



UNIVERSITY of HAWAI'I*at HILO
CENTER FOR MAUNAKEA
STEWARDSHIP

August 30, 2022

Mary Alice Evans, Director
Office of Planning and Sustainable Development
Environmental Review Program
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility
Maunakea, Hāmākua District, Island of Hawai'i
Tax Map Key (TMK): (3) 4-4-015:012 (por.)
Publication of Draft Environmental Assessment and Anticipated Finding of
No Significant Impact**

Dear Director Evans,

With this letter, the University of Hawaii at Hilo hereby transmits the Draft Environmental Assessment for the proposed New Educational Telescope Facility project for publication in the next available periodic bulletin, *The Environmental Notice*.

In addition to this letter, we are submitting the electronic version of the Environmental Review Program Publication Form and a PDF formatted electronic copy of the Draft EA and Anticipated Finding of No Significant Impact through the online submission platform.

If there are any questions, please feel free to contact me at (808) 956-5640 or by email at gchun711@hawaii.edu.

Sincerely,

A handwritten signature in black ink, appearing to read "Gregory Chun".

Gregory Chun, Ph.D.
Executive Director
University of Hawai'i at Hilo
Center for Maunakea Stewardship

640 North A'ohōkū Place
Hilo Hawai'i 96720
(808) 933-0734

cmshilo@hawaii.edu

From: webmaster@hawaii.gov
To: [DBEDT OPSD Environmental Review Program](#)
Subject: New online submission for The Environmental Notice
Date: Tuesday, September 13, 2022 12:10:37 PM

Action Name

University of Hawaii at Hilo New Educational Telescope Facility

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (2) Propose any use within any land classified as a conservation district

Judicial district

Hāmākua, Hawai'i

Tax Map Key(s) (TMK(s))

(3) 4-4-015:012 (por.)

Action type

Agency

Other required permits and approvals

HRS Chapter 6E, Conservation District Use Permit, County Grading Permit, County Building Permit

Proposing/determining agency

University of Hawaii at Hilo Facilities Planning & Construction

Agency contact name

Gregory Chun

Agency contact email (for info about the action)

gchun711@hawaii.edu

Email address or URL for receiving comments

jscheffel@ssfm.com

Agency contact phone

(808) 933-0734

Agency address

640 North Aohoku Place
Hilo, HI 96720
United States
[Map It](#)

Was this submittal prepared by a consultant?

Yes

Consultant

SSFM International, Inc.

Consultant contact name

Jennifer Scheffel

Consultant contact email

jscheffel@ssfm.com

Consultant contact phone

(808) 375-6038

Consultant address

99 Aupuni Street
Suite 202
Hilo, HI 96720
United States
[Map It](#)

Action summary

The University of Hawai'i at Hilo's (UH Hilo) current observatory site on the summit of Maunakea, named Hōkū Ke'a, is targeted for decommissioning by 2023. The UH Hilo Department of Physics and Astronomy needs a state-of-the-art educational telescope for training students and for communicating science to the public. Therefore, UH Hilo is proposing to construct a new educational telescope facility at the Halepōhaku Mid-Level Support Facility on Maunakea.

The Proposed Action includes the construction and operation of a new educational telescope at the existing Halepōhaku Mid-Level Support Facility to support UH Hilo's Department of Physics and Astronomy. Halepōhaku was selected as the proposed site because it provides suitable sky conditions for astronomical observations and is conveniently located. The specific area for the new telescope is currently used for equipment storage.

Reasons supporting determination

The Proposed Action would have short-term and temporary impacts during construction to cultural practices, biological resources, scenic resources, geological resources, water resources, air quality, noise, roadways and traffic, and solid and hazardous waste. BMPs and other measures would be implemented to minimize impacts.

The Proposed Action would have beneficial impacts to education due to the increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy and the community, as well as for communicating science to the general public.

Please see Section 5.1 of the Draft EA for a discussion of the Significant Criteria.

Attached documents (signed agency letter & EA/EIS)

- [220829-UHH-NET_DraftEA.pdf](#)
- [220829-NET_DraftEA_Transmittal_Signed.pdf](#)

Action location map

- [Project-Area.shp.zip](#)

Authorized individual

Jennifer Scheffel

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

September 2022

Draft Environmental Assessment

University of Hawai'i at Hilo

New Educational Telescope Facility

Prepared for University of Hawai'i at Hilo
Prepared by SSFM International, Inc.



UNIVERSITY
of HAWAII[®]
HILO

SSFM
International

This page intentionally blank.

Draft Environmental Assessment

University of Hawai'i at Hilo New Educational Telescope Facility Halepōhaku, Island of Hawai'i, Hawai'i

Prepared for:

University of Hawai'i at Hilo Facilities Planning & Construction



Prepared by:

SSFM International, Inc.



September 2022

This page intentionally blank.

Project Summary

Project Name	University of Hawai'i at Hilo New Educational Telescope Facility
Location	Halepōhaku, Island of Hawai'i, Hawai'i
District	Hāmākua
Project Site Tax Map Key	(3) 4-4-015:012 (por.)
Landowners	State of Hawai'i
Project Site Existing Uses	Equipment storage
State Land Uses	Conservation
Proposed Action	<p>The University of Hawai'i at Hilo's (UH Hilo) current observatory site on the summit of Maunakea, named Hōkū Ke'a, is targeted for decommissioning by 2023. The UH Hilo Department of Physics and Astronomy needs a state-of-the-art educational telescope for training students and for communicating science to the public. Therefore, UH Hilo is proposing to construct a new educational telescope facility at the Halepōhaku Mid-Level Support Facility on Maunakea.</p> <p>The Proposed Action includes the construction and operation of a new educational telescope at the existing Halepōhaku Mid-Level Support Facility to support UH Hilo's Department of Physics and Astronomy. Halepōhaku was selected as the proposed site because it provides suitable sky conditions for astronomical observations and is conveniently located. The specific area for the new telescope is currently used for equipment storage.</p>
Anticipated Impacts	<p>The Proposed Action would have short-term and temporary impacts during construction to cultural practices, biological resources, scenic resources, geological resources, water resources, air quality, noise, roadways and traffic, and solid and hazardous waste. BMPs and other measures would be implemented to minimize impacts.</p> <p>The Proposed Action would have beneficial impacts to education due to the increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy and the community, as well as for communicating science to the general public.</p>
Proposing Agency	University of Hawai'i at Hilo Facilities Planning & Construction
Anticipated Determination	Finding of No Significant Impact (FONSI)
Project Site Permits/ Approvals Required	See Table 1

EA Preparer SSFM International
 99 Aupuni Street, Suite 202
 Hilo, Hawai'i 96720
 Contact: Jennifer Scheffel
 (808) 356-1273

Consultations See **Section 6.0**

Table of Contents

1.0	PROJECT DESCRIPTION	1
1.1	INTRODUCTION.....	1
1.2	PROJECT BACKGROUND.....	1
1.3	PROJECT LOCATION	2
1.4	PURPOSE AND NEED.....	4
1.4.1	<i>Purpose of the Proposed Action.....</i>	<i>4</i>
1.4.2	<i>Need for the Proposed Action.....</i>	<i>4</i>
1.5	PROJECT SCHEDULE	5
1.6	PERMITS AND APPROVALS WHICH MAY BE REQUIRED FOR THE PROPOSED ACTION	5
1.7	REQUIREMENTS UNDER THE MAUNAKEA CMP.....	6
2.0	PROPOSED ACTION AND ALTERNATIVES	9
2.1	PROPOSED ACTION.....	9
2.2	NO-ACTION ALTERNATIVE	10
2.3	ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR FURTHER ANALYSIS.....	10
3.0	AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND AVOIDANCE AND MINIMIZATION MEASURES	13
3.1	CULTURAL PRACTICES AND BELIEFS.....	13
3.1.1	<i>Affected Environment.....</i>	<i>13</i>
3.1.2	<i>Potential Impacts.....</i>	<i>19</i>
3.1.3	<i>Avoidance and Minimization Measures.....</i>	<i>20</i>
3.2	ARCHAEOLOGICAL AND HISTORIC RESOURCES.....	20
3.2.1	<i>Affected Environment.....</i>	<i>20</i>
3.2.2	<i>Potential Impacts.....</i>	<i>21</i>
3.2.3	<i>Avoidance and Minimization Measures.....</i>	<i>21</i>
3.3	BIOLOGICAL RESOURCES.....	22
3.3.1	<i>Affected Environment.....</i>	<i>22</i>
3.3.2	<i>Potential Impacts.....</i>	<i>27</i>
3.3.3	<i>Avoidance and Minimization Measures.....</i>	<i>28</i>
3.4	SCENIC RESOURCES	29
3.4.1	<i>Affected Environment.....</i>	<i>29</i>
3.4.2	<i>Potential Impacts.....</i>	<i>29</i>
3.4.3	<i>Avoidance and Minimization Measures.....</i>	<i>30</i>
3.5	GEOLOGICAL RESOURCES.....	30
3.5.1	<i>Affected Environment.....</i>	<i>30</i>
3.5.2	<i>Potential Impacts.....</i>	<i>31</i>
3.5.3	<i>Avoidance and Minimization Measures.....</i>	<i>33</i>
3.6	WATER RESOURCES.....	34
3.6.1	<i>Affected Environment.....</i>	<i>34</i>
3.6.2	<i>Potential Impacts.....</i>	<i>34</i>
3.6.3	<i>Avoidance and Minimization Measures.....</i>	<i>36</i>
3.7	AIR QUALITY	36

3.7.1	<i>Affected Environment</i>	36
3.7.2	<i>Potential Impacts</i>	37
3.7.3	<i>Avoidance and Minimization Measures</i>	38
3.8	CLIMATE AND CLIMATE CHANGE	39
3.8.1	<i>Affected Environment</i>	39
3.8.2	<i>Potential Impacts</i>	39
3.8.3	<i>Avoidance and Minimization Measures</i>	40
3.9	NOISE	40
3.9.1	<i>Affected Environment</i>	40
3.9.2	<i>Potential Impacts</i>	41
3.9.3	<i>Avoidance and Minimization Measures</i>	42
3.10	ROADWAYS AND TRAFFIC	43
3.10.1	<i>Affected Environment</i>	43
3.10.2	<i>Potential Impacts</i>	43
3.10.3	<i>Avoidance and Minimization Measures</i>	44
3.11	SOCIOECONOMICS	44
3.11.1	<i>Affected Environment</i>	44
3.11.2	<i>Potential Impacts</i>	44
3.11.3	<i>Avoidance and Minimization Measures</i>	46
3.12	PUBLIC FACILITIES AND SERVICES	46
3.12.1	<i>Affected Environment</i>	46
3.12.2	<i>Potential Impacts</i>	47
3.12.3	<i>Avoidance and Minimization Measures</i>	47
3.13	NATURAL HAZARDS	48
3.13.1	<i>Affected Environment</i>	48
3.13.2	<i>Potential Impacts</i>	50
3.13.3	<i>Avoidance and Minimization Measures</i>	50
3.14	SOLID AND HAZARDOUS WASTE	50
3.14.1	<i>Affected Environment</i>	50
3.14.2	<i>Potential Impacts</i>	51
3.14.3	<i>Avoidance and Minimization Measures</i>	51
3.15	SECONDARY AND CUMULATIVE IMPACTS	52
3.15.1	<i>Secondary Impacts</i>	52
3.15.2	<i>Cumulative Impacts</i>	52
4.0	RELATIONSHIP TO LAND USE PLANS AND POLICIES	53
4.1	STATE OF HAWAI'I PLANNING DOCUMENTS	53
4.1.1	<i>The Hawai'i State Plan</i>	53
4.1.2	<i>State Land Use Law</i>	60
4.1.3	<i>Hawai'i Coastal Zone Management Program</i>	63
4.2	COUNTY OF HAWAI'I PLANNING DOCUMENTS	69
4.2.1	<i>Hawai'i County General Plan</i>	69
4.2.2	<i>Hawai'i County Zoning Code</i>	74
4.2.3	<i>Hāmākua Community Development Plan</i>	74
4.2.4	<i>Special Management Area</i>	74

5.0	FINDINGS AND CONCLUSIONS	75
5.1	SIGNIFICANCE CRITERIA	75
5.2	ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT	78
6.0	AGENCY AND PUBLIC CONSULTATION	79
6.1	PRE-ASSESSMENT CONSULTATION.....	79
6.2	PUBLIC OUTREACH VIRTUAL ENGAGEMENT	79
7.0	REFERENCES	81

List of Figures

Figure 1. Project Location Map	3
Figure 2. Conceptual Rendering of Clamshell Dome	9
Figure 3. Rendering of Proposed Dome Structure Adjacent to Dorm A.....	30
Figure 4. Geologic Units	32
Figure 5. Aquifers	35
Figure 6. Hawai'i Maximum Permissible Sound Levels for Various Zoning Districts	41
Figure 7. Flood Hazard Zones.....	49
Figure 8. State Land Use Districts	61
Figure 9. Conservation District Subzones	62
Figure 10. Land Use Pattern Allocation Guide Districts.....	73

List of Tables

Table 1. Permits and Approvals Which May Be Required for the Proposed Action.....	6
Table 2. Evaluated Sites for the New Educational Telescopes	11
Table 3. Comments Received and Responses.....	17
Table 4. Mammals Known to Occur or Potentially Occur within the Project area	24
Table 5. Bird Species Known to Occur or Potentially Occur within the Project area	25
Table 7. State of Hawai'i and National Ambient Air Quality Standards.....	37
Table 8. Summary of Applicability of HRS Chapter 226 to the Proposed Action.....	53

List of Photos

Photo 1. Project Location Adjacent to Existing Dorm A..... 2
Photo 2. Aerial photo showing existing equipment storage at the proposed project site 29

Appendices

Appendix A Pre-Final Drawings

Appendix B *Cultural Impact Assessment in Support of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea, Hawai'i Island*

Appendix C *Archaeological Literature Review with Field Inspection in Support of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Maunakea, Hawai'i Island, Hawai'i*

Appendix D *Targeted Soil Screen Report*

Appendix E Pre-Assessment Consultation Comments and Responses

Appendix F *New Educational Telescope Community Outreach Final Report*

Acronyms

%	percent	EAL	Environmental Action Level
°F	degrees Fahrenheit	HAR	Hawai'i Administrative Rules
AAQS	Ambient Air Quality Standards	HDOT	Hawai'i Department of Transportation
ALR	Archaeological Literature Review	HRS	Hawai'i Revised Statutes
ALRFI	Archaeological Literature Review and Field Inspection	ISMP	<i>Maunakea Invasive Species Management Plan</i>
APE	Area of Potential Effect	KKM	Kahu Kū Mauna
bgs	below ground surface	LEI	Lehua Environmental Inc.
BLNR	Board of Land and Natural Resources	mgd	million gallons per day
CCC	Civilian Conservation Corps	MKMB	Maunakea Management Board
CDP	Community Development Plan	msl	mean sea level
CDUP	Conservation District Use Permit	NAAQS	National Ambient Air Quality Standards
CIA	Cultural Impact Assessment	NASA	National Aeronautics and Space Administration
CIP	Capital Improvement Program	NPDES	National Pollutant Discharge Elimination System
CMP	<i>Maunakea Comprehensive Management Plan</i>	NRHP	National Register of Historic Places
CMS	Center for Maunakea Stewardship	OCCL	Office of Conservation and Coastal Lands
CRMP	<i>A Cultural Resources Management Plan for the University of Hawai'i Management Areas on Mauna Kea, Ka'ohē Ahupua'a, Hāmākua District, Hawai'i Island, State of Hawai'i</i>	PCSI	Pacific Consulting Services, Inc.
DLNR	Department of Land and Natural Resources	SHPD	State Historic Preservation Division
DOH	Department of Health	TCP	Traditional Cultural Property
DPW	Department of Public Works	UH	University of Hawai'i
EA	Environmental Assessment	UH Hilo	University of Hawai'i at Hilo
		VIS	Visitor Information Station

This page intentionally blank.

1.0 Project Description

1.1 Introduction

The University of Hawai'i at Hilo's (UH Hilo) current observatory site on the summit of Maunakea, named Hōkū Ke'a, is targeted for decommissioning by 2023. The UH Hilo Department of Physics and Astronomy needs a state-of-the-art educational telescope for training students and for communicating science to the public. Therefore, UH Hilo is proposing to construct a new educational telescope facility at the Halepōhaku Mid-Level Support Facility on Maunakea.

The proposed project requires the preparation of an environmental assessment (EA), because (1) the proposed action involves the use of state lands and state funds pursuant to Hawai'i Administrative Rules (HAR) Section 11-200.1-8, and (2) due to the proposed land use located within the Conservation State Land Use District pursuant to HAR Section 13-5-31.

1.2 Project Background

UH Hilo's current telescope facility site on the summit of Maunakea, named Hōkū Ke'a, is in the process of being decommissioned (i.e., removal and site restoration). That process is scheduled for completion by 2023. The original facility was first developed in the 1960s for use by the National Aeronautics and Space Administration (NASA) and the U.S. Air Force. The University of Hawai'i (UH) acquired the telescope in 1970. In 2003, UH gave control of the telescope to UH Hilo's Department of Physics and Astronomy to train undergraduate students on the instrument. In 2010, both the dome and the old 24-inch telescope was replaced by a 36-inch telescope and renamed Hōkū Ke'a. Although the Hōkū Ke'a telescope was intended to play a critical role in the educational mission of UH Hilo's Department of Physics and Astronomy, it did not achieve satisfactory operational performance and due to design flaws.

UH Hilo opted to replace the faulty telescope with a smaller, more modern telescope in 2013. A new 28-inch telescope, 18-foot dome enclosure, and related instrumentation were financed by the State of Hawai'i through Capital Improvement Project (CIP) funding and delivered to UH Hilo in 2016. Prior to the delivery of the new educational telescope components, the University determined that the Hōkū Ke'a observatory would be one of the five astronomy facilities on Maunakea to be decommissioned. As such, UH Hilo's new educational telescope has not been installed for use. With the decommissioning process of Hōkū Ke'a now underway, UH Hilo aspires to install a new educational telescope to support the educational and research goals of UH Hilo's Department of Physics and Astronomy as discussed in **Section 1.4.2**.

The UH Hilo Astronomy Program requires the new educational telescope facility in order to support its high academic standards and provide competitive education by focusing on modern observational astronomy techniques, effective research support, and communicating science with the general public. Significant observing time with the telescope will also be made available to local schools and the community. The availability of an educational telescope that provides hands-on experience for students enables UH Hilo to better address:

1. **Increasing competition:** The number of Astronomy Bachelor's Degrees granted annually in the USA has tripled since 2000.
2. **Recapturing UH Hilo's niche as providing hands-on student learning:** More worldwide colleges offering astronomy programs are also implementing small, modern telescope facilities.
3. **Adapting to job market:** More hands-on experience, research support or transferrable skills are required from college graduates entering the astronomy job market, which includes engineers, software engineers, telescope operators, data analysts, as well as astronomers.
4. **Outreach efforts:** Communicating science with the general public is fundamental at UH Hilo but is currently limited by resources and an adequate astronomical facility is needed to develop more opportunities.

1.3 Project Location

With the decommissioning process of Hōkū Ke'a underway, UH has determined that a new enclosure to install and operate the 28-inch telescope should be constructed off the summit at Halepōhaku. This site was selected after UH Hilo evaluated 16 site alternatives between 2016 and 2018. The selected site within Halepōhaku provides desirable teaching, access, and astronomical conditions. The area proposed for the new telescope is currently used for equipment storage, and it is shown in **Photo 1**.

