewardship (CMS)

SUBJECT: Very Long Baseline Array Facility Repainting and Roof Replacement, CDUP HA 2174, request for concurrence

- Proposal rec'd: 3/30/2026
- Type **A** / B / C
- CMS project #368
- ED review: 3/30/2026
- EC: 4/9/2026
- KKM: 4/2/2026
- MKMB: 4/16/2026
- MKSOA: 5/14/2026

I. Project Description

VLBA has determined facility maintenance to repaint the building exterior and replace the existing roof are urgent and necessary to avoid site damage and water leaks. As the project is limited to like-to-like replacements of the roof and painting, the following land use is determined to apply: HAR §13-5-22, P-8, Structures and Land Uses, Existing (A-1) *Minor repair, maintenance, and operation to an existing structure, facility, use, land, and equipment... that involves mostly cosmetic work or like-to-like replacement of component parts, and that results in negligible change to or impact to land, or a natural and cultural resource.* No other work is involved.

II. Historical and Cultural Resources Identified

The project site is within the Mauna a Wākea Traditional Cultural Property, listed in 2023 as a State Inventory of Historic Places (SIHP) site #50-10-23-31382, and the Mauna Kea Traditional Cultural Property, listed in 2025 on the National Register of Historic Places.

III. Impacts Identified

The project is strictly limited to the infrastructure of the support building, using like-to-like paint color and roofing materials replacement. No historic or cultural resources, including any viewplanes or oceanic gridlines, will be impacted. CMS also does not anticipate any negative adverse impact on hydrological, geological, or recreational resources. The project will not extend or enlarge the VLBA footprint and does not change the permitted use of the parcel.

IV. Recommended Mitigation

CMS recommends Best Management Practices and other project conditions be adhered to in carrying out this work. The project will not proceed unless and until the Office of Conservation and Coastal Lands (OCCL) issues concurrence. VLBA will comply with any and all conditions.



V. Comprehensive Management Plan Compliance

The request is consistent with the 2022 Comprehensive Management Plan (CMP), approved by the Board of Land and Natural Resources. In fulfillment of the CMP's community review requirements, the proposed use was presented to committees as follows:

- Kahu Ku Mauna (KKM) Council, April 2, 2026. KKM reviewed due to the project need assessment occurring after submittal of the 2026-2028 Three-Year Plans. KKM expressed it was important that VLBA carry out this proactive maintenance to keep conditions safe for workers, general public, and the āina.
- Environment Committee, April 9, 2026. Comments not available in time for posting of these materials, but will be shared with MKMB.

Following MKMB review, the request will be presented to the Mauna Kea Stewardship and Oversight Authority prior to submittal to the Office of Conservation and Coastal Lands (OCCL) for final approval.

The proposed land is also consistent with UH's General Lease for the Science Reserve (S-4191) and VLBA's sublease, which will keep the property in good working order.

VI. CMS Recommendation, with Mitigation Measures

CMS recommends MKMB approve this request proceed in the review process with the standard project conditions in the attached list. The project will not proceed unless OCCL concurs.

Facility Project Proposal for the UH-Managed Lands

for projects anticipated to be classified as having “Minimal Impact”

Proposals due by the 15th monthly

Please mark all that apply to your project

No Project was reviewed in a 3-Year Plan

Yes Project is a CMP, lease, or sublease compliance measure (e.g., keeps the site in safe working order)

No Project involves heavy machinery

No Project requires ground disturbance such as digging or trenching

No Project will result in a change to the facility footprint

No Project affects a viewplane (e.g., starline or oceanic gridline)

Facility Name

Maunakea Very Long Baseline Array (VLBA)

Brief Descriptive Title of Project

The National Radio Astronomy Observatory (NRAO) operated by Associated Universities, Inc. (AUI), constructs and operates facilities for research in radio astronomy, under contract with NSF. This site is one of ten radio telescope sites across the US, known collectively as the Very Long Baseline Array (VLBA). Each site has a Station building constructed of CMU block with a 4/12 pitch gable roof consisting of a plywood deck and a standing seam metal roof covering with gutters on the front side and short parapet style gables at each end with cap flashing that matches the roof. NRAO is requesting approval to conduct needed maintenance of its Maunakea facility, by replacing the existing roof cover and repainting the exterior of the station building. Project is composed of like-to-like replacements and there will be no substantial adverse visible change to the structure.