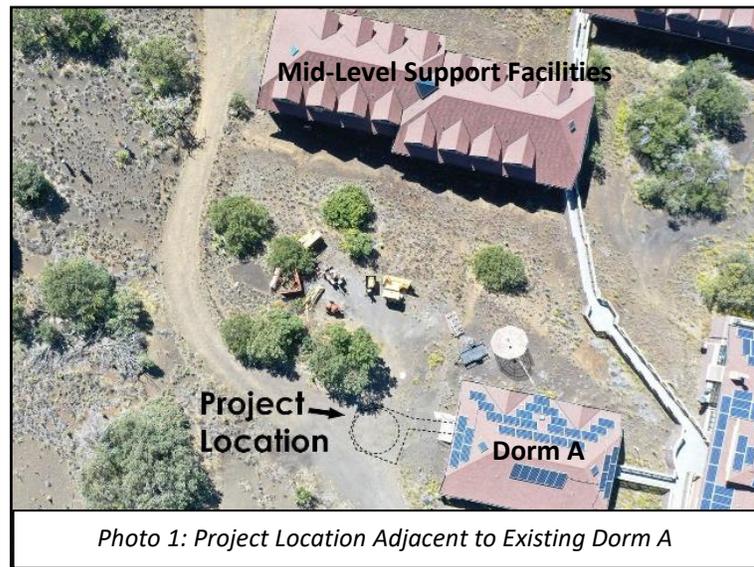
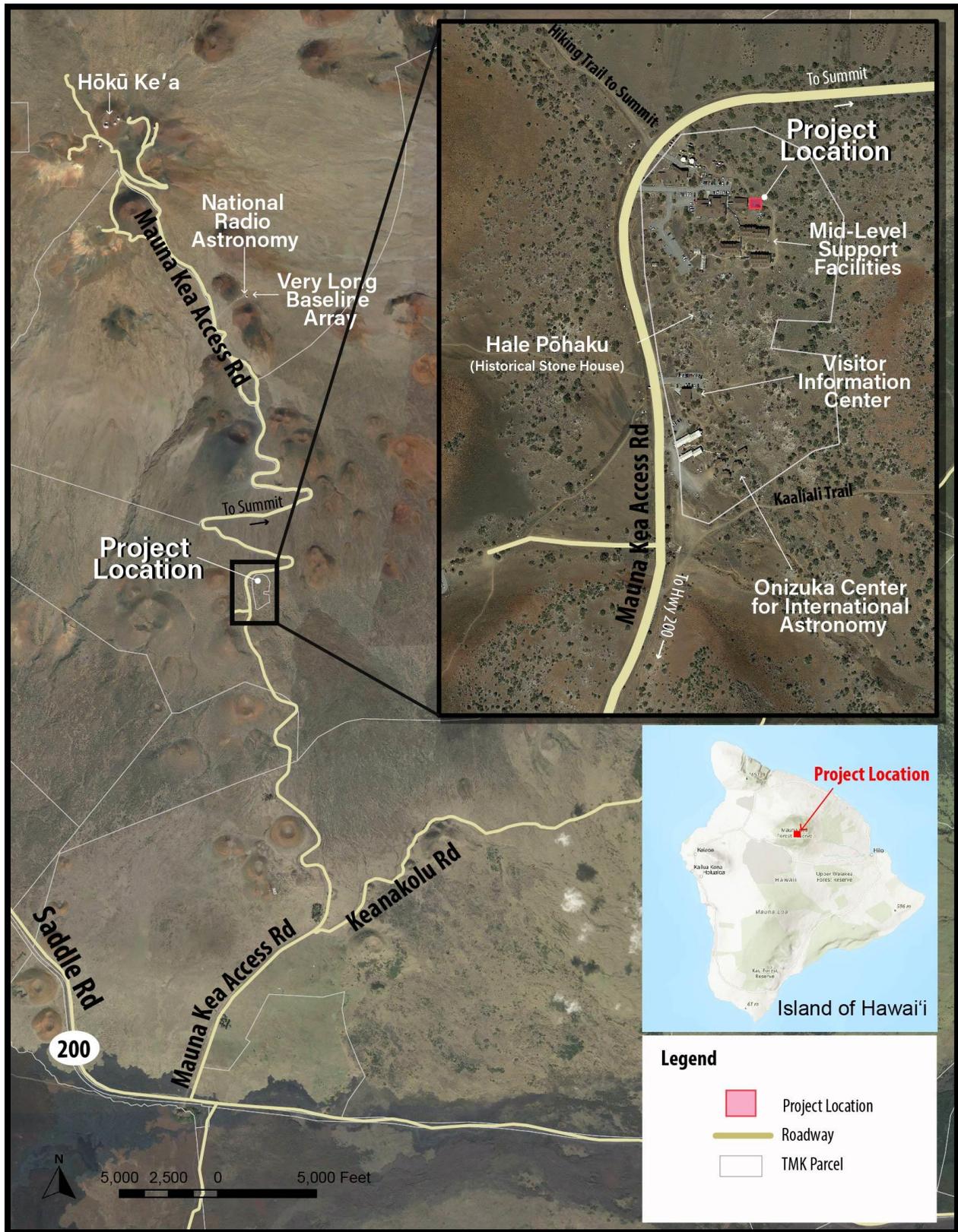


Photo 1: Project Location Adjacent to Existing Dorm A

Halepōhaku, "House of Stone", is located below the summit at 9,200 feet elevation on Maunakea. The name of the site comes from the stone cabins that were built there in the 1930s. The Halepōhaku parcel includes the Mid-Level Support Facility (including a common building, dormitory, and maintenance area), a Visitor Information Station (VIS) with parking for the public, a construction camp, and a staging area.

As a mid-elevation site, Halepōhaku has been used by hunters, hikers, astronomers, technicians, and other visitors to the mauna to acclimatize their bodies to the rarified atmosphere at higher elevations. The Halepōhaku Mid-Level Support Facility provides accommodations used for sleeping, eating, lounging, research support, and minor maintenance functions directly related to telescope operations at the summit. The Maunakea Rangers also use the facility. The Project Area is currently used for equipment storage. The new educational telescope would be supported by existing on-site infrastructure at the Halepōhaku Mid-Level Support Facility.

Figure 1. Project Location Map



1.4 Purpose and Need

1.4.1 Purpose of the Proposed Action

The Proposed Action would be mostly used by UH Hilo and University of Hawai'i Mānoa for their undergraduate astronomy programs, but time would be available for all students across the University of Hawai'i (UH) system. Specifically, the Purpose of the Proposed Action is:

- To conduct scientific research projects led by students,
- To train students in modern observational techniques applied in scientific research,
- To train students in modern telescope operations,
- To support developments in instrumentation and technical projects,
- To support outreach activities and student training in communicating science with the general public, and
- To serve as a bridge between professional astronomy activities on the Big Island and local communities.

UH faculty and students would use the telescope for laboratories and research projects as well as for outreach events and programs involving the community. In addition, the Proposed Action could be used to build scientific and educational collaborations around the world, including other educational institutions and serious citizen astronomers. UH Hilo would work closely with local high schools and the community to develop opportunities in conducting observations with the new educational telescope.

1.4.2 Need for the Proposed Action

The Proposed Action is needed to provide a new educational telescope to support the educational and research goals of UH Hilo's Department of Physics and Astronomy. The UH Hilo Physics and Astronomy programs provide a unique and excellent undergraduate education within the College of Natural Science and Health Sciences. All faculty have active research projects that provide opportunities for students to gain valuable experience through internships and directed-studies courses. The programs are designed to prepare students for a wide range of careers in physics and astronomy, from fundamental research to education and public outreach, from data science to engineering. Many career opportunities are available without the need for graduate studies.

The UH Hilo Astronomy program focuses on training students in modern techniques for observational astronomy and research in physical sciences and data analytics. The program includes basic training with small, portable telescopes to full-blown research and analysis projects done with the large Maunakea observatories. UH Hilo receives a few nights per year on the larger telescopes; this time is mostly used for research projects, not training on operations. The Proposed Action is needed to allow a much more complete training in operations, instrumentation, design and development, as well as in the professional observing process. Smaller but very instructive research projects would also be possible, as well as opening opportunities to communicate science with the general community.

1.5 Benefits of the Proposed Action

The Proposed Action would have beneficial impacts to education due to the increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy. In its current operational concept, a significant amount of observing time with the UH Hilo Educational Telescope would be made available to students and teachers in the State of Hawai'i. Notably, training and educational opportunities would be offered to local teachers, who subsequently could then include observing experiments and other astronomy events related to the Educational Telescope in their own course curriculum. We can also envision special summer school training sessions for Adult Learners interested in astronomy or in acquiring experience in operating a modern telescope. UH Hilo students would be involved in those community opportunities, adding to their own professional training and experience. Local educational organizations would be invited to work closely with UH Hilo and the Educational Telescope leadership in providing these community opportunities.

Specifically, the Proposed Action would provide the following benefits:

- Students would have the opportunity to conduct scientific research projects.
- Students would be trained in modern observational techniques applied in scientific research.
- Students would be trained in modern telescope operations.
- The Proposed Action would support developments in instrumentation and technical projects.
- The Proposed Action would support outreach activities and student training in communicating science with the general public.
- The Proposed Action would serve as a bridge between professional astronomy activities on the Big Island and local communities.
- The Proposed Action could be used to build scientific and educational collaborations around the world, including other educational institutions and serious citizen astronomers.

1.6 Project Schedule

The design phase for the Proposed Action started in August 2020 and is expected to extend through March 2023. Permitting would extend through February 2024. Construction is expected to begin in August 2024 and last approximately four months until December 2024.

1.7 Permits and Approvals Which May Be Required for the Proposed Action

Implementation of the Proposed Action would require coordination with state and county agencies for permits or approvals. The permits and approvals presented in **Table 1** may be required for the Proposed Action. Permit requirements would be determined through continued agency coordination during the Hawai'i Revised Statutes (HRS) Chapter 343 process.

Table 1. Permits and Approvals Which May Be Required for the Proposed Action

Permit or Approval	Description	Regulation(s)	Administrative Authority
Environmental Assessment and FONSI	Required for projects that “trigger” environmental review, including those that propose the use of state or county lands and the use of state or county funds.	<ul style="list-style-type: none"> HRS Chapter 343, Environmental Impact Statements HAR Title 11 Section 200.1, Environmental Impact Statement Rules 	Office of Planning and Sustainable Development, Environmental Review Program
Historic Preservation Review	Required for projects that may affect historic property or a burial site.	<ul style="list-style-type: none"> HRS Chapter 6E 	DLNR, State Historic Preservation Division (SHPD)
Conservation District Use Permit	Required for projects located within the Conservation District	<ul style="list-style-type: none"> HRS Chapter 183C HAR Title 13, Chapter 5 	DLNR-OCCL
County Grading Permit	<p>Required when any one of the following items are exceeded:</p> <ul style="list-style-type: none"> 100 cubic yards of excavation or fill; Vertical height of excavation or fill measured at its highest point exceeds 5 feet; or <p>When the general and localized drainage pattern with respect to abutting properties is altered.</p>	<ul style="list-style-type: none"> Hawai'i County Code, Chapter 10 – Erosion and Sedimentation Control 	County of Hawai'i Department of Public Works (DPW)
County Building Permit	Required for any project that proposes to erect, construct, enlarge, alter, repair, move, convert, or demolish any building or structure in the County.	<ul style="list-style-type: none"> Hawai'i County Code, Chapter 5 – Building 	DPW

1.8 Requirements Under the Maunakea CMP

The Board of Land and Natural Resources (BLNR)-approved management plan for the UH Management Areas, the *Mauna Kea Comprehensive Management Plan (CMP)*, contains a set of management actions designed to protect the natural and cultural resources of Maunakea. As required by the BLNR when it approved the CMP, the Center for Maunakea Stewardship (CMS) submits annual reports on the status of the implementation of the CMP. Contractors, through their construction contracts, must comply with the applicable requirements of the CMP. The following would be implemented as part of the construction of the new educational telescope:

- Maunakea Use Orientation.** Prior to working on the mountain, all personnel associated with any construction project are required to attend a mandatory 45- to 60-minute Maunakea User Orientation to inform them on the natural and cultural resources of Maunakea as well as the

hazards of working on the mountain. All work would be performed in accordance with the principles and frequency established in the Maunakea User Orientation. Any person not behaving in a manner consistent with the principles established in the Maunakea User Orientation would be required to leave the project site.

- **Best Management Practices.** All construction requires the implementation of Best Management Practices (BMPs) approved by both CMS and applicable permitting agencies. The BMPs outlines for the Proposed Action are a combination of the following:
 - BMPs promulgated by CMS for all projects within UH Management Areas on Maunakea and includes both construction and post-construction practices
 - Construction BMPs prepared pursuant to the National Pollutant Discharge Elimination System (NPDES), building, and grading permits.
- **Maunakea Invasive Species Plan.** All construction requires compliance with the Maunakea Management Board (MKMB)-approved *Maunakea Invasive Species Management Plan* (ISMP) (Vanderwoude et.al., 2015). The ISMP details measures to be taken to avoid the introduction and spread of invasive species, such as cleaning and inspection procedures for machinery and materials, maintenance of the construction staging areas, monitoring and control for invasive species, and trash removal. For example, prior to arriving at the UH Management Areas, all construction materials, equipment, crates, and containers carrying materials and equipment would be inspected by a trained biologist selected by CMS and approved by the Department of Land and Natural Resources (DLNR).
- **Construction Monitoring.** All construction requires an on-site construction monitor whose responsibility would be to monitor compliance with the terms and conditions of any Conservation District Use Permit (CDUP) as related to construction activities, as well as any terms and conditions agreed to between the constructing entity and CMS. The construction monitor would have the authority to order that any or all construction activity under a CDUP cease if there has been a violation of the terms or conditions of the CDUP or that the construction activity would unduly harm historic, natural, or cultural resources or burials.
- **Archaeological Monitoring.** An archaeological monitor is required during all ground-disturbing activities to monitor any impacts, real or potential, of construction activity on archaeological or historic resources. The monitor shall be a trained archaeologist selected by the CMS and approved by DLNR.
- **Inadvertent Discovery of Human Burials.** If an inadvertent discovery of any human burial is discovered in the course of construction, operation, or maintenance activities, the person making the discovery shall seek the advice and recommendation of either the Hawai'i Island Burial Council or Kahu Kū Mauna, recognized lineal or cultural descendent, for treatment of the inadvertently discovered burial consistent with HRS Chapter 6E and the State Historic Preservation Division's (SHPD) implementing rules.
- **Materials Storage.** All materials for construction of the Proposed Action would be stored either within the project site or in an approved construction staging area.

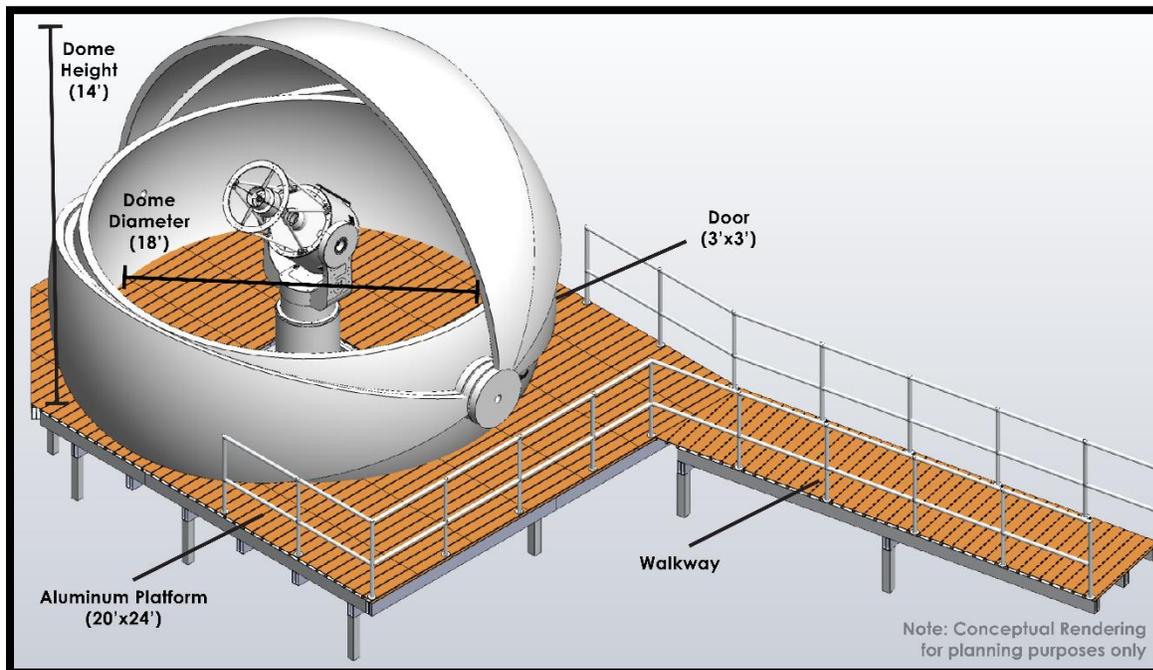
This page intentionally blank.

2.0 Proposed Action and Alternatives

2.1 Proposed Action

The Proposed Action includes the construction and operation of a new educational telescope. The telescope to be installed is a state-of-the-art PlaneWave Instruments CDK700 observatory system, with an aperture of 0.7 meter (28 inches) and a focal ratio of F/6.5. The instrumentation suite includes cameras and spectrographs for diverse observation projects, from solar system objects to stars, nebulae, and galaxies. The PlaneWave telescope and its instrumentation would be hosted within a prefabricated AstroHaven 18-foot dome as shown in **Figure 2**. The dome is of a clamshell design so there is no rotation. The sleeves can be fully open to give access to the entire sky or partly open to protect against winds. UH Hilo has owned all the equipment since 2016 but is unable to use it without a new site to install the equipment.

Figure 2. Conceptual Rendering of Clamshell Dome



Construction of the Proposed Action would include site work consisting of excavations and backfills approximately one- to two-feet-thick to achieve the design finished grades in an area of approximately 1,050 square feet. Backfill materials required for the Proposed Action would consist of select granular fills that are non-expansive. The excavated on-site materials may be reused as a source of select granular fill materials if particles greater than three inches in maximum dimension are removed. Due to the relatively low moisture content of the ground surface, moisture-conditioning of the on-site materials may be required to achieve proper compaction during construction. Compaction would be accomplished by sheepsfoot rollers, vibratory rollers, or other types of acceptable compaction equipment. Construction plans for the Proposed Action are provided in **Appendix A**.

The telescope would be mounted on a 3-foot-wide pier that rests on a 4.5-foot-wide square concrete footing with the bottom embedded approximately 1.5 feet below finished grade. The aluminum deck would be supported on fourteen (14) 12" square concrete pedestals that rest on 3.5-foot-wide square concrete footings with the bottom embedded approximately 1 foot below finished grade. The aluminum platform connecting the new deck to the existing building would be supported by two (2) additional 12" square concrete pedestals that rest on 2-foot-wide square concrete footings with the bottom embedded approximately 1 foot below finished grade. In addition to the deck and dome installation, the Proposed Action includes the installation of two swing gates and 11 bollards. Swing gates would consist of two (2) gate posts encased in concrete with a diameter of 1.5-feet which are embedded 4.75-feet below grade. There will also be a gate stop for each installation that consists of a 12" diameter concrete footing embedded 3' below grade. Adjacent to the south side of the new deck a 51" x 29", 6" thick concrete maintenance pad will be constructed for the Air-Cooled Condensing Unit. There will also be two (2) 12" diameter concrete footings embedded approximately 2-feet below grade to support the electrical panel.

The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom. However, it is envisioned that the telescope may be operated in two ways: (1) it would be operated remotely from the UH Hilo campus for the first part of the night, and (2) for the rest of the night it would be operated robotically. Local computers and electronics used for setup, storage, and maintenance for the telescope would be hosted within the dome. The main building at the Halepōhaku Mid-Level Support Facility could be used as an on-location room for teaching groups of students on an as-needed basis.

2.2 No-Action Alternative

Under the No-Action Alternative, the new educational telescope would not be constructed. There would not be a new telescope to support the educational and research goals of UH Hilo's Department of Physics and Astronomy.

2.3 Alternatives Considered But Not Carried Forward For Further Analysis

Between 2016 and 2018, UH Hilo evaluated 15 site alternatives in addition to the proposed site at Halepōhaku before selecting Halepōhaku as the best location for the new educational telescope facility. The 15 sites evaluated and the reasons for their dismissal are provided in **Table 2**.

Table 2. Evaluated Sites for the New Educational Telescope

Site	Evaluation	
	Pros	Cons
Big Island of Hawai'i		
Maunakea Hōku Ke'a Summit Site	<ul style="list-style-type: none"> • Best sky conditions • Existing UH Hilo facility 	<ul style="list-style-type: none"> • Site to be decommissioned
Maunakea Very Long Baseline Array	<ul style="list-style-type: none"> • Excellent site 	<ul style="list-style-type: none"> • Obstructed sky • Maunakea limited number of telescopes on summit (not available) • Sensitive cultural location
Pu'u Wa'a Wa'a (H. Rogers Ranch)	<ul style="list-style-type: none"> • Convenient location • Local facilities available • Acceptable sky conditions 	<ul style="list-style-type: none"> • Major weather concern • Very high humidity at night
Kawaihae Kohala Estates	<ul style="list-style-type: none"> • Private astronomical site • Potential "observatory farm" 	<ul style="list-style-type: none"> • Some light pollution • Windy • Fire hazard concerns • Site never developed by owner
Hawi	<ul style="list-style-type: none"> • Private astronomical site 	<ul style="list-style-type: none"> • Too windy and rainy • Lost connection with Maunakea community
Ocean View	<ul style="list-style-type: none"> • Private astronomical site 	<ul style="list-style-type: none"> • High humidity • Acidic environment • Safety and vandalism concerns • Landowner deceased
UH Hilo Campus	<ul style="list-style-type: none"> • Convenient 	<ul style="list-style-type: none"> • Bad weather • Light pollution • Not aligned with the project mission
Gilbert Kahele Recreation Park	<ul style="list-style-type: none"> • Convenient location 	<ul style="list-style-type: none"> • Light pollution from traffic • Safety concerns • Some obstructed views • Complex permitting process (e.g., possible Section 4f issue)
Kilohana Girl Scout Camp	<ul style="list-style-type: none"> • Acceptable sky conditions 	<ul style="list-style-type: none"> • Frequent fog • Light pollution due to traffic • Safety concerns • Fire hazard
Hawai'i Community College - Palamanui Campus	<ul style="list-style-type: none"> • Convenient location • UH facility 	<ul style="list-style-type: none"> • Very severe light pollution • Severe fog

Site	Evaluation	
	Pros	Cons
Maunaloa Observatory	<ul style="list-style-type: none"> • Good astronomical site • Convenient location 	<ul style="list-style-type: none"> • Site is not available or permittable • Some obstructed sky
Semi-Mobile Observatory (trailer)	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Not easily feasible because of size of dome • Costly
Off-Island		
Lowell Observatory Anderson Mesa (Northern Arizona)	<ul style="list-style-type: none"> • Professional site 	<ul style="list-style-type: none"> • Lost connection with Maunakea community • Only available for observation 50% of the time • Inconvenient for hands-on learning
Haleakala (Island of Maui)	<ul style="list-style-type: none"> • Professional site 	<ul style="list-style-type: none"> • Convenient only if local support • Costly maintenance
University of Oregon Observatory (Central Oregon)	<ul style="list-style-type: none"> • Suitable educational site • Student and institutional collaboration opportunities 	<ul style="list-style-type: none"> • Lost connection with Maunakea community • Inconvenient for hands-on learning
PlaneWave Remote Observatory (Sierra Nevada Mountains)	<ul style="list-style-type: none"> • Good professional astronomy site 	<ul style="list-style-type: none"> • Minimum local support • Lost connection with Maunakea community • Inconvenient for hands-on learning

3.0 Affected Environment, Potential Impacts, and Avoidance and Minimization Measures

3.1 Cultural Practices and Beliefs

3.1.1 Affected Environment

Hawai'i's Act 50 (2000) sought to “promote and protect cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups” and requires the project proposers under HRS Chapter 343 to consider cultural practices in a cultural impact assessment.