Project Description

1. All demolished materials will be securely contained in the 20' shipping container and shipped back to the VLBA's administrative headquarters in New Mexico for disposal once all work is completed.
2. Removal of all existing standing seam metal covers, gutters, flashings, etc.
3. Removal and reinstallation of the existing roof grounding system, including cables, lightning rods and associated fasteners. Reinstallation shall include adequate fasteners and sealants as needed to ensure a watertight seal.
4. Install self-adhering underlayment over the top of the eaves and roof deck (minimum 5' wide x full building length minimum) and a synthetic underlayment over the remaining surface.
5. Install new continuous sheets of white Commercial grade “R” panel roof covering utilizing the proper fasteners with the proper end wall flashing, ridge caps, and parapet wall flashing and caps.
6. Old paint will be scraped with hand scrapers and wire brushes. Paint samples are under test for lead content. Appropriate environmental and health precautions will be taken should the paint

contain lead. Paint removal will not be performed at times when wind risks dispersal of removed materials. NRAO will comply with CFRs relevant to painting:

- a. Title 29, Code of Federal Regulations, section 1926.62, Lead Exposure in Construction; Interim Final Rule.
 - b. Title 29 Code of Federal Regulations Part 1910.134, Respiratory Protection.
 - c. Title 40 Code of Federal Regulations Part 61, National Emissions Standards for Hazardous Air Pollutants.
 - d. Title 40 Code of Federal Regulations Part 745, Lead; Requirements.
7. The ground will be covered with tarps (3 each 15' x 20") on the side undergoing active work. Tarps to be moved as needed to catch paint flakes and debris generated while roof work and paint preparation activities are underway.
 8. New exterior paint coatings will be applied to the soffits and fascia by hand utilizing brushes and rollers only. New paint will be color-matched to the existing paint and will be lead-free.

Project materials:

- 32 sheets of "R" panel; each sheet is 15'4" long x 36" wide
- 32 inner and 32 outer closures
- 1500 wood screws with washers for fastening sheet to the deck
- Two each 4'x8'x3/4" CDX plywood for replacement of rotten deck spots (will only be used if needed)
- 1000 lap screw for sheets
- 50' of ridge cap
- 100' drip edge
- 70' end wall flashing
- 80' wall cap flashing
- Two each gravity roof vents
- One silicon pipe flashing
- Three rolls of deck underlayment
- Six rolls of self-adhesive underlayment
- Five (5) gallons of water-based exterior paint for trim (soffits and fascia)
- Ten (10) gallons of water-based exterior paint for walls

Example before (left) and after (right) photos from the Fort Davis VLBA site roof replacement are shown following.



Image 1-2: (L) Fort Davis site, before roof replacement. (R) Fort Davis, after roof replacement.

Proposed Commencement Date

17 Aug 2026 (nominal). Completion of work by Sep 30 is strongly desired.

Proposed Completion Date

28 Aug 2026 (nominal).

Estimated Project Cost

Estimated total project cost including materials, travel and shipping is \$40,000.

Total size / area of proposed use

All work activities will be within 10 feet surrounding the station building and on top of the VLBA station building. The container will remain within the VLBA fenced area for the duration of the work.

Estimated total roof area: 1,472 sq ft of new material to replace between 1,100-1,200 sq of existing roofing. Some of the new roof will overlap and we expect some loss due to cutting.

Estimated total area to repaint: 1,750 sq ft

Project Purpose and Need

A facilities condition assessment was performed across the ten VLBA sites. Multiple sites showed deterioration of the roof consistent with the building age (35 years or more). Necessary repairs made to some of the VLBA sites some sites raised increased concern that roof panels could be dislodged by strong wind and allow significant water intrusion. NRAO management deemed the repairs urgent enough to fast-track array-wide roof repairs and not wait for the next year. As of this writing, roof replacement has been completed at four VLBA sites with the goal of replacing all ten roofs by the end of 2026.

Has professional peer-review occurred

Internal project review by staff, prospective contractors

Are there any related ongoing, pending, or planned projects associated with this submission?

No

Description of the Project

Location

All work will take place within the VLBA site within the property fence. The VLBA site is below the Mauna Kea summit on a spur road that runs NE from the Mauna Kea Access Road (see left image below). The site building is highlighted in green (right image). Images courtesy Google.



Images 3-4.