Pacific Consulting Services, Inc. (PCSI) prepared a Cultural Impact Assessment (CIA) for the Proposed Action in December 2020. The report, *Cultural Impact Assessment in Support of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea, Hawai'i Island*, is included with the EA in **Appendix B**. The objective of the CIA is to gather information concerning historic properties, cultural resources, and traditional cultural practices that may be impacted by the Proposed Action. The CIA was prepared pursuant to Act 50 (House Bill No. 2895, signed into law on April 26, 2000). The CIA was also prepared in accordance with HRS Chapter 343. In addition, the CIA draws upon HRS Chapter 6E-8 as well as Title 13 of HAR Subtitle 13, State Historic Preservation Division Rules and HAR Chapter 275, Rules Governing Procedures for Historic Preservation Review for Governmental Projects for pertinent definitions and methodologies concerning historic properties and cultural resources.

Understanding the cultural setting of an area includes compiling and analyzing archival, historical, and traditional information from many sources. In addition to written or published sources, identifying and inviting individuals and groups to share their knowledge relating to traditional practices and beliefs is important to developing a well-rounded, informed understanding of the cultural setting of an area.

To complete the CIA, a historical and archaeological literature review was conducted for the Proposed Action. The background research was completed using various documentary and archival resources, including the State Historic Preservation Division's (SHPD) database of archaeological reports, the SHPD report library, a Land Commission Awards (LCA) review via the Bureau of Conveyances, a review of historic maps, and a review of Mauna Kea reports on file at PCSI. Consultation letters were sent to a broad spectrum of the community that included organizations, government agencies, and individuals for input. In addition, an invitation to participate was published in the Office of Hawaiian Affairs' (OHA) *Ka Wai Ola* newsletter in December 2021.

Literature Review

Historical Background

Place names in the summit region are a mix of traditional and modern nomenclature. Mauna Kea has been interpreted literally as White (Kea) Mountain (Mauna), but also as a reference to the union between the gods Wākea and Papa that formed the mountain. Some contemporary Native Hawaiian cultural practitioners continue to view Mauna Kea as a first-born child of Papa and Wākea, and thus the mountain

is revered as “the hiapo, the respected older sibling of all Native Hawaiians.” The currently used name for the summit is Kūkahau'ula which refers to the legendary husband of Līlīnoe and an 'aumakua (family deity) of fishermen.

Traditional genealogical mele and mo'olelo (stories, traditions) recount associations between Mauna Kea and Poli'ahu, Līlīnoe, Waiau, and Kahoupakane. In a mo'olelo recounting the travels of Pūpū-kani-'oe, it was said that Mauna Kea was a mountain “on which dwell the women who wear the kapa hau (snow garments).” Another mo'olelo, which dates to the 1300s, explains that Ka-Mike was sent atop Mauna Kea's summit to the royal compound of Poli'ahu, Līlīnoe, and their ward, Ka-piko-o-Waiiau, to fetch water for use in an 'ai-lolo ceremony (Maly and Maly, 2005).

In 1931, Emma Ahu'ena Taylor, a historian of Hawaiian descent with genealogical ties to the lands of Waimea and Mauna Kea, reported on Poli'ahu's residence at Mauna Kea, but also described the creation of Lake Wai'au. According to Taylor, on Mauna Kea, Poli'ahu's attendants Līlīnoe, Lihau, and Kipu'upu'u drove away her suitor, Kūkahau'ula (the pink-tinted snow god). But Mo'o-i-nanea allowed the snow god to embrace Poli'ahu, and to this day, Taylor reports, “Ku-kahau-ula, the pink snow god, and Poli'ahu of the snow white bosom, may be seen embracing on Mauna-kea” (Maly and Maly, 2005).

Of the several place names in the vicinity of Halepohaku, Pu'u Kalepeamoia is the only one to appear on early government survey maps and the literature on late nineteenth century expeditions to the summit. The Mauna Kea-Humu'ula trail, first plotted by Alexander in 1892, passes near or through the Halepohaku area.

Land Use

During pre-Contact times, the slopes of Mauna Kea, above the limits of agriculture and permanent settlement, were a vast montane “wilderness” probably known to only a small number of Hawaiians engaged in primarily “special purpose” activities such as bird-catching, canoe making, stone-tool manufacture, or burial of the dead (McEldowney 1982); ethnographic information relating to specific activity localities is generally lacking although archaeological evidence provides some evidence of past land use in the form of adze production (primarily at the Mauna Kea Adze Quarry but elsewhere as well), human burial, and the erection of shrines.

Changes to traditional Hawaiian lifeways began soon after the arrival of Captain James Cook in 1778. One significant change was the rapid adoption of Western tools, clothing and other items, initially by the chiefs and subsequently by commoners. The impact on traditional technologies is known in a general way from historic accounts, such as diaries and newspapers, but for remote centers of traditional crafts, such as the Mauna Kea Adze Quarry, there is little or no information on how long they continued to be utilized before abandonment.

The first recorded ascent of Mauna Kea by a European was made by the Rev. Joseph Goodrich on August 26, 1823 (Goodrich 1833:200). A number of visits followed shortly thereafter, including ones by such prominent figures as the renowned botanist David Douglas. Ascents of Mauna Kea by Europeans and

Hawaiians occurred throughout the nineteenth century, including Queen Emma's famous visit to Lake Waiau in 1881 or 1882 (de Silva and de Silva, 2007).

The early 20th century marked the beginning of a new era in the land use history of Maunakea. Large numbers of wild sheep were devastating the forests below the summit in the early part of the century. The extent of the devastation was the impetus for a monumental fencing program undertaken by the Civilian Conservation Corps (CCC) in the 1930s. The CCC was also engaged in improving roads and building facilities for visitors. In 1936 the CCC made improvements to what is believed to have been a section of the old Mauna Kea-Humu'ula Trail, from near the Humu'ula Sheep Station at Kalaieha to the summit. The first stone cabin at what became known as Halepōhaku (House of Stone) was also built during this time. Prior to the construction of a road above Ho'okomo, the cabin at Halepōhaku provided a convenient overnight rest spot for hikers and ski enthusiasts (McCoy, 1984).

Traditional Cultural Properties

SHPD has designated several prominent localities on Maunakea as Traditional Cultural Properties (TCP) due to their cultural significance to the Hawaiian people. All the TCP are located in the summit area of Maunakea.

Cultural Practices and Resources

A Cultural Resources Management Plan for the University of Hawai'i Management Areas on Mauna Kea, Ka'ohē Ahupua'a, Hāmākua District, Hawai'i Island, State of Hawai'i (CRMP) (PCSI, 2009), a sub-plan of the CMP, was approved by the BLNR on March 25, 2010. It was developed to create a greater understanding of Maunakea's rich cultural heritage including the preservation and management of its cultural resources. The CRMP describes traditional and customary, as well as contemporary cultural practices associated with Maunakea.

- **Traditional Practices and Beliefs.** Those that have been passed on through generations either orally or through practice.
- **Contemporary Practices and Beliefs.** Current practices and beliefs for which no clear specific basis in traditional culture can be established or demonstrated and may be based on either earlier traditional practices of non-Hawaiian traditions but have evolved and changed.

Most cultural practices on Maunakea occur at higher elevations. However, there are a few known cultural practices and resources associated with Halepōhaku and the surrounding area. These include the following:

- Contemporary ahu within the DLNR-managed silversword enclosure that is utilized by cultural practitioners.
- Two shrines (SIHP #5010-23-10313 and SIHP #50-10-23-10315) identified as part of the Pu'ukalepeamoā Complex are located just south of the Halepōhaku parcel within the Mauna Kea Forest Reserve near the dirt jeep road.
- Cultural practitioners may collect ko'oko'olau and māmane for medicinal or cultural purposes; however, these collections are not known to occur within the area immediately surrounding the Halepōhaku Mid-Level Support Facility.

Most cultural activities within the UH Management Areas take place during daylight hours with a few occurring at night or in the early morning hours.

The CMP requires that access be maintained to culturally significant sites on Maunakea. The CMP states that “Native Hawaiian traditional and customary practices shall not be restricted, except where safety, resource management, cultural appropriateness, and legal compliance considerations may require reasonable restrictions.” In other words, continued cultural practices at Maunakea must be provided for as long as they do not result in the alteration or destruction of historic properties or physical impacts such as those that may result from leaving behind offerings of food or other debris. The CMP dictates that public access to Halepōhaku is unrestricted except at the private sleeping and eating areas.

Cultural Consultation

In an effort to more fully understand the cultural and historical background and setting within and around the project area and bring as much information to the decision-making process for this project as possible, PCSI sought community input. The consultation process to identify historic and cultural resources attempts to bridge a gap between historic properties and traditional and customary practices.

While the historic preservation component has been well developed in terms of regulatory efforts, the traditional and customary practices aspects, with regards to CIAs, has been slower to develop. One analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Native Hawaiian communities has been developed as a result of a court case identified as *Ka Pa‘akai O Ka ‘Āina vs. Land Use Commission* (Ka Pa‘akai). From that court decision, the following three-part process was developed to evaluate potential impacts and is commonly applied to implement and satisfy HRS Chapter 343 and the Guidelines for Assessing Cultural Impacts:

1. Identify whether any valued cultural, historical, or natural resources are present and identify the extent to which any traditional and customary Native Hawaiian rights are exercised.
2. Identify the extent to which those resources and rights will be affected or impaired.
3. Specify any measures to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

Consultation Efforts

Initially, consultation invitation letters were sent to 68 entities (community members, community groups, and State agencies) on October 30, 2020 and June 29, 2021 either by email or post asking for input concerning historic sites located in or near the project area, as well as cultural traditions, legends, and traditional cultural places and practices pertaining to the area. The letter included background information as well as a project location map. The 68 entities were identified as interested parties by OMKM, primarily through interactions as part of previous undertakings within UH managed lands on Mauna Kea. An additional eight potentially interested entities (three of which were alternate chapters or individuals of previously contacted community groups) were identified and sent consultation invitation letters on October 1, 2021.

In addition to the direct mailings, PCSI met with Kahu Kū Mauna (KKM) to discuss the project. KKM is a volunteer community-based council from the native Hawaiian community that advises the MKMB, CMS,

and the UH Hilo Chancellor on Hawaiian cultural matters affecting the UH Management Areas of Mauna Kea.

Finally, an invitation to participate was published in OHA's *Ka Wai Ola* newsletter in December 2021.

Responses

Nine responses were returned from the email/postal solicitation. None of the responses provided specific information concerning historic properties, cultural resources, or traditional practices within the project area. Nonetheless, several responses provided feedback and recommendations to strengthen the CIA; several consultants also noted an opposition to further development on Mauna Kea. Comments received and responses are provided in **Table 3**.

Table 3. Comments Received and Responses

Commenter	Comment	Response
Office of Hawaiian Affairs	Requested regulatory clarification concerning why an archaeological inventory survey (AIS) and an archaeological literature review (ALR) was being conducted for the project.	As discussed in Section 3.2.1 , an AIS (with no subsurface testing) was conducted for the APE. However, because the AIS resulted in negative findings (no historic properties), the document will be prepared as an ALR with field inspection following the guidance of SHPD.
Office of Hawaiian Affairs	Recommended providing invited consultants a more integrated discussion that provides information concerning how the invited information could be used and how the invited information might be integrated with other proposed projects, specifically the Hōkū Ke'a Decommissioning Project, which would remove an observatory previously used as the UH Hilo Educational telescope from the summit region. The Halepohaku project would provide a new location for the UH Hilo Educational telescope.	Subsequent invitations to potential consultants clarified the regulatory aspects as well as the nature of the consultation request. Most of the invited parties were also invited to consult on the Hōkū Ke'a Decommissioning Project, which also provided regulatory and cross-project clarification.
State Historic Preservation Division	No substantive comments but provided several historic preservation-related reports pertinent to the Mauna Kea summit region.	The additional reports were integrated into the CIA.
UH Hilo Hanakahi Council	Requested a presentation.	An email providing links to the overall project, including

Commenter	Comment	Response
		background information and project details was provided.
Mr. Leningrad Elarianoff	Provided information concerning Hawaiian origins passed down to him from his mother who “. . .was a story teller who spent many hours with the old folks in Kau trading stories that were passed down for generations.”	N/A
Mr. Kaliko Akulele	Did not provide specific information concerning historic properties or traditional or customary places or practices within or near the project area but did voice an opposition to any further development on Mauna Kea (especially at the summit).	N/A
The Royal Order of Kamehameha	Did not provide specific information concerning historic properties or traditional or customary places or practices within or near the project area but did voice opposition to development of any kind on Mauna Kea.	N/A
President of the Hawaii Island Native Hawaiian Chamber of Commerce	Stated that she would share the provided information with her board and reply. No additional information was received.	N/A
Department of Business, Economic Development & Tourism	Stated that they had no information to provide concerning the subject matter.	N/A
Mr. Lehua Vincent	Chose not to participate but commented that he did not support another telescope on Mauna Kea.	N/A

Ka Pa'akai Analysis

The consultation process did not identify any previously unknown historic properties, traditional properties, or traditional/customary cultural practices within the proposed project area. As such, based on the consultation process, there is no indication that any Native Hawaiian resources or rights will be affected or impaired as a result of the proposed project. While the first two components of a Ka Pa'akai analysis can, and typically do focus directly on a specific project design or area, the third component of mitigation is an opportunity to speak to and support broader themes of cultural responsibility that can be fruitfully addressed as recommendations.

3.1.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to cultural practices and beliefs if it would have a substantial adverse effect on the cultural practices of the community or state. Significant impacts would occur if the Proposed Action were to cause the following:

- Substantially alter or remove a location where cultural practices take place
- Unduly restrict or prevent a cultural practice from taking place
- Introduce new elements that substantially alter the setting in which cultural practices take place. This can include visual elements, noise, traffic, and human presence.

Construction

Construction of the Proposed Action would not impede cultural practices. Construction would occur adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility which is in an area not typically accessed by the public. There would be no impacts to the DLNR-managed silversword enclosure or the two shrines identified as part of the Pu'ukalepeamoā Complex. Cultural practitioners will still be able to access and collect from areas with Ko'oko'olau and māmane for medicinal or cultural purposes as those activities are not known to occur within the area immediately surrounding the Halepōhaku Mid-Level Support Facility. Construction activities would result in an increase in noise levels (see **Section 3.9.2**) that could impact cultural practitioners and practices in the vicinity of the Proposed Action. The increase in noise levels would be short-term and temporary and would not prevent cultural practices from occurring.

Under the No-Action Alternative, the new educational telescope would not be constructed, and the site would continue being used for equipment storage. There would be no impacts to cultural practices and beliefs.

Operation

Operation of the Proposed Action would not adversely affect gathering of cultural resources or impede access to areas utilized for subsistence hunting and gathering. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom; therefore, there would not be a significant increase of noise, traffic, or human presence. The Proposed Action would introduce a new visual element into the landscape: the 18-foot dome. The dome structure would be adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility and would not be taller than the existing buildings.

Therefore, the Proposed Action would not substantially alter the setting in which cultural practices take place.

Under the No-Action Alternative, the new educational telescope would not be constructed, and the site would continue being used for equipment storage. There would be no impacts to cultural practices and beliefs.

3.1.3 Avoidance and Minimization Measures

The following measures would be implemented, as required by the CMP and the CRMP to minimize potential impacts to cultural practices and beliefs:

- All persons involved with construction activities shall attend a mandatory training about the cultural and historical resources on Maunakea.
- A cultural monitor would be engaged throughout construction. A cultural monitoring plan would be developed in consultation with KKM to provide guidance and constancy throughout construction and operation of the Proposed Action.

3.2 Archaeological and Historic Resources

3.2.1 Affected Environment

PCSI conducted an archaeological literature review and field inspection (ALRFI) for the Proposed Action in October 2019. The report, *Archaeological Literature Review with Field Inspection in Support of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Maunakea, Hawai'i Island, Hawai'i*, is included with this EA in **Appendix C**. The objective of the ALRFI was to gather information concerning historic properties and cultural resources that may be impacted by the Proposed Action.

The literature review identified 10 archaeological investigations that have been conducted at or near Halepōhaku. No historic properties have been recorded within the site for the Proposed Action. However, four significant historic properties are located within approximately 100 meters (328 feet) of the Proposed Action:

- **SIHP 50-10-23-10314.** One of several sites comprising the Pu'u Kalepeamoia Site Complex characterized as a pre-Contact traditional lithic scatter that includes adze and octopus lure sinker manufacturing by-products and other artifacts possibly used in other activities, such as woodworking. The site covers approximately 2,000 square meters (0.5 acre). In 1985 the site was noted to have been recently disturbed and surface artifacts were collected. Since 2012 the site has been visited annually to assess changes. While some natural erosion has exposed additional lithic material, the site has remained undisturbed.
- **SIHP 50-10-23-09074, 09075, and 09076.** Historic Halepōhaku Rest House 1, Historic Halepōhaku Rest House 2, and Historic Halepōhaku Comfort Station, respectively. The Halepōhaku Rest Camp and Comfort Station comprises three buildings immediately south of the Halepōhaku Mid-Level Support Facility. The Rest House buildings were constructed by the Civilian Conservation Corps between 1936 and 1939, and the Comfort Station was constructed in 1950 by the Territory of Hawai'i's Division of Forestry. The three buildings have been individually recommended as eligible

for the National Register of Historic Places (NRHP) and Hawai'i's State Register of Historic Places under Criterion A and Criterion C. These historic properties are associated with events that have made a significant contribution to the broad patterns of history (Criterion A) and they embody the distinctive characteristics of a type, period, or method of construction (Criterion C).

The field investigation covered the APE of approximately 5,420 square feet (0.12 acre). The ground surface has been heavily modified by a dirt access road, the installation of a septic system, and the use of the area for equipment storage. No historic properties or surface archaeological deposits were recorded during the survey. A māmane tree is present to the east of the APE.

3.2.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to archaeological and historic resources if it would irrevocably commit a natural, cultural, or historic resource. Significant impacts would occur if any of the identified historic properties discussed in **Section 3.2.1** were physically altered or disturbed by the Proposed Action or if the Proposed Action substantially compromises the integrity of an historic property.

Construction

Construction of the Proposed Action would not result in any adverse impacts to any above-ground archaeological resources, including SIHP 50-10-23-10314, SIHP 50-10-23-09074, SIHP 50-10-23-09075, and SIHP 50-10-23-09076. Based on multiple archaeological studies that have included both surface and subsurface scrutiny, there is a possibility of subsurface deposits in the area based on the recording of several non-contiguous archaeological sites near the site of the Proposed Action. However, due to previous disturbance of the area, it is unlikely that subsurface archaeological deposits or human burials are present within the APE for the Proposed Action.

Under the No-Action Alternative, the new educational telescope would not be constructed, and the site would continue being used for equipment storage. There would be no impacts to archaeological and historic resources.

Operation

Operation of the Proposed Action would have no impacts to archaeological or historic resources.

Under the No-Action Alternative, the new educational telescope would not be constructed, and the site would continue being used for equipment storage. There would be no impacts to archaeological and historic resources.

3.2.3 Avoidance and Minimization Measures

The following measures would be implemented, as required by the CMP and the CRMP, to minimize potential impacts to archaeological and historic resources:

- All persons involved with construction activities shall attend a mandatory training about the cultural and historical resources on Maunakea.

- An independent qualified archaeologist would be retained by the contractor to monitor all ground disturbing activities for historic features such as artifact concentrations of shell or charcoal.
 - The archaeological monitor would have the authority to order that any or all construction activity cease in the event any historic properties or human remains are encountered.
 - Per HRS Chapter 6E, if the contractor encounters possible or suspected historical features, all work would immediately be suspended and CMS would be notified, who in turn would notify SHPD.
 - In addition, Kahu Kū Mauna Council would be consulted.
 - If the feature is deemed significant, an appropriate mitigation plan (which may include recovery) would be developed jointly by SHPD and UH Hilo.
- A Rock Movement Plan, developed by the contractor and approved by CMS, would be included in the construction BMPs.
- The procedures detailed in the SHPD-approved Long-term Historic Property Monitoring Plan for the University of Hawai'i Management Areas on Mauna Kea would be followed (Gosser et al., 2014).
- In the unlikely event that any human remains or any burial goods over 50 years old are uncovered at any time after construction commences, the procedures set out in HRS Section 6E-43.6 and HAR Section 13-300-40 would be followed.
 - This includes immediately suspending all work in the area and notifying CMS, who in turn would notify SHPD.
 - Work shall not commence until a treatment and disposition plan has been developed by SHPD in consultation with the Hawai'i Island Burial Council, Office of Hawaiian Affairs, CMS, and any recognized descendants.

3.3 Biological Resources

3.3.1 Affected Environment

Vegetation Communities and Habitat

Halepōhaku is located in the māmane (*Sophora chrysophylla*) woodland vegetation community that occurs on Maunakea from 9,100 feet msl to between 9,800 and 10,200 feet msl. The scrubland vegetation community is characterized by pūkiawe (*Leptechophylla tameiameia*), nohoanu (*Geranium cuneatum*), 'ōhelo (*Vaccinium reticulatum*), and na'ena'e (*Dubautia ciliolata*). The subalpine woodlands vegetation community is dominated by māmane, and 'āweoweo (*Chenopodium oahuense*). Less abundant are nohoanu and two native mints (*Stenogyne microphylla* and *S. rugosa*). The most abundant native grasses are pili uka (*Trisetum glomeratum*) and Hawai'i bentgrass (*Agrostis sandwicensis*).

The area has a long history of feral mammal browsing that has resulted in a decrease in populations of native plant species and establishment of invasive weed species; however, there are mature māmane trees that provide refuge and food for some species. There has been a heavy culling of feral mammals in the area, and māmane trees and other habitat elements are recovering.

Flora

There are very few native plant species, mainly grasses, within the project site. There is one māmane tree adjacent to the site, which is a critical food source to Federal and State-listed birds that may occur in the vicinity of the Proposed Action.

The Federal and State endangered **Mauna Kea silversword** (*Argyroxiphium sandwicense* ssp. *sandwicense*) occurs in high-elevation habitats at altitudes ranging from about 8,500 to 12,500 feet above msl. Its general habitat is well-drained alpine scrub or cinder desert, with a substrate derived from volcanic rock and debris, and receiving 20 to 69 inches of precipitation per year. There are no wild individuals of Mauna Kea silversword near the Halepōhaku Mid-Level Support Facility; however, there is an enclosure behind the Visitor Information Station where the Mauna Kea silversword has been outplanted.

Federal and State threatened **Hawaiian catchfly** (*Silene hawaiiensis*) is a sprawling shrub found in open, dry areas up to approximately 9,880 feet above msl. Hawaiian catchfly has been detected during surveys within the Halepōhaku Mid-Level Support Facility boundaries.

Invasive plant species are more prevalent both in abundance and number of species near the Halepōhaku Mid-Level Support Facility than they are at higher elevations. Long-term efforts to control invasive weed species from being transported to and around Maunakea include a monthly volunteer weed pull at Halepōhaku. These weed pulls began in 2012 and focus on reducing the number of non-native broadleaf species from around the parking areas and buildings. Grasses are left in place to hold the soil and to avoid impacts to native species that have grown amongst the invasive grasses.

Fauna

Māmane woodlands on Maunakea are home to a wide variety of native invertebrates (i.e., insects, spiders), the native Hawaiian hoary bat (*Lasiurus cinereus semotus*), and a few species of native birds. Fauna species are further discussed in the following subsections.

Mammals

As shown in **Table 4**, there are 10 mammal species that are known to occur or could potentially occur at Halepōhaku.

The endangered 'ope'ape'a, or **Hawaiian hoary bat**, was once found on all the main Hawaiian Islands but is now thought to be limited to Hawai'i, Kaua'i, and Maui. They have been observed up to 13,500 feet above msl on Maunaloa and use a variety of both native and non-native vegetation types. The Hawaiian hoary bat typically roosts alone in foliage and are known to migrate. Their densities in high elevation areas are thought to be highest during winter months (December through March). They have been observed in the māmane woodlands on Maunakea, but the status of the species at Halepōhaku is unknown.

Table 4. Mammals Known to Occur or Potentially Occur within the Project area

Common Name	Scientific Name	Origin/Status	Occurrence
Feral goat	<i>Copra hircus</i>	Non-Native	Known
Feral cat	<i>Felus catus</i>	Non-native	Known intermittent
Mongoose	<i>Herpestes auropuntatus</i>	Non-Native	Known intermittent
'ope'ape'a, Hawaiian hoary bat	<i>Lasiurus cinereus semotus</i>	Endemic/ Endangered	Observed in the māmane subalpine woodland vegetation community on Maunakea, but the status of the species at Halepōhaku is unknown.
House mouse	<i>Mus domesticus</i>	Non-Native	Known
Mouse	<i>Mus musculus</i>	Non-Native	Known
Feral sheep	<i>Ovis aries</i>	Non-Native	Known
Mouflon sheep	<i>Ovis musimon</i>	Non-Native	Known
Black rat	<i>Rattus rattus</i>	Non-Native	Known
Pig	<i>Sus scrofa</i>	Non-Native	Known intermittent

Birds

As shown in **Table 5**, there are 16 bird species that are known to occur or could potentially occur at Halepōhaku. Of these, only four have been observed at Halepōhaku in recent times. Two native bird species, the Hawaiian owl (*Asio flammeus sandwichensis*) and Hawaiian hawk (*Buteo solitaries*), are unlikely to breed in the area due to the high elevation but they could utilize habitat at Halepōhaku for foraging.

The most observed special-status bird species at Halepōhaku is the 'amakihi, an endangered species that is known to forage on a variety of food sources. Other common special-status birds observed at Halepōhaku include 'apapane, and 'i'iwi, which are species of concern.

The **'amakihi** is a Federal Species of Concern with a range between 2,100 feet and 9,840 feet above msl. They have a strong association with dry and mesic forests, including māmane and māmane-naio woodlands. In subalpine woodlands, 'amakihi nest primarily in māmane trees and choose trees that are taller than average. 'Amakihi are highly dependent on nectar availability, especially during the breeding season (November through July), and will not breed in areas that do not have sufficient densities of māmane flowers.

The **'apapane** is a Federal Species of Concern that breeds in mesic and wet 'ōhi'a forests. They make seasonal and daily movements from wet forest to subalpine woodland and leeward dry woodlands when nectar is available, mainly in September through November. They feed on māmane nectar in the subalpine woodland. Breeding begins in October and November and peaks February through June.

Table 5. Bird Species Known to Occur or Potentially Occur within the Project area

Common Name	Scientific Name	Origin/Status	Occurrence
Pueo, Hawaiian owl	<i>Asio flammeus sandwichensis</i>	Endemic	Potentially
Nēnē, Hawaiian goose	<i>Branta sandvicensis</i>	Endemic/ Endangered	May inhabit high elevation grasslands and dry forests during the breeding season but evidence suggests that this species no longer utilizes the area around Halepōhaku.
‘Io, Hawaiian hawk	<i>Buteo solitaires</i>	Endemic/ Endangered	Not frequent visitors to the māmane subalpine woodland vegetation community but could pass through occasionally.
Hawai‘i ‘elepaio	<i>Chasiempis sandwichensis</i>	Endemic	Potentially
‘Amakihi	<i>Chlorodrepanis virens virens</i>	Endemic/ Species of Concern	Observed at Halepōhaku during the 1979 and 1985 bird surveys.
‘Apapane	<i>Himatione sanguinea</i>	Endemic/ Species of Concern	Observed at Halepōhaku during the 1979 and 1985 bird surveys.
Palila	<i>Loxioides bailleui</i>	Endemic/ Endangered	Halepōhaku is within the boundaries of palila critical habitat, although palila have not been observed at Halepōhaku for many years.
‘Ua‘u, Hawaiian petrel	<i>Pterodroma sandwichensis</i>	Endemic	Unlikely
‘I‘iwi	<i>Vestiaria coccinea</i>	Endemic/ Species of Concern	Observed within the māmane subalpine woodland vegetation community, but not observed at Halepōhaku during the 1979 and 1985 bird surveys.
Chukar	<i>Alectoris chukar</i>	Non-Native	Known
California quail	<i>Callipepla californica</i>	Non-Native	Known
Erckel’s Francolin	<i>Francolinus erckelii</i>	Non-Native	Known
White eye	<i>Zosterops japonica</i>	Non-Native	Known
Red-billed Leiothrix	<i>Leiothrix lutea</i>	Non-Native	Known
House finch	<i>Carpodacus mexicanus</i>	Non-Native	Known
House sparrow	<i>Passer domesticus</i>	Non-Native	Known

The **'iwi** is a Federal Species of Concern that feeds on nectar from māmane and naio (*Myoporum sandwicense*) flowers and may traverse the upper slopes of Maunakea. 'iwi abundance in subalpine forests is tied to nectar availability and māmane flower abundance. Most 'iwi move between māmane woodlands and their primary breeding habitat, the mesic to wet koa and 'ōhi'a forests. Their breeding season coincides with peak 'ōhi'a flowering with most breeding occurring between February and June.

The **palila** is a Federal and State-listed endangered species. The palila is an extreme food specialist that prefers unhardened māmane seeds in green pods or in pods that are just beginning to turn brown. They also eat māmane flowers, buds, and leaves and naio (*Myoporum sandwicense*) berries, especially when other foods are in short supply. Caterpillars and other insects are important in the diet of nestlings and are also eaten frequently by adults. Palila move in response to the availability of māmane seeds, although home range sizes and movement distances are relatively small only encompassing less than a third of the way around Maunakea during their entire lives. Palila usually start nesting in March to early May with egg-laying continuing through August or mid-September. Preferred nest sites are in forks near the ends of higher branches in medium to large māmane trees, in other tree and shrub species, and even in a clump of grass on the ground (USFWS, 2006). Critical habitat within the Mauna Kea Forest Reserve was designated September 22, 1977 (Federal Register Vol. 42, No. 184; September 22, 1977). All of the Halepōhaku parcel lies within Federally designated palila critical habitat, although palila have not been observed at Halepōhaku for many years.

The endangered 'io, or **Hawaiian hawk**, occur from sea level to approximately 8,500 feet above msl on the Island of Hawai'i and are known to utilize a broad range of forest habitats. They have been observed in subalpine māmane-naio woodlands in the past and could utilize habitat at Halepōhaku for foraging. However, they are unlikely to breed in the area due to the high elevation.

The endangered Nēnē, or **Hawaiian goose**, historically inhabited grasslands, grassy shrublands, and dryland forest from sea level to the subalpine and alpine zones. They likely inhabited high-elevation sites such as the māmane-naio woodlands in the subalpine zone. Nēnē are currently found on the Island of Hawai'i in a number of areas from sea level to 7,900 feet above msl. Nēnē have not been observed in surveys since 1979, and no evidence suggests that they are currently using the area around Halepōhaku.

Invertebrates

The māmane forests on Maunakea have high arthropod diversity with more than 200 species that have been collected. Surveys aimed at describing invertebrate diversity at Halepōhaku have been ongoing since 2012. Recent surveys have recorded 99 species on or around three native host plants: 'āweoweo (*Chenopodium oahuense*), hinahina (*Geranium cuneatum*), and māmane (*Sophora chrysophylla*) (Stever, 2016). Approximately 30% of these are native species. One species is listed as threatened, and several have been listed as "species of concern."

The **black-veined *Agrotis* noctuid moth** (*Agrotis melanoneura*) is a Federal Species of Concern that is uncommon but widespread on Maunakea. The species has been observed at light traps at Halepōhaku. Little information is available regarding this species.

The **yellow-footed yellow-faced bee** (*Hylaeus flavipes*) is a Federal Species of Concern. The yellow-footed yellow-faced bee inhabits coastal and lowland and montane dry shrubland and forests and has been observed foraging on māmane trees at Halepōhaku. Threats to the species include habitat destruction and modification from land use change, non-native plants, ungulates, and fire, along with predation by ants and wasps.

The **difficult yellow-faced bee** (*Hylaeus difficilis*) is a Federal Species of Concern that has been observed and captured at Halepōhaku.

Two snail species, *Succinea knoaensis* and *Vitrina tenella*, are Federal Species of Concern that have been collected at Halepōhaku.

3.3.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to biological resources if it would irrevocably commit a natural resource or have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat. A significant impact would occur if the Proposed Action resulted in the following:

- Long-term loss or impairment of a substantial portion of local habitat of indigenous Hawaiian species
- Substantial reduction in the population of a protected species, as designated by Federal and State agencies, or a species with regional and local significance
- Introduction or increase of the prevalence of undesirable non-native species
- Curtail the range of native Hawaiian species
- Reduce the range of beneficial uses of the environment

Construction

Construction of the Proposed Action would result in minimal vegetation clearing. Vegetation disturbance would be restricted to the extent necessary to complete construction of the Proposed Action. The existing māmane tree is not located within the project footprint and would not be impacted by construction.

Construction of the Proposed Action may result in the introduction and spread of invasive species. These impacts would be minimized through measures detailed in **Section 3.3.3**.

Construction of the Proposed Action could have the potential for short-term and temporary impacts to local fauna due to noise and additional human presence. However, the project site is small and located within a developed area with continual human presence. Therefore, no significant adverse impacts are expected to local fauna.

Although forest birds, including the 'amakihi, 'apapane, and 'i'iwi are known to occur at Halepōhaku, impacts to the species are not expected. The project site is small and not in an area with an abundance shrubs and trees; therefore, it is not prime habitat for forest birds. It is expected that any forest birds present in the area during construction would forage in surrounding areas.

The Hawaiian hoary bat is not known to regularly occur within the project area, and no trees would be removed during construction of the Proposed Action. Therefore, impacts to the Hawaiian hoary bat are not expected. Any potential impacts to the Hawaiian hoary bat would be minimized through implementation of the measures in **Section 3.3.3**.

No impacts are expected to invertebrates from construction of the Proposed Action. Construction of the Proposed Action would be limited to the project footprint. Vegetation clearing would be limited, and measures would be implemented to minimize the spread of invasive species as discussed in **Section 3.3.3**.

Operation

Operation of the Proposed Action would have no impacts to biological resources. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom.

Under the No-Action Alternative, the new educational telescope would not be constructed; therefore, there would be no impacts to biological resources.

3.3.3 Avoidance and Minimization Measures

Invasive Species

The following measures detailed in the *Maunakea Invasive Species Management Plan* (Casper, et.al, 2015) would be implemented to minimize the spread of invasive species:

- All vehicles would be externally cleaned at least monthly and the interior maintained in a clean condition at all times prior to arrival at the Saddle Road and Mauna Kea Access Road junction. (SOP #1)
- All vehicles with three or more axles and heavy equipment would be thoroughly cleaned prior to arrival at the Saddle Road and Mauna Kea Access Road junction and inspected by a DLNR-approved biologist. (SOP #1)
- Aggregate and fill materials would be inspected by a DLNR-approved biologist for plant, animal, and earthen materials. Both the load and the site where aggregate and fill materials were extracted or stored would be inspected. (SOP #2)

In addition, vehicles would be restricted to existing roads to minimize the potential spread of invasive species.

Hawaiian Hoary Bat

Although Hawaiian hoary bats are not known to regularly occur within the vicinity of the Proposed Action, the following measures would be implemented to minimize potential impacts:

- There would be no disturbance, removal, or trimming of woody plants greater than 15-foot-tall during the bat birthing and pupping season (June 1 through September 15).

3.4 Scenic Resources

3.4.1 Affected Environment

Scenic resources at Halepōhaku include on-ground resources, scenic vistas (including pu'u), and stargazing. The vicinity of the Proposed Action is highly scenic with foreground views of māmane forest and background views of Maunakea and Mauna Loa volcanoes. The existing facilities at Halepōhaku were constructed with consideration for minimizing visual impacts and are not visible from other locations on the island. The Halepōhaku area is valued for its low light conditions at night that support stargazing opportunities.

The dark skies of Maunakea are a primary reason it is valued for stargazing. Facilities at Halepōhaku, including the VIS, use red lights after dark to not interfere with stargazing while also maintaining safety. Visitors are requested to turn off headlights immediately upon parking to minimize disturbance to stargazers.

3.4.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to scenic resources if it has a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in County or State plans or studies. The Proposed Action would have a significant impact if it would block or substantially obstruct a vista by placing a structure in the foreground so as to prevent a view of an identified resource from an identified area or create a structure that would be so incongruous with existing structures currently in the vista or viewplane.

Construction

Construction of the Proposed Action would minimally adversely affect scenic resources on a short-term basis during the construction period. This would include the presence of construction equipment being transported along Maunakea Access Road to and from the Halepōhaku Mid-Level Support Facility. Construction equipment would also be present at the Halepōhaku Mid-Level Support Facility during construction activities. However, since the site is currently used as equipment storage (see **Photo 2**), the presence of construction equipment would not be a substantial change to existing conditions.



Photo 2: Aerial photo showing existing equipment storage at the proposed project site

Under the No-Action Alternative, no construction activities would take place. The site would continue to be used for equipment storage and there would be no change to existing conditions.

Operation

Operation of the Proposed Action would not adversely impact scenic resources. The Proposed Action would introduce a new visual element into the landscape: the 18-foot dome. As shown in **Figure 3**, the dome structure would be adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility and would not be taller than the existing buildings. Therefore, the Proposed Action would not substantially obstruct a vista by placing a structure in the foreground so as to prevent the view, nor would it be incongruous with existing structures currently in the vista or viewplane.

Under the No-Action Alternative, the new educational telescope would not be constructed, and the site would continue being used for equipment storage. There would be no impacts to visual resources.

3.4.3 Avoidance and Minimization Measures

No avoidance or minimization measures are proposed or expected to be required.

Figure 3. Rendering of Proposed Dome Structure Adjacent to Dorm A



Source: UH Hilo Department of Physics & Astronomy

3.5 Geological Resources

3.5.1 Affected Environment

The Island of Hawai'i is the largest island in the Hawaiian Archipelago and covers an area of approximately 4,000 square miles. The island was formed by the activity of five shield volcanoes: Kohala (long extinct), Maunakea (activity during the recent geologic time), Hualālai (last erupted 1801 to 1803), and Maunaloa and Kīlauea (both still active).

The project site is situated at approximately 9,200-foot msl elevation on the southern flank of Maunakea, which makes up the north-central portion of the island. As shown in **Figure 4**, the project site is underlain by tephra deposits of the Laupāhoehoe Volcanic Series of Maunakea, which were deposited during the Holocene and Pleistocene Epoch. There are no geologically unique features in the project area.

Based on a site reconnaissance, the ground surface at the proposed project site is generally unpaved and slightly sloping down from north to south. Materials exposed at the ground surface generally consist of cinder mixed with volcanic ash. Surface materials are generally dry with relatively low moisture content. Because surface materials are unconsolidated, it is subject to erosion and gullyng by flowing surface water during heavy rainfall.

Boring data from the initial construction of the facilities at Halepōhaku in the 1980s indicate that subsurface materials may generally consist of medium dense cinder sands with some gravel.

3.5.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to geological and soil resources if it would involve a substantial degradation of environmental quality. Therefore, a significant impact would occur if the Proposed Action caused a substantial degradation of environmental quality through erosion.