Description of the process of completing the project

Four individuals will be onsite to complete the work. Three will actively work on roof while the fourth will set up tarps, bag and dispose of all debris, and keep the work site clean throughout the site work. Once most of the roof demolition and preparatory work is complete, the fourth person can transition to preparing the soffits and walls for painting. All tools and materials will be shipped from New Mexico inside a 20' container that will be delivered to the VLBA site. Upon completion, all the debris and unused material will be placed back in the container for shipment back to NM.

Nominal project timeline by day:

1. Strip and paper front
2. Strip and paper back
3. Sheet front
4. Sheet the back
5. Install end wall flashings and ridge cap
6. Finish wall and soffit prep
7. Paint walls
8. Paint soffit and install door locks
9. Spare day for weather or if work is cut short due to personnel getting elevation sickness.

Who will do the work?

Work will be carried out by four NRAO employees. All will have had experience performing identical work at other VLBA sites prior to this work.

Equipment & Transportation

- One crew cab truck (or similar) and trailer for delivery
- 20' shipping container to store materials, including for offsite disposal. The container, and possibly the trailer that will be used to deliver the container, will be left at the site for the duration of the project (no more than 30 days)
- Ladders will be used for roof access.
- No large construction equipment (e.g., bucket truck) will be require

Measures to protect the environment and/or mitigate impacts

Impacts

Impacts to existing conditions.

Compliance with Lease, Sublease, or Comprehensive Management Plan (CMP)

The project is a sublease compliance action to maintain the site in good working order.

Identify other required or associated permits

N/A

Community Benefits

Benefits to other Maunakea entities and/or global astronomy community

The project will maintain VLBA operations which provide geodetic data for both planetary needs and the wider astronomical community. This data includes measurements of the earth's surface

including its curvatures and irregularities, its orientation in space, and the gravity field, which assist in mapping shorelines, determining other terrestrial boundaries, and improving transportation and navigational safety.

Benefits to the Hawaii Island community

Continued provision of accurate geodetic and astronomical data.

Will data, publications, or other products be free and available to the public?

N/A

For internal use only by CMS

Review checklist

Staff review and report

n/a Outside agency review or approval required

Environment committee, if environmental impacts are anticipated

Kahu Ku Mauna, if cultural impacts are anticipated and KKM requested consultation, or the project was not included in a 5YP or 3YP

Maunakea Management Board

Mauna Kea Stewardship and Oversight Authority

Prepare to Start the Project

- Identify and comply with other permit requirements, such as County of Hawai'i building permits or Department of Land & Natural Resources permits (see *both*/any applicable DLNR permit and [HAR §13-5-42 Standard conditions](#)).
- Use of real-time GPS during any surveying or equipment operation requires advance written approval from CMS and the Institute for Astronomy. GPS use should be requested at least four (4) weeks prior to the proposed activity.
- Any required Best Management Practices, Communication Plans, contract scope questions, etc. must be finalized and approved by CMS prior to final approval.
- No project work may commence before CMS provides a final, written notice explicitly stating whether the project is approved to commence (i.e., issue a "Notice to Proceed"). The Notice to Proceed will include any additional, project-specific conditions.
- Project approval may not be transferred or assigned without prior authorization. A copy of the approval/permit must be present on-site and available for review at all times while working on UH-managed lands.
- Applicant shall comply with all actions and measures described in the proposal, including (community) benefits, CMP compliance list, and mitigation measures.

Notifications

- Applicant may request to arrange a pre-construction meeting with CMS before work commences. These meetings review orientation content, implications of project non-compliance, project-specific concerns regarding resource protection, health and safety, visitor and/or traffic impacts, etc. Meetings may be held in person or via phone, webinar, or other means.
- Notify CMS in writing via email to cmsshilo@hawaii.edu at least five (5) days prior to beginning field work on UH-managed lands (Halepōhaku, Road Corridor, Maunakea Science Reserve) with the following:
 - Identify the date that onsite work will commence.
 - Identify by name-of-entity all observatories, contractors, vendors, suppliers, etc. anticipated to be associated with and substantively present on UH-managed lands for the project.
 - Identify the individual(s) who will be coordinating all invasive species inspections.
 - Attest that the observatory or relevant entity will ensure compliance with all permit conditions and communicate with CMS if there is any uncertainty.
 - Notify CMS in writing of any other entities responsible for elements of compliance.
 - Attest that all individuals anticipated to be associated with the project have completed the Maunakea User Orientation.
 - CMS is not liable or responsible for delays due to inadequate or late submissions.