Construction

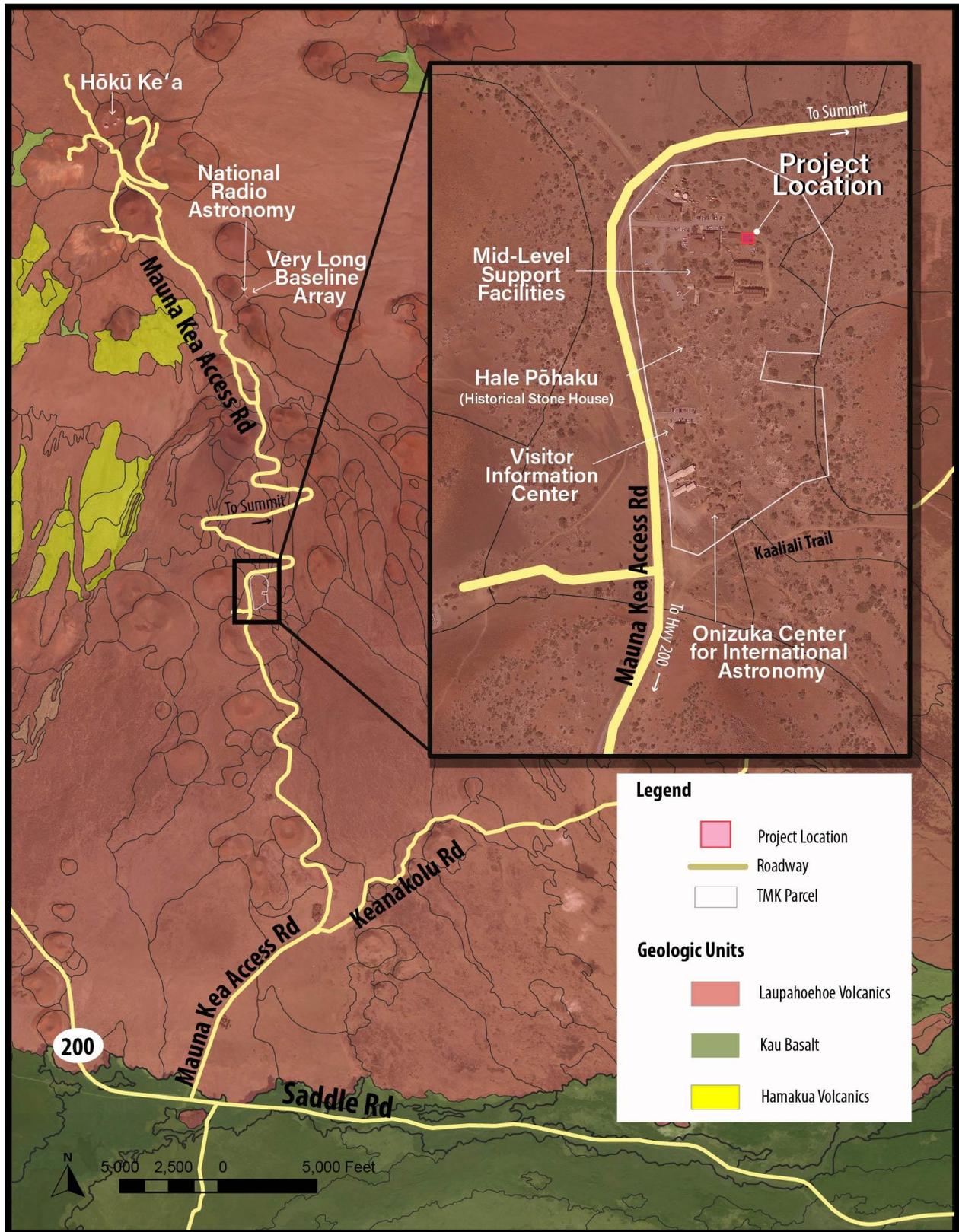
As discussed in **Section 2.1**, construction of the Proposed Action would include site work consisting of excavations and backfills approximately one- to two-feet-thick to achieve the design finished grades. Backfill materials required for the Proposed Action would consist of select granular fills that are non-expansive, and the excavated on-site materials will be reused to the extent practicable as a source of select granular fill materials. Due to the relatively low moisture content of the ground surface, moisture-conditioning of the on-site materials may be required to achieve proper compaction during construction. Compaction would be accomplished by sheepsfoot rollers, vibratory rollers, or other types of acceptable compaction equipment. Construction activities may produce sediment from soil erosion during and after excavation. With the implementation of BMPs, impacts during the short-term construction period would be less than significant.

Under the No-Action Alternative, no construction activities would occur and there would be no impacts to geological resources.

Operation

Operation of the Proposed Action would have no impacts on geological resources.

Figure 4. Geologic Units



3.5.3 Avoidance and Minimization Measures

The following measures would be implemented to minimize impacts to geology and soils:

- All work would comply with the requirements of the CMP and other construction-related plans, including, but not limited to, the following:
 - During all periods of construction, including but not limited to, the delivery of construction materials, there shall be an on-site construction monitor whose primary responsibility shall be to monitor compliance with the CDUP as related to construction activities, as well as any terms and conditions agreed to between the constructing entity and CMS. The construction monitor shall be selected by the CMS with concurrence of the DLNR.
 - A *Best Management Practices Plan for Construction Practices* shall be prepared that covers a range of topics and incorporates sustainable practices, including those related to disturbance of the ground surface and dust generation.
- All construction activities would comply with the provisions of HAR Chapter 11-60.1, Air Pollution Control, and HAR Section 11-60.1-33, Fugitive Dust. A dust control plan would be developed and implemented to minimize fugitive dust during construction, to be approved by the DOH. Measures to control fugitive dust during construction may include, but not be limited to, the following:
 - Watering of active work areas and project access roads, as needed
 - Screening piles of materials from wind, if appropriate
 - Covering open trucks carrying construction materials
 - Limiting areas to be disturbed at any given time
- A geotechnical engineer would monitor the site work operations to observe whether undesirable materials are encountered and confirm whether the exposed subsurface conditions are similar to those anticipated.
- All excavated material not used on-site would be stockpiled on Maunakea and be available for future use. Stockpile locations would be identified in consultation with SHPD and CMS prior to the start of construction.
- All grading would be in conformance with the Hawai'i County Grading Ordinance.
- Installation of a silt fence or equivalent to prevent runoff from the site to adjacent areas.
- All construction would conform to the 2018 International Building Code and the latest State of Hawai'i amendments and ordinances.
- All work would be confined to the designated area of work. Any damage caused by the contractor would be repaired by the contractor.
- Upon completion of construction, it is expected that CMS would plant native vegetation in the area to stabilize the soil.

3.6 Water Resources

3.6.1 Affected Environment

Groundwater

As shown in **Figure 5**, the Proposed Action overlays the Onomea Aquifer System in the East Mauna Kea Aquifer Sector. The highest known elevation of the aquifer on Maunakea is approximately 4,500 feet above msl located in the Maunaloa-Maunakea saddle region; there is no direct data in the immediate vicinity of the Proposed Action. Localized perched or dike-impounded groundwater features are unknown within the vicinity of the Proposed Action. Groundwater levels are assumed to be at significant depths below the ground surface. There are no wells within the vicinity of the Proposed Action.

Surface Waters

There are no permanent streams on the south flank of Maunakea, and the nearest sources of permanent water are springs and seeps located in Waikahalulu Gulch (Wentworth and Powers, 1943). Mean annual rainfall at Halepōhaku is 25.3 inches (WRCC, 2016). Surface water runoff from undisturbed areas occurs when the rainfall rate exceeds the infiltration rate, but the frequency of such events is unknown. There is no history of flooding at Halepōhaku.

3.6.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to water resources if the Proposed Action would involve a substantial degradation of environmental quality or a substantial adverse effect on water quality. Therefore, a significant impact would occur if the Proposed Action affected water resources so that their quality was degraded to the point that they were no longer fit for their designed use and/or the chemical composition exceeded applicable regulatory water standards.

Construction

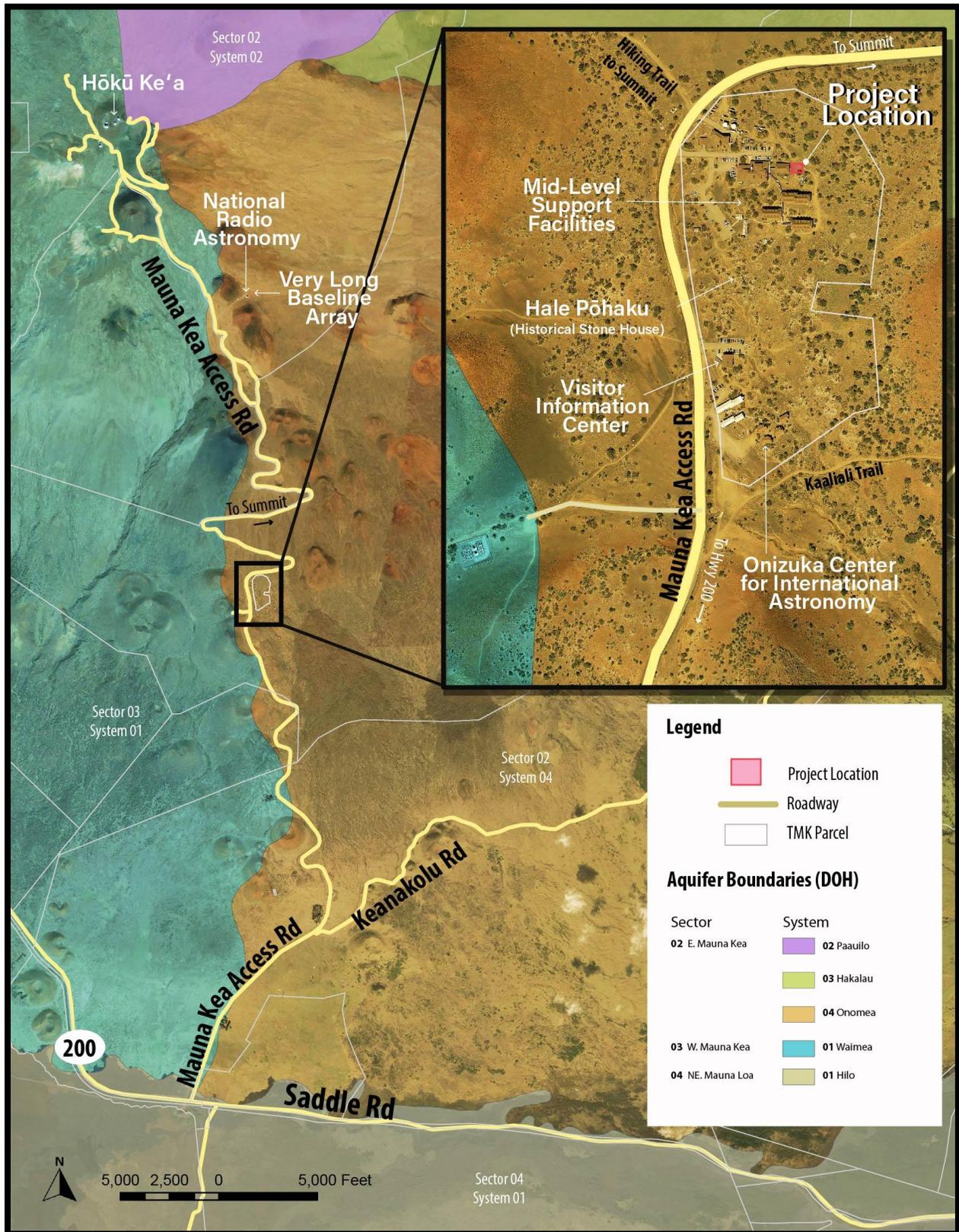
There are no water bodies at the project site; therefore, there would be no direct impacts to surface waters from construction of the Proposed Action. Construction activities may produce sediment from soil erosion during and after excavation. With the implementation of BMPs, impacts to water resources during the short-term construction period would be less than significant.

Under the No-Action Alternative, no construction activities would occur and there would be no impacts to water resources.

Operation

The telescope would be housed in a dome structure installed on an elevated deck system, and there would be minimal changes to flowing surface water during heavy rainfall. Operation and maintenance of the facility would not involve the use of chemicals that could leak and percolate into groundwater.

Figure 5. Aquifers



3.6.3 Avoidance and Minimization Measures

The following measures would be implemented to minimize potential impacts to water resources:

- Construction plans and specifications would include BMPs to minimize erosion on the project site during and after construction, as well as measures to contain runoff on-site during construction.
- Temporary erosion control measures would be used during construction to prevent soil loss and to minimize surface runoff.

3.7 Air Quality

3.7.1 Affected Environment

The Clean Air Act of 1972 and its 1990 Amendments (CAA) and subsequent legislation regulate air emissions from area, stationary, and mobile sources. Both the U.S. Environmental Protection Agency (USEPA) and the State of Hawai'i have instituted Ambient Air Quality Standards (AAQS) to maintain air quality in the interest of public health and secondary public welfare.

At the present time, seven parameters are regulated: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. The Hawai'i AAQS are in some cases considerably more stringent than the comparable National Ambient Air Quality Standards (NAAQS). In particular, the Hawai'i 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit. **Table 6** illustrates the NAAQS and State AAQS and the units of measure (micrograms per cubic meter [$\mu\text{g}/\text{m}^3$] and parts per million [ppm]).

In addition to the NAAQS and the State AAQS, the State of Hawai'i Department of Health (DOH) regulates fugitive dust. HAR Section 11-60.1-33, Fugitive Dust, states that no person shall cause or permit visible fugitive dust to become airborne without taking reasonable precautions, and no person shall cause or permit the discharge of visible fugitive dust beyond the property lot line on which the fugitive dust originates (DOH, 2014). This rule applies to construction projects and would, therefore, be applicable to the Proposed Action.

Prevailing winds throughout the year in Hawai'i are the northeasterly trade winds. These trade winds generally help maintain good air quality conditions. The DOH operates a network of air quality monitoring stations at various locations around the state; however, there are no air quality monitoring stations at or near Maunakea. However, the persistent winds and location above the tradewind inversion assist in maintaining excellent air quality at Halepōhaku by dispersing volcano-induced vog and human derived pollution.

Locally generated contributors to air pollution in the vicinity of the project site include vehicle exhaust, chemical fumes from construction and maintenance activities, and fugitive dust from various sources, including vehicles traveling on unpaved surfaces and road grading and construction or other activities occurring on unpaved roads. Air pollutants are rapidly dispersed by strong winds.

Table 6. State of Hawai'i and National Ambient Air Quality Standards

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawai'i
Particulate Matter <10 microns (PM ₁₀)	µg/m ³	Annual	-	-	50
		24 Hours	150 ^a	150 ^a	150 ^b
Particulate Matter <2.5 microns (PM _{2.5})	µg/m ³	Annual	12 ^c	15 ^c	-
		24 Hours	35 ^d	35 ^d	-
Sulfur Dioxide (SO ₂)	ppm	Annual	-	-	0.03
		24 Hours	-	-	0.14 ^b
		3 Hours	-	0.5 ^b	0.5 ^b
Nitrogen Dioxide (NO ₂)	ppm	1 Hour	0.075 ^e	-	-
		Annual	0.053	0.053	0.04
Carbon Monoxide (CO)	ppm	8 Hours	9 ^b	-	4.4 ^b
		1 Hour	35 ^b	-	9 ^b
Ozone (O ₃)	ppm	8 Hours	0.070 ^g	0.070 ^g	0.08 ^g
Lead	µg/m ³	3 Months	0.15 ^h	0.15 ^h	-
		Quarter	1.5 ⁱ	1.5 ⁱ	1.5 ⁱ
Hydrogen Sulfide	ppb	1 Hour	-	-	25 ^b

Notes: ^aNot to be exceeded more than once per year on average over three years.

^bNot to be exceeded more than once per year.

^cThree-year average of the weighted annual arithmetic mean.

^d98th percentile value averaged over three years.

^eThree-year average of fourth-highest daily 1-hour maximum.

^f98th percentile value of the daily 1-hour maximum averaged over three years.

^gThree-year average of annual fourth-highest daily 8-hour maximum.

^hRolling 3-month average.

ⁱQuarterly average.

Source: DOH, 2015

3.7.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to air quality if it would result in a substantial degradation of environmental quality, or have a substantial adverse effect on air quality, or require substantial energy consumption or emit substantial greenhouse gases. Therefore, the Proposed Action's impact to air quality would be considered significant if it would result in emissions of air pollutants that could substantially impair the existing air quality through generation of substantial pollutant concentrations, lead to the area becoming a non-attainment area for State AAQS and NAAQS, or substantially emit greenhouse gases.

Construction

Construction of the Proposed Action would have short-term and temporary impacts to air quality from the generation of dust or particulate matter and exhaust fumes from vehicular travel to and from the project site and from equipment operations during construction activities. Construction activities would include grading and vehicle and equipment engine operations. Because the level of criteria pollutants in Hawai'i are consistently below Federal and State AAQS, and because air pollutants are rapidly dispersed by strong winds, increasing levels of criteria pollutants at the project site from construction activities are not expected to exceed the Federal or State AAQS.

Under the No-Action Alternative, no construction activities would occur; therefore, there would be no impact to the existing air quality.

Operation

The Proposed Action would not result in the release of air pollutants. The only impacts to air quality during operation of the Proposed Action would be from the generation of dust or particulate matter and exhaust fumes from vehicular travel to and from the project site. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom; therefore, vehicular travel to the site would be minimal and intermittent and result in less than significant impacts to air quality.

Under the No-Action Alternative, the new educational telescope would not be constructed at Halepōhaku; therefore, there would be no impact to the existing air quality.

3.7.3 Avoidance and Minimization Measures

The following measures would be implemented to minimize impacts to air quality:

- All work would comply with the requirements of the CMP and other construction-related plans, including, but not limited to, the following:
 - A *Best Management Practices Plan for Construction Practices* shall be prepared that covers a range of topics and incorporates sustainable practices, including those related to disturbance of the ground surface and dust generation.
- All construction activities would comply with the provisions of HAR Chapter 11-60.1, Air Pollution Control, and HAR Section 11.60.1-33, Fugitive Dust. A dust control plan would be developed and implemented to minimize fugitive dust during construction, to be approved by the DOH. Measures to control fugitive dust during construction may include, but not be limited to, the following:
 - Watering of active work areas and project access roads, as needed
 - Screening piles of materials from wind, if appropriate
 - Covering open trucks carrying construction materials
 - Limiting areas to be disturbed at any given time
- Contractors would be required to maintain equipment with emissions controls.

3.8 Climate and Climate Change

3.8.1 Affected Environment

The climate at Halepōhaku is dry and cool with an annual mean rainfall of approximately 25.3 inches (WRCC, 2016) with the wettest months occurring November through March. The temperature ranges between 30 degrees Fahrenheit (°F) and 70°F (Giambelluca et al., 2014). Precipitation in the form of snow is rare at Halepōhaku. Prevailing winds are from the northeast.

There is a scientific consensus that the earth is warming due to manmade increases in greenhouse gases in the atmosphere, according to the United Nation's Intergovernmental Panel on Climate Change. Global mean air temperatures are projected to increase by at least 2.7°F by the end of the century if production of greenhouse gases continues at their current rate or increases in the future. This will be accompanied by the warming of ocean waters, which is expected to be highest in tropical and subtropical seas of the Northern Hemisphere. Wet and dry season contrasts will increase, and wet tropical areas are likely to experience more frequent and extreme precipitation.

For Hawai'i, where warming air temperatures are already quite apparent, not only is the equable climate at risk but also agriculture, ecosystems, the visitor industry, and public health. In Hawai'i the key consideration regarding climate change is sea level rise. This is not of concern for this project due to its location near the summit of Maunakea. However, climate change could result in noticeable changes to the climate and vegetation zones of Maunakea. Drought conditions occurred on Maunakea in 74% of the months between 2000 and 2011 and are expected to increase in frequency and intensity. When drought occurs, māmane trees produce fewer seed pods. Fewer seed pods results in less food for palila which in turn impacts survival and reproduction rates of palila. Climate change is likely to alter the palila's available habitat, including that at and around Halepōhaku (MKFRP, 2021).

3.8.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to climate change if it would require substantial energy consumption or emit substantial greenhouse gases. Therefore, the Proposed Action's impact to climate change would be considered significant if it would substantially emit greenhouse gases.

Construction

Construction of the Proposed Action would be determined to result in the short-term and temporary release of greenhouse gases from vehicular and equipment engine operations. Construction of the Proposed Action would not substantially emit greenhouse gases as emissions would be short-term and temporary during construction activities.

Under the No-Action Alternative, no construction activities would occur; therefore, there would be no impact to the existing air quality.

Operation

The Proposed Action would not result in the release of greenhouse gases. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom; therefore, vehicular travel to the site would be minimal and intermittent and not substantially result in the emission of greenhouse gases.

Under the No-Action Alternative, the new educational telescope would not be constructed at Halepōhaku; therefore, there would be no additional release of greenhouse gases from vehicular travel to the site.

3.8.3 Avoidance and Minimization Measures

No avoidance or minimization measures are proposed or expected to be required.

3.9 Noise

3.9.1 Affected Environment

Noise is defined as “any sound that may produce adverse physiological or psychological effects or interfere with individual or group activities, including but not limited to communication, work, rest, recreation, or sleep” (HAR Title 11, Chapter 46). A number of factors affect sound as it is perceived by the human ear. These include the actual level of the sound (i.e., noise), the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels (HAR, Title, Chapter 200.1 – Occupational Noise Exposure).

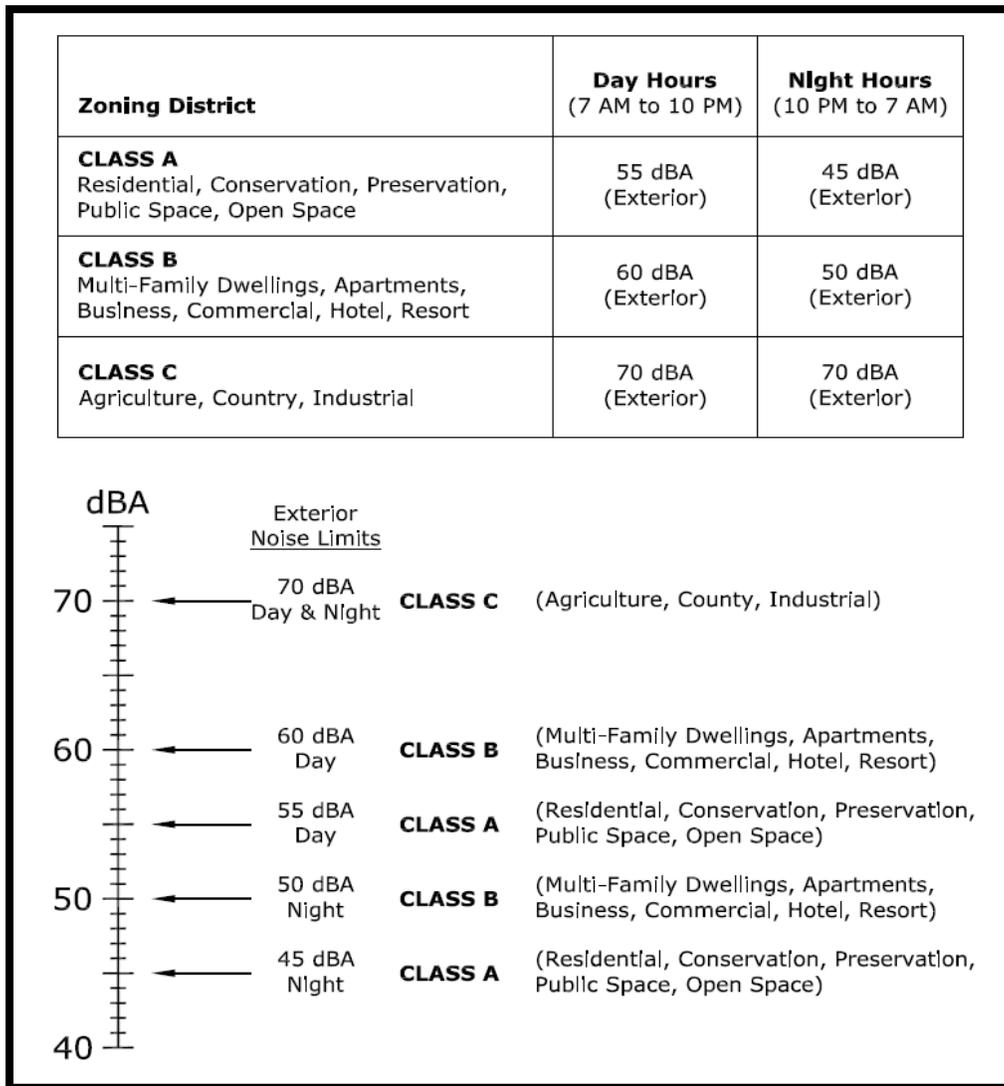
The State of Hawai'i Community Noise Control Rules (HAR Title 11, Chapter 46) defines three classes of zoning districts and specifies corresponding maximum permissible sound levels due to stationary noise sources such as air-conditioning units, exhaust systems, and generators. The accepted unit of measure for noise levels is the decibel (dB). The Community Noise Control Rules do not address most moving sources, such as vehicular traffic noise, air traffic noise, or rail traffic noise. However, the Community Noise Control Rules do regulate noise related to construction activities, which may not be stationary.

The State of Hawai'i regulates noise exposure in the following statutes and rules:

- HRS Chapter 342F – Noise Pollution
- HAR, Title 11, Chapter_46 – Community Noise Control

The maximum permissible noise levels are enforced by the DOH for any location at or beyond the property line and shall not be exceeded for more than 10% of the time during any 20-minute period. The specified noise limits which apply are a function of the zoning and time of day as shown in **Figure 6**. With respect to mixed zoning districts, the rule specifies that the primary land use designation shall be used to determine the applicable zoning district class and the maximum permissible sound level. In determining the maximum permissible sound level, the background noise level is considered by the DOH.

Figure 6. Hawai'i Maximum Permissible Sound Levels for Various Zoning Districts



As discussed in **Section 4.1.2**, the designated land use of the project area is Conservation. This puts the project area in a Class A Zoning District with a maximum permissible sound level during daytime hours (7 AM to 10 PM) of 55 dBA and a maximum permissible sound level of 45 dBA during nighttime hours (10 PM to 7 AM) as measured at the property line of the parcel.

The project site is adjacent to Dorm A, which is used by resident and visiting astronomy personnel to rest and sleep during the day.

3.9.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant noise impact if it has a substantial adverse effect on ambient noise

levels. Therefore, a significant noise impact would occur if there are increased ambient noise levels to the extent that noise-sensitive receptors would be exposed to noise exceeding regulatory levels.

Construction

Construction of the Proposed Action would be determined to result in short-term and temporary noise during daylight hours. The use of heavy equipment and small power equipment would be required to construct the facility. This noise may disturb resident and visiting astronomy personnel, especially any day sleepers that may be present.

Construction noise may also impact cultural practitioners and practices in the vicinity of the Proposed Action. The increase in noise levels would be short-term and temporary and would not prevent cultural practices from occurring. As with other projects in the UH Management Areas on Maunakea, quiet periods can be requested during construction to accommodate cultural practices. Concerned individuals can inquire at the VIS, go to the construction monitor, or contact CMS directly to make the request.

Under the No-Action Alternative, no construction activities would occur; therefore, there would be no noise impacts.

Operation

Operation of the Proposed Action would not increase ambient noise levels since telescope operations are mostly quiet. The dome would open and close a minimum of twice a night. The dome emits a quiet buzzing sound during opening/closing), an operation that takes about 20 seconds. People in the area of the deck would be able to hear the opening/closing of the dome, but it would not significantly contribute an increase in ambient noise levels. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom. Student groups may occasionally be on-site to get on-site training, but they would not significantly contribute an increase in ambient noise levels.

Under the No-Action Alternative, the new educational telescope would not be constructed; therefore, there would be no increase in ambient noise levels.

3.9.3 Avoidance and Minimization Measures

The following measures would be implemented to minimize noise impacts associated with the Proposed Action:

- Noise generated from short-term construction activities and the use of machinery would be minimized by requiring contractors to adhere to State and County noise regulations, including HRS Chapter 342F, Noise Pollution, and HAR Chapter 11-46, Community Noise Control.
- The construction contractor would coordinate with CMS to anticipate, identify, and mitigate potential noise issues that could adversely impact dormitory residents.

3.10 Roadways and Traffic

3.10.1 Affected Environment

The Halepōhaku facilities are accessed via the Maunakea Access Road, which is a 16.3-mile-long road that runs from Saddle Road (State Route 200) to the Maunakea summit. The road is paved between Saddle Road and Halepōhaku and 20-feet-wide. Past Halepōhaku, the road to the summit is gravel for 4.6 miles and then paved for the remaining portion of the road to the summit. Vehicles traveling on Maunakea Access Road mainly belong to people that work on Maunakea (e.g., astronomers, CMS staff, and the Maunakea Rangers). Other vehicles traveling along Maunakea Access Road consist of both kama'āina and out-of-state visitors.

Access to the project site would be via a gravel road off Maunakea Access Road that is currently used to access the existing equipment storage area and greenhouse.

3.10.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact if it involves a substantial degradation of environmental quality. Therefore, the Proposed Action would have a significant impact if it would increase traffic resulting in a substantial deterioration of traffic conditions and/or requiring additional road improvements beyond minor modifications at the access point and routine maintenance.

Construction

Construction of the Proposed Action would have minor, short-term direct and indirect impacts on Saddle Road and Mauna Kea Access Road from project-related vehicles, equipment and materials delivery/removal, and personnel access to the project site. The number of personnel during construction would be minimal, and travel to the site is not expected to increase traffic in a way to substantially deteriorate traffic conditions. Regular traffic flow along Maunakea Access Road would be maintained.

Transportation of equipment and materials to and from the project site would require oversized and/or overweight loads. The contractor would be required to obtain a permit from the Hawai'i Department of Transportation (HDOT) to transport oversized and/or overweight materials and equipment on State highways.

Under the No-Action Alternative, no construction activities would occur and there would be no transportation-related impacts.

Operation

Operation of the Proposed Action would have minimal impacts to roadways and traffic. There would be on-site activity once or more each week for maintenance, change of instruments, or other necessary activities. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom. In cases where student groups are getting on-site training, they would be transported to the site via van or bus. Overall, there would not be a significant increase of traffic or impacts to roadways

Under the No-Action Alternative, the new educational telescope would not be constructed; therefore, there would be no impacts to roadways and traffic.

3.10.3 Avoidance and Minimization Measures

The following measures would be implemented to minimize impacts to traffic and transportation systems:

- Equipment and materials would be transported to and from the project site during non-peak hours.
- The construction contractor would comply with all provisions of the HDOT permit to transport oversized and/or overweight materials and equipment on State highways.
- All construction vehicles would be maintained in proper operating condition and loads would be properly secured to prevent dust, debris, leakage, or other adverse conditions from affecting public roadways.
- The construction contractor would be required to repair any damage to existing pavement, markings, roadways, parking, or walkways damaged due to construction activities.

3.11 Socioeconomics

3.11.1 Affected Environment

The Proposed Action is located within the Hāmākua District of the island of Hawai'i. The Hāmākua District is a relatively sparsely populated district with the majority of the population located in towns near the coast. According to the *Hawai'i County Data Book* (COH DRP, 2015), the Hāmākua District had 6,513 residents in 2010, which is approximately 3.5% of the total population of the county. The population of the Hāmākua District is located in small communities along the Hāmākua Coast, including Āhualoa, Honoka'a, Kukuihaele, Pa'auilo, and Pāpa'aloa. There are no permanent residents on Maunakea, although there are three dorm buildings with a total of 72 rooms at the Halepōhaku Mid-Level Support Facility that provide lodging for guests, although Halepōhaku does not provide lodging to the public. Services at Halepōhaku are managed by CMS.

Astronomy is an important industry in Hawai'i and in particular on the Island of Hawai'i. It is estimated that in 2012 there were \$58.43 million of expenditures attributed to astronomy activities in Hawai'i County that generated \$91.48 million in local business sales, \$27.98 million in employee earnings, \$4 million in state tax revenues, and over 800 jobs (UHERO, 2014).

3.11.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to socioeconomics if the Proposed Action would have a substantial adverse effect on the economic or social welfare of the community or State. This means, a significant socioeconomic impact would occur if the Proposed Action was found to adversely affect the revenue, employment, or overall economic conditions of the island community or the state as a whole.

Construction

Construction of the Proposed Action would not increase the population of the area. Construction activities would result in temporary, positive economic activity in the form of construction jobs and material procurements.

Under the No-Action Alternative, no construction activities would take place and there would not be temporary, positive economic activity in the form of construction jobs and material procurements. In addition, there would be additional cost associated with finding another location to install the 28-inch telescope, 18-foot dome enclosure, and related instrumentation that were financed by the State through CIP funding and delivered to UH Hilo in 2016.

Operation

During the operational phase, the facility would mostly be operated by the faculty members and students from the UH Hilo Department of Physics and Astronomy. UH Hilo Department of Physics and Astronomy provides the Director of the observatory, a faculty astronomer with a large fraction of his/her time focusing on operations, training, and facility improvements. Technical and operational support would be provided by a technician to be added to the department and by the current departmental educational specialist.

The telescope would be operated at night by observatory staff, students, and department faculty members. Student assistants and experienced faculty would assist from time-to-time with routine observatory maintenance or with instrumental developments and testing. Observations would mostly take place from the remote observing room in the Science and Technology Building on the UH Hilo campus; other observing sessions mostly for facility testing and instrumentation preparation might occur on-site. The facility would eventually also be operated under a robotic mode.

One departmental vehicle would be available 24 hours a day, 7 days a week for support of operations; another vehicle (from the Department of Physics and Astronomy or the UH Hilo motor pool) may be used from time to time as needed, for transportation of material or student groups.

The initial operating budget, exclusive of salaries, would be approximately \$50,000 per year, which would cover software licenses, facility repairs, minor upgrades, preventive maintenance, etc. The modest increase in employment would generate a small increase in direct spending, which in turn would generate further economic activity.

The Proposed Action is also expected to attract both Hawaii and off-island students to UH Hilo's Physics and Astronomy program, and therefore to Hawai'i. There is the potential for collaboration with other observatories around the world, which would further enhance the teaching and research opportunities. The Hawaii and off-island students will receive training in the physical sciences and, upon completion of their terminal degree, will have the training to be employed in technically challenging fields which are typically compensated at a higher level than those without such training. The availability of this cohort locally will support the diversification of Hawai'i Island's economy beyond tourism and agriculture.

No significant adverse impacts to the existing socioeconomic environment at the local and regional level are expected since the Proposed Action essentially entails enhancement of an existing activity already within the region.

Under the No-Action Alternative, the new educational telescope would not be constructed; therefore, the positive economic benefits associated with operation of the facility, although minimal, would not be realized.

3.11.3 Avoidance and Minimization Measures

No avoidance or minimization measures are proposed or expected to be required.

3.12 Public Facilities and Services

3.12.1 Affected Environment

Police

The County of Hawai'i Police Department is divided into two patrol districts: Area I (East Hawaii) and Area II (West Hawaii). The Proposed Action is located in the Hāmākua District of Area I. The nearest police stations to the project area are Waimea Station (approximately 47 miles from the project site) and Hilo Station (approximately 43 miles from the project site).

Fire

The County of Hawai'i Fire Department is primarily responsible for fire protection and suppression, pre-hospital emergency medical services, land and sea search and rescue, hazardous materials response, ocean safety, and fire prevention and public education for the County of Hawai'i. There are 20 full time fire and medic stations and 20 volunteer fire stations across the island.

Medical Services

There are five hospitals on the island of Hawai'i. The hospitals closest to the project site are the North Hawai'i Community Hospital in Waimea with 33 beds (approximately 46 miles from the project site) and the Hilo Medical Center with 276 beds (approximately 41 miles from the project site).

Schools

There are 40 public schools on the Island of Hawai'i: 23 kindergarten through 5th/6th grade, three kindergarten through 8th/9th grade, five 6th/7th through 8th grade, six 9th through 12th grade, two 7th through 12th grade, and one kindergarten through 12th grade. In addition, there are 15 public charter schools (three elementary/intermediate and 12 high school grade levels), 16 private schools (seven serving through 12th grade), and two community schools (i.e., adult education) on the island of Hawai'i.

Recreation Areas

There are several recreation areas on the island of Hawai'i. The nearest improved recreation area to the project site is the Gilbert Kahele Recreation Park, which is located approximately 6.7 miles northwest of the intersection of Mauna Kea Access Road and Saddle Road.

Recreational activities in and around Halepōhaku include hiking, sightseeing, and stargazing, as well as engaging in educational experiences. Hikes on trails of varying lengths can be accessed from Halepōhaku. Hunting also occurs frequently in the Mauna Kea Forest Reserve, which surrounds Halepōhaku but does not overlap the parcel.

3.12.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact to public facilities and services if the Proposed Action involves substantial secondary impacts such as population changes or effects on public facilities that would impact public health. Therefore, a significant impact on public facilities or services would occur if the Proposed Action caused a substantial change in population or adversely affected public facilities.

Construction

Construction of the Proposed Action would require construction personnel that would be sourced from the local workforce. Therefore, the Proposed Action would not cause population changes that could cause a strain on public facilities (e.g., schools and recreation areas) and services (e.g., fire, police, and medical). Due to the remote location of the project site, there would be no impact to emergency vehicle access during construction. It is not anticipated that construction activities would result in an increase in calls for fire, police, or medical services. However, if an incident were to occur during construction that required fire, police, or medical attention, it is anticipated that the level of demand could be met by the existing fire, police, and emergency medical services force. Therefore, the Proposed Action would not have a significant impact on emergency services.

Under the No-Action Alternative, there would be no construction activities; therefore, there would be no impacts on public facilities and services.

Operation

Operation of the Proposed Action would have no impacts on police, fire, or medical services, nor would it have any impacts to recreation areas. The Proposed Action would have beneficial impacts to schools by providing an increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy.

Under the No-Action Alternative, the new educational telescope would not be constructed, and the benefits to schools would not be realized.

3.12.3 Avoidance and Minimization Measures

No avoidance or minimization measures are proposed or expected to be required.

3.13 Natural Hazards

3.13.1 Affected Environment

Floods

The Federal Emergency Management Agency (FEMA) creates Flood Insurance Rate Maps (FIRM) that delineate flood hazard areas. The FEMA FIRM flood zone designations include the following:

- A – Areas of 100-year flood, base flood elevations not determined
- AE – Areas of 100-year flood, base flood elevation determined
- XS – Areas of 500-year flood; areas of 100-year flood with average depths of less than one foot or within the drainage area less than one square mile, and areas protected by levees from 100-year flood
- X – Areas determined to be outside the 500-year floodplain
- D – Areas in which flood hazard is undetermined
- VE – Areas of 100-year coastal flood with velocity (wave action), base flood elevations determined (Coastal High Hazard District)

As shown in **Figure 7**, the Proposed Action is located in Flood Zone D, an area in which flood hazard is undetermined. However, flooding is not known to occur at the Halepōhaku Mid-Level Support Facility.

Earthquakes

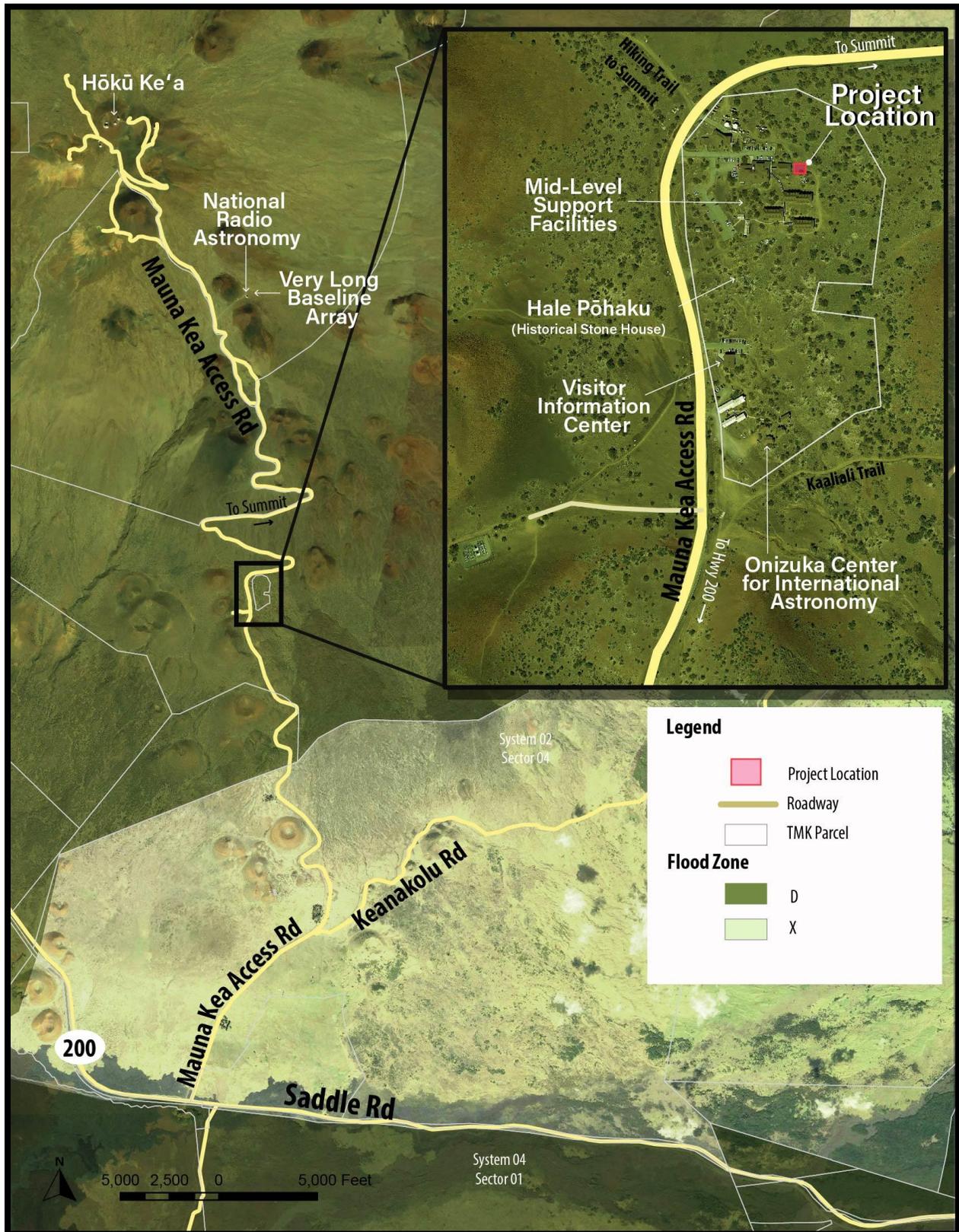
Strong earthquakes endanger people and property by shaking structures and by causing ground cracks, ground settling, and landslides. The size of an earthquake is commonly expressed by its magnitude on the Richter scale, which is a measure of the relative size of the earthquake wave recorded on seismographs. Thousands of earthquakes occur every year in Hawai'i, most on and around the island of Hawai'i. Many of these earthquakes are directly related to volcanic activity.