Onsite Activity

General

- Use of lighting anytime between sunset to sunrise is prohibited unless described in the project proposal and approved.
- Use of cellphones, other than in airplane mode, is prohibited except in case of emergency.

- Placement of permanent markers, monuments, mag nails, or survey pins, etc. is not allowed without explicit prior approval from CMS (and the State if required). ALL surveyors' work must be shared with CMS in digital format with coordinate info stored in and using a common, transferrable coordinate reference system such as "State Plane Coordinates (NAD83), Hawai'i Zone 1".
- Allow CMS Rangers to visit and monitor activities.

Transportation and Motorized Equipment

- No use of mechanized equipment is allowed unless authorized by this permit.
- 4-wheel-drive required for travel above Halepōhaku.
- Large, heavy, non-4-wheel-drive or oversized loads must submit notification to the Maunakea Road Conditions listserv, MK-ROAD-CONDITIONS@lists.hawaii.edu, at least one day prior to transit. Loads requiring an escort on public roadways must have this escort accompany them to the final destination. Projects failing to submit notification or arrange for escort to the summit may be denied entry to Halepōhaku or above.
- During public closures of the Summit Access Road, vehicle access above Halepōhaku is limited to explicitly-marked observatory, CMS, federal, or state of Hawaii vehicles. Vehicles must be operated by approved employees or representatives on official business and possessing requisite orientation, training, safety, and rescue supplies.
- Motorized equipment, when stationary, must have a drain-pan in place suitable for catching fuel or fluid leaks.

Debris Prevention and Severe Weather Concerns

- Ensure that any debris, tools and equipment are secured to avoid becoming windblown and are properly stored at the end of each day.
- Projects occurring in the summit region must verify that temporary and permanent infrastructure and improvements can sustain 120 MPH winds and severe weather.

Environmental Concerns

- All perishable items including food and food containers/wrappers must be removed from the site daily and properly disposed of.
- Properly dispose of all waste material.
- Federal law prohibits feeding or any "taking" (e.g., harassing, harming, killing) of endangered species, including the following which may occur on Maunakea. Employ the following Best Management Practices for species protection:
 - Nēnē, Hawaiian goose (*Branta sandvicensis*). If a nēnē appears within 100 feet (30.5 meters) of ongoing work, all activity shall be temporarily suspended until the animal leaves the area of its own accord.
 - Seabirds, including the endangered Hawaiian petrel (*Pterodroma sandwichensis*)
 - Use red light bulbs outside to the maximum practicable extent.
 - Fully shield outdoor bulbs so the light is only visible from below.
 - Install motion sensors or turn off lights when human activity is not occurring in the area.
 - September-December: Avoid nighttime construction.
 - 'Ōpe'ape'a, Hawaiian Hoary Bat (*Lasiurus cinereus semotus*)
 - Avoid radio-frequency emissions where 'ōpe'ape'a may be present.
 - No barbed-wire fencing allowed.
 - June-November: Do not trim, remove, or disturb trees over fifteen (15) feet in height.

Invasive Species Prevention

- Employ invasive species prevention best practices, including inspections of materials by a DLNR-approved biologist, as identified in the Maunakea Invasive Species Management Plan, prior to entering UH-managed lands.
 - Inspections can only occur at locations where landowners have given permission (i.e. facilities, baseyards, and vendor locations).
 - Inspections shall not occur on/along the Maunakea lands, at State or County parks, along public roadsides, or on Department of Hawaiian Homelands lands.

Upon Project Completion

- The project must be completed within the time frame specified in the proposal and, when applicable, as specified by DLNR. Projects that cannot be completed within this timeframe are not allowed to continue (or commence) without explicit prior written approval from CMS.
- Notify CMS in writing when field activity associated with the project is completed.
- Unless otherwise stated in the proposal, copies of all data, field notes, photos, log books, collected specimens, and other forms of documentation will be shared with CMS for future, unrestricted use by CMS or its designee. All geospatial data, metadata or applications must be in a format compatible with CMS GIS software or other industry standard identified in advance.
- Collected specimens that are not consumed in analysis will be returned to CMS unless otherwise specified.
- Provide CMS with electronic and paper copies of all publications resulting from the work. When applicable, annual, final reports must be submitted to CMS.
- When applicable, a brief, approximately 1-page, non-technical summary suitable for public outreach (school groups, community meetings, newsletter articles, etc.) must be provided to CMS within 90 days of project completion or publication. Photos and illustrations are encouraged.