Hurricanes and Tropical Storms

The Hawaiian Islands are seasonally affected by Pacific hurricanes from June through November. On average, there are between four and five tropical cyclones observed in the Central Pacific every year. The state has been affected by significant hurricanes and tropical storms over the years. These include Hiki (1950), Nina (1957), Dot (1959), Iwa (1982), 'Iniki (1992), Iselle (2014), Lane (2018), and Olivia (2018).

According to a report presented at the International Union of Conservation of Nature World Conservation Congress, global climate change could mean that Hawai'i may experience more frequent and more severe hurricanes in the future.

Figure 7. Flood Hazard Zones



3.13.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact if it would have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain. Therefore, a significant impact would occur if the Proposed Action was substantially adversely impacted by natural hazards.

Construction

Construction of the Proposed Action would not create conditions that would exacerbate natural hazards. The County of Hawai'i Civil Defense directs and coordinates the County's emergency preparedness and response program to ensure prompt and effective action when natural or man-caused disaster threatens or occurs anywhere in the County of Hawai'i. Construction personnel would respond to any emergency messages or alerts, as appropriate, to ensure their safety during construction activities.

Under the No-Action Alternative, no construction activities would occur and there would be no change in existing conditions.

Operation

Operation of the Proposed Action would not create conditions that would exacerbate natural hazards. The telescope and dome facility would be designed and constructed to withstand natural hazards. Any personnel on site during telescope operations would respond to any emergency messages or alerts, as appropriate, to ensure their safety during construction activities.

Under the No-Action Alternative, the new educational telescope would not be constructed at Halepōhaku, and there would be additional personnel at the project site. Therefore, there would be no change in existing conditions.

3.13.3 Avoidance and Minimization Measures

No avoidance or minimization measures are proposed or expected to be required.

3.14 Solid and Hazardous Waste

3.14.1 Affected Environment

Lehua Environmental Inc. (LEI) conducted a targeted soil screen for contaminants of potential concern within the soils of the site for the Proposed Action in September 2020. The *Targeted Soil Screen Report* is included with this EA in **Appendix D**.

The objective of the targeted soil screen was to identify the presence (if any) of arsenic, barium, cadmium, chromium, lead, selenium, silver, mercury, and organochlorinated pesticide contaminated soil within the planned areas of soil disturbance. The results of the analysis were used to determine if these soils may pose a potential health risk to construction workers, building tenants, and the public during construction and to determine appropriate soil management and disposal practices, if needed.

Both arsenic and lead were identified in soils at the proposed new educational telescope site between zero and six inches below ground surface (bgs); however, they were at levels well below the DOH's Environmental Action Level (EAL). Arsenic, lead, and barium were identified in soils at the proposed new educational telescope site between six to 18 inches bgs in levels well below the DOH's EAL. No other contaminants of potential concern were identified.

3.14.2 Potential Impacts

Based on the significance criteria set forth in HAR Chapter 11-200.1, the Proposed Action would be determined to result in a significant impact from hazardous materials if it would have a substantial adverse effect on public health or involve a substantial degradation of environmental quality. Therefore, a significant impact would occur if the Proposed Action released or disturbed hazardous materials that could be harmful to humans or the environment.

Construction

Construction of the Proposed Action is not expected to have impacts from the presence of hazardous materials since the levels of contaminants of potential concern were not identified above the DOH's EALs. Construction activities may result in an accidental spill of petroleum or other hazardous products if construction equipment were to break down. Impacts would be minimized through the implementation of the measures identified in **Section 3.14.3**.

Under the No-Action Alternative, no construction would occur; therefore, there would be no solid or hazardous waste impacts.

Operation

No hazardous materials would be used during operation of the new educational telescope; therefore, the Proposed Action would not have any impacts associated with hazardous materials.

Under the No-Action Alternative, the new educational telescope would not be constructed, and the site would continue to be used for equipment storage. The storage of equipment could result in leaks of hazardous materials.

3.14.3 Avoidance and Minimization Measures

The following measures would be implemented to minimize potential solid and hazardous waste impacts:

- All project construction-related debris would be removed and disposed of at an approved site.
- A contingency plan for accidental spills of petroleum products would be developed and retained on site. Absorbent pads and other applicable spill containment materials would be stored on site to facilitate with clean-up of accidental petroleum releases.

3.15 Secondary and Cumulative Impacts

3.15.1 Secondary Impacts

Secondary impacts are those effects that are caused by an action and are later in time or farther removed in distance but are reasonably foreseeable. They may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related to effects on air and water or other natural systems. The Proposed Action would not have growth-inducing effects or changes in the pattern of land use, or related effects on air, water, or other natural systems. The Proposed Action would be determined to result in an increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy. Therefore, secondary impacts from the Proposed Action would be beneficial.

3.15.2 Cumulative Impacts

Cumulative impacts refer to the impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant impacts taking place over time. No other actions have occurred or are expected to occur in the future. The impacts associated with the Proposed Action would either be beneficial or short-term and temporary, and there would be no cumulative impacts.

4.0 Relationship to Land Use Plans and Policies

4.1 State of Hawai'i Planning Documents

4.1.1 The Hawai'i State Plan

The Hawai'i State Plan, codified as HRS Chapter 226, provides goals, objectives, policies, and priorities for the State. The Hawai'i State Plan also provides a basis for determining priorities, allocating limited resource, and improving coordination of State and County plans, policies, programs, projects, and regulatory activities. It establishes a set of themes, goals, objectives, and policies that are meant to guide the State's long-range growth and development activities. Applicable sections of HRS Chapter 226 to the Proposed Action are shown in **Table 7** and discussed below.

Table 7. Summary of Applicability of HRS Chapter 226 to the Proposed Action

HRS Chapter 226 Hawai'i State Planning Act	Applicability to Project
Part I. Overall Theme, Goals, Objectives, and Policies	
§226-5 Objective and policies for population	Not applicable
§226-6 Objectives and policies for the economy--in general	Applicable
§226-7 Objectives and policies for the economy-- agriculture	Not applicable
§226-8 Objective and policies for the economy--visitor industry	Not applicable
§226-9 Objective and policies for the economy--federal expenditures	Not applicable
§226-10 Objective and policies for the economy--potential growth and innovative activities	Applicable
§226-10.5 Objectives and policies for the economy--information industry	Not applicable
§226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources	Applicable
§226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources	Applicable
§226-13 Objectives and policies for the physical environment--land, air, and water quality	Not applicable
§226-14 Objective and policies for facility systems--in general	Not applicable
§226-15 Objectives and policies for facility systems--solid and liquid wastes	Not applicable
§226-16 Objective and policies for facility systems--water	Not applicable
§226-17 Objectives and policies for facility systems--transportation	Not applicable
§226-18 Objectives and policies for facility systems--energy	Not applicable
§226-18.5 Objectives and policies for facility systems--telecommunications	Not applicable
§226-19 Objectives and policies for socio-cultural advancement--housing	Not applicable
§226-20 Objectives and policies for socio-cultural advancement--health	Not applicable
§226-21 Objective and policies for socio-cultural advancement--education	Applicable
§226-22 Objective and policies for socio-cultural advancement--social services	Not applicable
§226-23 Objective and policies for socio-cultural advancement--leisure	Not applicable
§226-24 Objective and policies for socio-cultural advancement--individual rights and personal well-being	Not applicable
§226-25 Objective and policies for socio-cultural advancement--culture	Not applicable
§226-26 Objective and policies for socio-cultural advancement--public safety	Not applicable
§226-27 Objective and policies for socio-cultural advancement--government	Not applicable
Part III. Priority Guidelines	
§226-103 Economic priority guidelines	Applicable

HRS Chapter 226 Hawai'i State Planning Act	Applicability to Project
§226-104 Population growth and land resources priority guidelines	Not applicable
§226-105 Crime and criminal justice	Not applicable
§226-106 Affordable housing	Not applicable
§226-107 Quality education	Applicable
§226-108 Sustainability	Not applicable
§226-109 Climate change adaptation priority guidelines	Applicable

Section 226-6. Objectives and policies for the economy – in general.

- (a) Planning for the State's economy in general shall be directed toward the achievement of the following objectives:
- (1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai'i's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.
 - (2) A steadily growing and diversified economic base that is not overly dependent on a few industries and includes the development and expansion of industries on the neighbor islands.
- (b) To achieve the general economic objectives, it shall be the policy of this State to:
- (4) Transform and maintain Hawai'i as a place that welcomes and facilitates innovative activity that may lead to commercial activities.
 - (5) Promote innovative activity that may pose initial risks, but ultimately contribute to the economy of Hawai'i.
 - (7) Expand existing markets and penetrate new markets for Hawai'i's products and services.
 - (17) Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.
 - (20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new or innovative potential growth industries in particular.

Discussion: The Proposed Action would be mostly used by UH Hilo and University of Hawai'i Mānoa for their undergraduate astronomy programs, but time would be available for all students across the UH system. Specifically, the Purpose of the Proposed Action is:

- To conduct scientific research projects,
- To train students in modern observational techniques applied in scientific research,
- To train students in modern telescope operations,
- To support developments in instrumentation and technical projects,
- To support outreach activities and student training in communicating science with the general public, and

- To serve as a bridge between professional astronomy activities on the Big Island and local communities.

UH faculty and students would use the telescope for laboratories and research projects as well as for outreach events and programs involving the community. In addition, the Proposed Action could be used to build scientific and educational collaborations around the world, including other educational institutions and serious citizen astronomers. UH Hilo would work closely with local high schools and the community to develop opportunities in conducting observations with the new educational telescope. Enhancing educational opportunities in the STEM fields will contribute to a better educated workforce with higher level skills that would further support development of a technology industry.

Section 226-10. Objective and policies for the economy – potential growth and innovative activities.

- (a) Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objectives of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawai'i's economic base.
- (b) To achieve the potential growth and innovative activity objective, it shall be the policy of this State to:
 - (1) Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawai'i's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors.
 - (12) Develop, promote, and support research and educational and training programs that will enhance Hawai'i's ability to attract and develop economic activities of benefit to Hawai'i.

Discussion: Astronomy is an important industry in Hawai'i and in particular on the Island of Hawai'i. It is estimated that in 2012 there were \$58.43 million of expenditures attributed to astronomy activities in Hawai'i County that generated \$91.48 million in local business sales, \$27.98 million in employee earnings, \$4 million in state tax revenues, and over 800 jobs (UHERO, 2014). The Proposed Action includes the construction and operation of a new educational telescope at Halepōhaku, which would result in an increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy.

Section 226-11. Objectives and policies for the physical environment – land-based, shoreline, and marine resources.

- (a) Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:
 - (1) Prudent use of Hawai'i's land-based, shoreline, and marine resources.
 - (2) Effective protection of Hawai'i's unique and fragile environmental resources.
- (b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:
 - (3) Take into account the physical attributes of areas when planning and designing activities and facilities.
 - (8) Pursue compatible relationships among activities, facilities, and natural resources.

Discussion: The Proposed Action is located inland away from shoreline and marine resources. Construction of the Proposed Action would include ground-disturbing activities which may produce sediment from soil erosion during and after excavation. BMPs would be implemented during construction to minimize potential impacts to land-based, shoreline, and marine resources.

Section 226-12. Objectives and policies for the physical environment – scenic, natural beauty, and historic resources.

- (a) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.
- (b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:
 - (1) Promote the preservation and restoration of significant natural and historic resources.
 - (3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.
 - (4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.

Discussion: The Proposed Action would introduce a new visual element into the landscape: the 18-foot dome. The dome structure would be adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility and would not be taller than the existing buildings. Due to the location of the Proposed Action, there would not be a substantial impact to views and vistas. In addition, there are no historic properties within or immediately adjacent to the project site; therefore, there would be no direct impacts to historic resources.

Section 226-21. Objectives and policies for socio-cultural advancement – education.

- (a) Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.
- (b) To achieve the education objective, it shall be the policy of this State to:
 - (2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.
 - (5) Provide higher educational opportunities that enable Hawai'i's people to adapt to changing employment demands.
 - (8) Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.
 - (9) Support research programs and activities that enhance the education programs of the State.

Discussion: The Proposed Action would be mostly used by UH Hilo and University of Hawai'i Mānoa for their undergraduate astronomy programs, but time would be available for all students across the UH system. Specifically, the Purpose of the Proposed Action is:

- To conduct scientific research projects,
- To train students in modern observational techniques applied in scientific research,
- To train students in modern telescope operations,
- To support developments in instrumentation and technical projects,
- To support outreach activities and student training in communicating science with the general public, and
- To serve as a bridge between professional astronomy activities on the Big Island and local communities.

UH faculty and students would use the telescope for laboratories and research projects as well as for outreach events and programs involving the community. In addition, the Proposed Action could be used to build scientific and educational collaborations around the world, including other educational institutions and serious citizen astronomers. UH Hilo would work closely with local high schools and the community to develop opportunities in conducting observations with the new educational telescope.

Section 226-103. Economic priority guidelines.

- (a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai'i's people and achieve a stable and diversified economy.
 - (1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.
 - (B) Encourage investments in innovative activities that have a nexus to the State, such as:
 - (ii) Academic support from an institution of higher education in Hawai'i.
 - (iv) Resources unique to Hawai'i that are required for innovative activities.

Discussion: Astronomy is an important industry in Hawai'i and in particular on the Island of Hawai'i. It is estimated that in 2012 there were \$58.43 million of expenditures attributed to astronomy activities in Hawai'i County that generated \$91.48 million in local business sales, \$27.98 million in employee earnings, \$4 million in state tax revenues, and over 800 jobs (UHERO, 2014). The Proposed Action would support the educational and research goals of UH Hilo's Department of Physics and Astronomy. The UH Hilo Physics and Astronomy programs provide a unique and excellent undergraduate education within the College of Natural Science and Health Sciences. All faculty have active research projects that provide opportunities for students to gain valuable experience through internships and directed-studies courses. The programs are designed to prepare students for a wide range of careers in physics and astronomy, including fundamental research, education, and public outreach, to data science, engineering, and a wide variety of technology-related fields. Many career options are available in these fields without the need for additional graduate studies.

Section 226-107. Quality education. Priority guidelines to promote quality education.

- (6) Pursue the establishment of Hawai'i's public and private universities and colleges as research and training centers of the Pacific.

Discussion: The UH Hilo Physics and Astronomy programs provide a unique and excellent undergraduate education within the College of Natural Science and Health Sciences. All faculty have active research projects that provide opportunities for students to gain valuable experience through internships and directed-studies courses. The programs are designed to prepare students for a wide range of careers in physics and astronomy, from fundamental research, education, and public outreach, to data science and engineering. Many career options are available in these fields without the need for additional graduate studies.

The Proposed Action would support the educational and research goals of UH Hilo's Department of Physics and Astronomy. UH faculty and students would use the telescope for laboratories and research projects as well as for outreach events and programs involving the community. In addition, the Proposed Action could be used to build scientific and educational collaborations around the world, including other educational institutions and serious citizen astronomers. UH Hilo would work closely with local high schools and the community to develop opportunities in conducting observations with the new educational telescope.

Section 226-109. Climate change adaptation priority guidelines: Priority guidelines to prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy shall:

- (10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy.

Discussion: The Proposed Action would not result in the release of greenhouse gases. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom; therefore, vehicular travel to the site would be minimal and intermittent and not substantially result in the emission of greenhouse gases.

The following themes of Part I of the Hawaii State Plan are not applicable to the Proposed Action for the following reasons:

- **Section 226-5.** Objective and policies for population: The Proposed Action would not result in population growth.
- **Section 226-7.** Objectives and policies for the economy – agriculture. The Proposed Action is located on Maunakea and would have no impacts on agriculture.
- **Section 226-8.** Objectives and policies for the economy – visitor industry. The Proposed Action does not involve the visitor industry.
- **Section 226-9.** Objective and policies for the economy – federal expenditures: The Proposed Action does not include the use of federal funds.
- **Section 226-10.5.** Objective and policies for the economy – information industry: The Proposed Action does not include nor impact telecommunications or information technology resources.

- **Section 226-13.** Objectives and policies for the physical environment – land, air, and water quality. The Proposed Action does not include activities aimed at improving the quality of Hawai'i's land, air, and water resources, although BMPs would be employed to minimize impacts to land, air, and water resources.
- **Section 226-14.** Objectives and policies for facility systems – in general. The Proposed Action does not include development of any water, transportation, waste disposal, or energy and telecommunication facilities.
- **Section 226-15.** Objective and policies for facility systems – solid and liquid wastes. The Proposed Action does not include development of solid or liquid waste facilities.
- **Section 226-16.** Objective and policies for facility systems – water. The Proposed Action does not include development or use of water supply systems.
- **Section 226-17.** Objectives and policies for facility systems – transportation. The Proposed Action does not include transportation systems.
- **Section 226-18.** Objectives and policies for facility systems – energy. The Proposed Action does not involve energy generation.
- **Section 226-18.5.** Objective and policies for facility systems – telecommunications. The Proposed Action does not include new telecommunication facilities.
- **Section 226-19.** Objectives and policies for socio-cultural advancement – housing. The Proposed Action does not include development of housing.
- **Section 226-20.** Objectives and policies for socio-cultural advancement – health. The Proposed Action does not include health facilities or services.
- **Section 226-22.** Objectives and policies for socio-cultural advancement – social services. The Proposed Action does not include social services or activities.
- **Section 226-23.** Objectives and policies for socio-cultural advancement – leisure. The Proposed Action does not include the provision of resources to accommodate diverse cultural, artistic, and recreational activities.
- **Section 226-24.** Objectives and policies for socio-cultural advancement – individual rights and personal well-being. The Proposed Action would have no impact to personal rights and personal well-being.
- **Section 226-25.** Objectives and policies for socio-cultural advancement – culture. The Proposed Action does not include activities that would impede the enhancement of cultural identities, traditions, values, customs, and arts.
- **Section 226-26.** Objectives and policies for socio-cultural advancement – public safety. The Proposed Action does not include public safety programs.
- **Section 226-27.** Objectives and policies for sociocultural advancement – government. The Proposed Action would have no impact on government services.

The themes of Part II of the Hawaii State Plan are not applicable to the Proposed Action since the Proposed Action does not involve the preparation of planning documents.

The following themes of Part III of the Hawaii State Plan are not applicable to the Proposed Action for the following reasons:

- **Section 226-104.** Population growth and land resources priority guidelines. The Proposed Action would not result in population growth nor any change in land use.
- **Section 226-105.** Crime and criminal justice. The Proposed Action does not involve the criminal justice system.
- **Section 226-106.** Affordable housing. The Proposed Action would not provide housing.
- **Section 226-108.** Sustainability. The Proposed Action would have no impact on sustainability.

4.1.2 State Land Use Law

Hawai'i was the first of the fifty States to have a State Land Use Law and a State Plan. Today, Hawai'i remains unique among the fifty states with respect to the extent of control that the state exercises in land use regulation. The State Land Use Law, HRS Chapter 205, was originally adopted by the State Legislature in 1961. This law establishes an overall framework of land use management whereby all lands in the State of Hawai'i are classified into one of four land use districts: Urban, Agricultural, Conservation, and Rural.

The Board of Land and Natural Resources is charged with identifying, permitting, and regulating uses within the conservation district under HRS Chapter 183C and HRS Section 205-5.

Discussion: As shown in **Figure 8** and **Figure 9**, the Proposed Action is located within the Resource subzone of the Conservation District. The objective of the Resource subzone is "to ensure, with proper management, the sustainable use of the natural resources of those areas" (HAR Section 13-5-13).

Halepōhaku is currently approved for the use of providing support facilities for science activities, which includes the Mid-Level Support Facility (including a common building, dormitory, and maintenance area) for astronomers, a Visitor Information Station with parking for the public, a construction camp, and a staging area.

Figure 8. State Land Use Districts

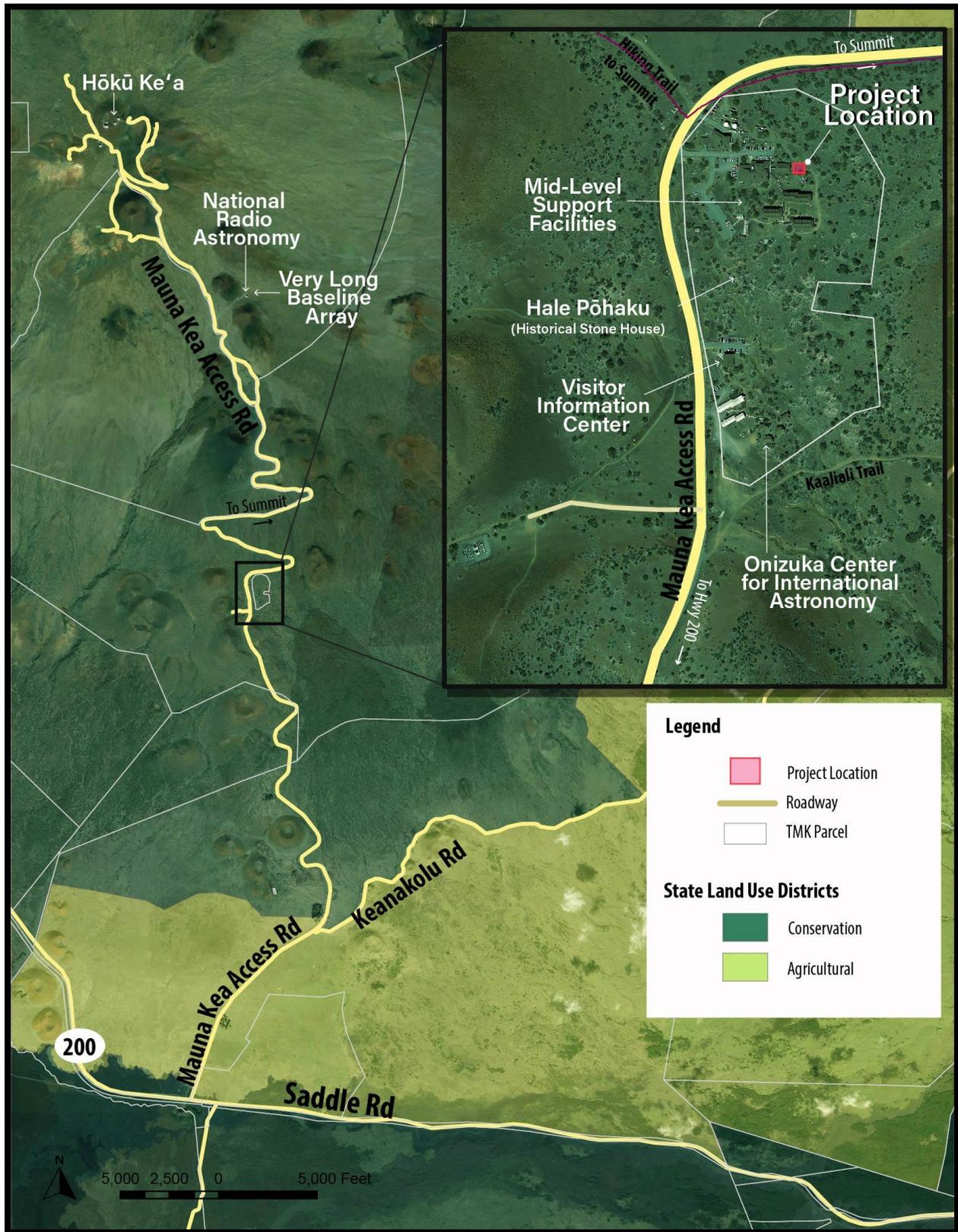
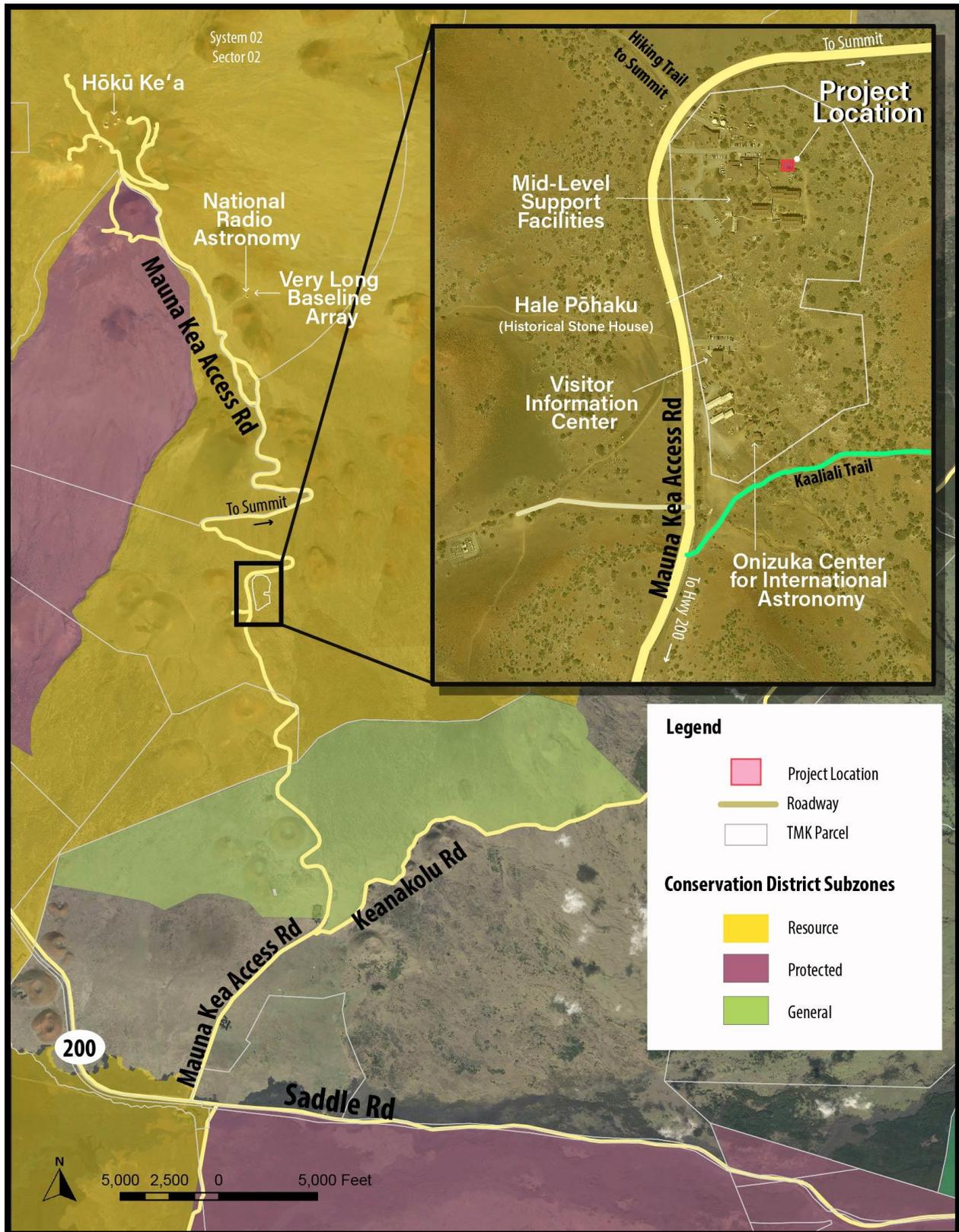


Figure 9. Conservation District Subzones



4.1.3 Hawai'i Coastal Zone Management Program

The National Coastal Zone Management (CZM) Program was created with the passage of the Coastal Zone Management Act of 1972 (CZMA). Hawai'i's CZM Program, established pursuant to HRS Chapter 205A, as amended, is administered by the State of Hawai'i Office of Planning and provides for the beneficial use, protection, and development in the State's coastal zone. The objectives and policies of the Hawai'i CZM Program encompass a wide array of concerns including impacts to recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the management of development. The Hawai'i CZM area includes all lands within the State and the areas seaward to the extent of the State's management jurisdiction. Therefore, the Proposed Action is located within the CZM area.

The Proposed Action is consistent with the following objectives and policies of the Hawai'i CZM Program:

RECREATIONAL RESOURCES

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

- 1) Improve coordination and funding of coastal recreational planning and management.
- 2) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:
 - a) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas.
 - b) Requiring replacement of coastal resources having significant recreational value including, but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable.
 - c) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value.
 - d) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.
 - e) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources.
 - f) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.
 - g) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing.
 - h) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Hawai'i Revised Statutes, section 46-6.

Discussion: The Proposed Action is located at the Halepōhaku Mid-Level Support Facility on Maunakea and would have no impacts on coastal recreational opportunities.

HISTORIC RESOURCES

Objective: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

- 1) Identify and analyze significant archaeological resources.
- 2) Maximize information retention through preservation of remains and artifacts or salvage operations.
- 3) Support state goals for protection, restoration, interpretation, and display of historic resources

Discussion: Construction of the Proposed Action would not result in any adverse impacts to any above-ground archaeological resources. Based on multiple archaeological studies that have included both surface and subsurface scrutiny, there is a possibility of subsurface deposits in the area based on the recording of several non-contiguous archaeological sites near the site of the Proposed Action. However, due to previous disturbance of the area, it is unlikely that subsurface archaeological deposits or human burials are present within the APE for the Proposed Action. Minimization measures would be implemented, as required by the CMP and the CRMP, to minimize potential impacts to archaeological and historic resources, as discussed in **Section 3.2.3**.

SCENIC AND OPEN SPACE RESOURCES

Objective: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

- 1) Identify valued scenic resources in the coastal zone management area.
- 2) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.
- 3) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources.
- 4) Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: The Proposed Action would introduce a new visual element into the landscape: the 18-foot dome. The dome structure would be adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility and would not be taller than the existing buildings. Due to the location of the Proposed Action, there would not be a substantial impact to views and vistas.

COASTAL ECOSYSTEMS

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

- 1) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources.
- 2) Improve the technical basis for natural resource management.
- 3) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance.
- 4) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land water uses, recognizing competing water needs.
- 5) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: The Proposed Action is located at the Halepōhaku Mid-Level Support Facility on Maunakea and would have no impacts to coastal ecosystems.

ECONOMIC USES

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

- 1) Concentrate coastal development in appropriate areas.
- 2) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area.
- 3) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such development and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
 - a) Use of presently designated locations is not feasible;
 - b) Adverse environmental effects are minimized; and
 - c) The development is important to the State's economy.

Discussion: The Proposed Action is located on the slopes of Maunakea and does not include development in coastal areas. The selected site within Halepōhaku provides desirable teaching, access, and astronomical conditions.

COASTAL HAZARDS

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:

- 1) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards.
- 2) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards.
- 3) Ensure that developments comply with requirements of the Federal Flood Insurance Program.
- 4) Prevent coastal flooding from inland projects.

Discussion: The Proposed Action is located at the Halepōhaku Mid-Level Support Facility on Maunakea and would not be impacted by coastal hazards.

MANAGING DEVELOPMENT

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

- 1) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development.
- 2) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements.
- 3) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion: Prior to the preparation of the Draft EA, a pre-assessment consultation letter was sent to Federal, State, and County agencies; elected officials; non-governmental organizations; Native Hawaiian Organizations; and other interested parties. The letter, dated February 8, 2021, provided a summary of the project background, Proposed Action, and community engagement activities, and requested comments on the Proposed Action. Twenty-nine comments were received.

UH Hilo also initiated a separate public outreach campaign in September and October 2020 at the request of the UH Board of Regents for additional community outreach prior to moving ahead with further plans. This outreach was aimed at informing and educating the public about the new educational telescope and UH Hilo's desire to install it at Halepōhaku. Comments were received through an online open house website and documented at the end of the outreach process. A total of 355 individual comments were submitted. MKMB expressed interest in the outreach efforts and received a presentation on the final results during their regular meeting on January 12, 2021.

The Draft EA is being provided for public comment and review. To facilitate the agency review process for the required permits for the Proposed Action, UH Hilo would meet with the various agencies prior to

submitting permit application packages. The permit review process would provide additional opportunities for public involvement.

PUBLIC PARTICIPATION

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

- 1) Promote public involvement in coastal zone management processes.
- 2) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities.
- 3) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion: Prior to the preparation of the Draft EA, a pre-assessment consultation letter was sent to Federal, State, and County agencies; elected officials; non-governmental organizations; Native Hawaiian Organizations; and other interested parties. The letter, dated February 8, 2021, provided a summary of the project background, Proposed Action, and community engagement activities, and requested comments on the Proposed Action. Twenty-nine comments were received.

UH Hilo also initiated a separate public outreach campaign in September and October 2020 at the request of the UH Board of Regents for additional community outreach prior to moving ahead with further plans. This outreach was aimed at informing and educating the public about the new educational telescope and UH Hilo's desire to install it at Halepōhaku. The primary goal of the outreach effort was to communicate the proposed new telescope's educational and community uses, purpose, size, location, and components to the public and to collect input. Due to the COVID-19 pandemic, face-to-face engagement with stakeholders and the community was not considered for public health concerns. Consequently, the public outreach effort consisted of 100% virtual engagement tools. These tools included the following:

- **Virtual Open House.** A virtual open house website was developed and launched for a 30-day period during which the public was invited to visit the website to learn more about the proposed new educational telescope and the proposed site and to leave comments.
- **Informational and Promotional Materials.** The project team developed informational material to be used and shared publicly via the open house website, through direct emails and press releases, and at stakeholder meetings.
- **Stakeholder Meetings.** Stakeholders from community organizations, civic clubs, educational institutes, and other relevant organizations were invited to attend a virtual meeting via the Zoom web conferencing platform to learn about the proposed project and to discuss any questions or concerns.

The majority of the community feedback content was received through the virtual open house comment form submissions. A total of 355 individual comments were submitted. MKMB expressed interest in the outreach efforts and received a presentation on the final results during their regular meeting on January 12, 2021.

BEACH PROTECTION

Objective: Protect beaches for public use and recreation.

Policies:

- 1) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion.
- 2) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities.
- 3) Minimize the construction of public erosion-protection structures seaward of the shoreline.
- 4) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor.
- 5) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.

Discussion: The Proposed Action is located at the Halepōhaku Mid-Level Support Facility on Maunakea and would have no impact to beaches.

MARINE RESOURCES

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

- 1) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial.
- 2) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency.
- 4) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone.
- 5) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources.
- 6) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion: The Proposed Action is located at the Halepōhaku Mid-Level Support Facility on Maunakea and would have no impact to marine resources.

4.2 County of Hawai'i Planning Documents

4.2.1 Hawai'i County General Plan

The *County of Hawai'i General Plan*, February 2005 (as amended) (2005 General Plan) is the policy document for the long-range comprehensive development of the island of Hawaii. The purposes of the General Plan are as follows:

- Guide the pattern of future development in this County based on long-term goals;
- Identify the visions, values, and priorities important to the people of this County;
- Provide the framework for regulatory decisions, capital improvement priorities, acquisition strategies, and other pertinent government programs within the County organization and coordinated with State and Federal programs.
- Improve the physical environment of the County as a setting for human activities; to make it more functional, beautiful, healthful, interesting, and efficient.
- Promote and safeguard the public interest and the interest of the County as a whole.
- Facilitate the democratic determination of community policies concerning the utilization of its natural, man-made, and human resources.
- Effect political and technical coordination in community improvement and development.
- Inject long-range considerations into the determination of short-range actions and implementation.

The County's existing 2005 General Plan is currently undergoing revision. The initial draft of the new General Plan 2040 has undergone public review and the recommended plan has been prepared. Public review of the recommended plan is currently undergoing public review, and the plan is expected to be adopted in late-2021. Upon completion of public review, the recommended plan will undergo Planning Commission review and Hawai'i County Council review and adoption.

The following analyzes the Proposed Action's consistency with the goals and policies of the 2005 General Plan. The Proposed Action is consistent with the following applicable goals and policies of the 2005 General Plan:

ECONOMIC

Goals:

- (h) Promote and develop the island of Hawai'i into a unique scientific and cultural model, where economic gains are in balance with social and physical amenities. Development should be reviewed on the basis of total impact on the residents of the County, not only in terms of immediate short run economic benefits.

Policies:

- (b) Encourage the expansion of the research and development industry by working with and supporting the University of Hawai'i at Hilo and West Hawai'i, the Natural Energy Laboratory at Hawai'i Authority, and other agencies' programs that support sustainable economic development in the County of Hawai'i.

- (f) Support all levels of educational, employment, and training opportunities and institutions.
- (i) Continue to encourage the research, development, and implementation of advanced technologies and process.
- (j) Support the development of high technology industries.

Hāmākua District Courses of Action:

- (f) Support the growth of astronomical research and development.

Discussion: The Proposed Action includes the construction and operation of a new educational telescope at the existing Halepōhaku Mid-Level Support Facility to support UH Hilo's Department of Physics and Astronomy. The Proposed Action would be mostly used by UH Hilo and University of Hawai'i Mānoa for their undergraduate astronomy programs, but time would be available for all students across the University of Hawai'i (UH) system. UH faculty and students would use the telescope for laboratories and research projects as well as for outreach events and programs involving the community. In addition, the Proposed Action could be used to build scientific and educational collaborations around the world, including other educational institutions and serious citizen astronomers. UH Hilo would work closely with local high schools and the community to develop opportunities in conducting observations with the new educational telescope.

ENVIRONMENTAL QUALITY

Goals:

- (a) Define the most desirable uses of land within the County that achieves an ecological balance providing residents and visitors the quality of life and an environment in which the natural resources of the island are viable and sustainable.
- (b) Maintain and, if feasible, improve the existing environmental quality of the island.
- (c) Control pollution.

Policies:

- (a) Take positive action to further maintain the quality of the environment.

Standards:

- (b) Incorporate environmental quality controls either as standards in appropriate ordinances or as conditions of approval.
- (c) Federal and State environmental regulations shall be adhered to.

Discussion: The Proposed Action would have short-term and temporary impacts during construction to cultural practices, biological resources, scenic resources, geological resources, water resources, air quality, noise, roadways and traffic, and solid and hazardous waste. BMPs and other measures would be implemented to minimize impacts.

HISTORIC SITES

Goals:

- (a) Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawai'i.

Policies:

- (c) Require both public and private developers of land to provide historical and archaeological surveys and cultural assessments, where appropriate, prior to the clearing or development of land when there are indications that the land under consideration has historical significance.

Discussion: PCSI conducted an ALRFI in October 2019 and a CSR in December 2020 for the Proposed Action. Construction of the Proposed Action would not result in any adverse impacts to any above-ground archaeological resources (see **Section 3.2.2**) nor would not impede cultural practices (see **Section 0**) but would result in an increase in noise levels (see **Section 3.9.2**) that could impact cultural practitioners and practices in the vicinity of the Proposed Action. The increase in noise levels would be short-term and temporary and would not prevent cultural practices from occurring. In addition, the construction contractor would coordinate with CMS to anticipate, identify, and mitigate potential noise issues that could adversely impact dormitory residents. Operation of the Proposed Action would not adversely affect gathering of cultural resources or impede access to areas utilized for subsistence hunting and gathering.

Based on multiple archaeological studies that have included both surface and subsurface scrutiny, there is a possibility of subsurface deposits in the area based on the recording of several non-contiguous archaeological sites near the site of the Proposed Action. However, due to previous disturbance of the area, it is unlikely that subsurface archaeological deposits or human burials are present within the APE for the Proposed Action. The measures identified in **Section 3.2.3** would be implemented to minimize impacts.

NATURAL BEAUTY

Goals:

- (a) Protect, preserve, and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.
- (b) Protect scenic vistas and view planes from becoming obstructed.

Policies:

- (h) Protect the views of areas endowed with natural beauty by carefully considering the effects of proposed construction during all land use reviews.
- (i) Do not allow incompatible construction in areas of natural beauty.

Discussion: The Proposed Action would not adversely impact scenic resources. The Proposed Action would introduce a new visual element into the landscape: the 18-foot dome. The dome structure would be adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility and would not be taller than the existing buildings. Therefore, the Proposed Action would not substantially obstruct a vista by placing a structure in the foreground so as to prevent the view, nor would it be incongruous with existing structures currently in the vista or viewplane.

NATURAL RESOURCES AND SHORELINE

Goals:

- (b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.
- (f) Ensure that alterations to existing landforms, vegetation, and construction of structures cause minimum adverse effect to water resources, scenic and recreational amenities, and minimum danger of floods, landslides, erosion, siltation, or failure in the event of an earthquake.

Policies:

- (u) Ensure that activities authorized or funded by the County do not damage important natural resources.

Discussion: The Proposed Action would have short-term and temporary impacts during construction to biological resources, scenic resources, geological resources, and water resources. BMPs and other measures would be implemented to minimize impacts. The telescope and dome facility would be designed and constructed to withstand natural hazards. The Proposed Action is located in Flood Zone D, an area in which flood hazard is undetermined. However, flooding is not known to occur at the Halepōhaku Mid-Level Support Facility.

LAND USE – PUBLIC LANDS

A well-balanced land use pattern capable of meeting the future needs of the County is an essential part of the General Plan. The Land Use Pattern Allocation Guide (LUPAG), part of the Hawai'i County General Plan, is a design tool that guides the direction and quality of future developments. Specifically, LUPAG designations guide decisions related to future land use.

Goals:

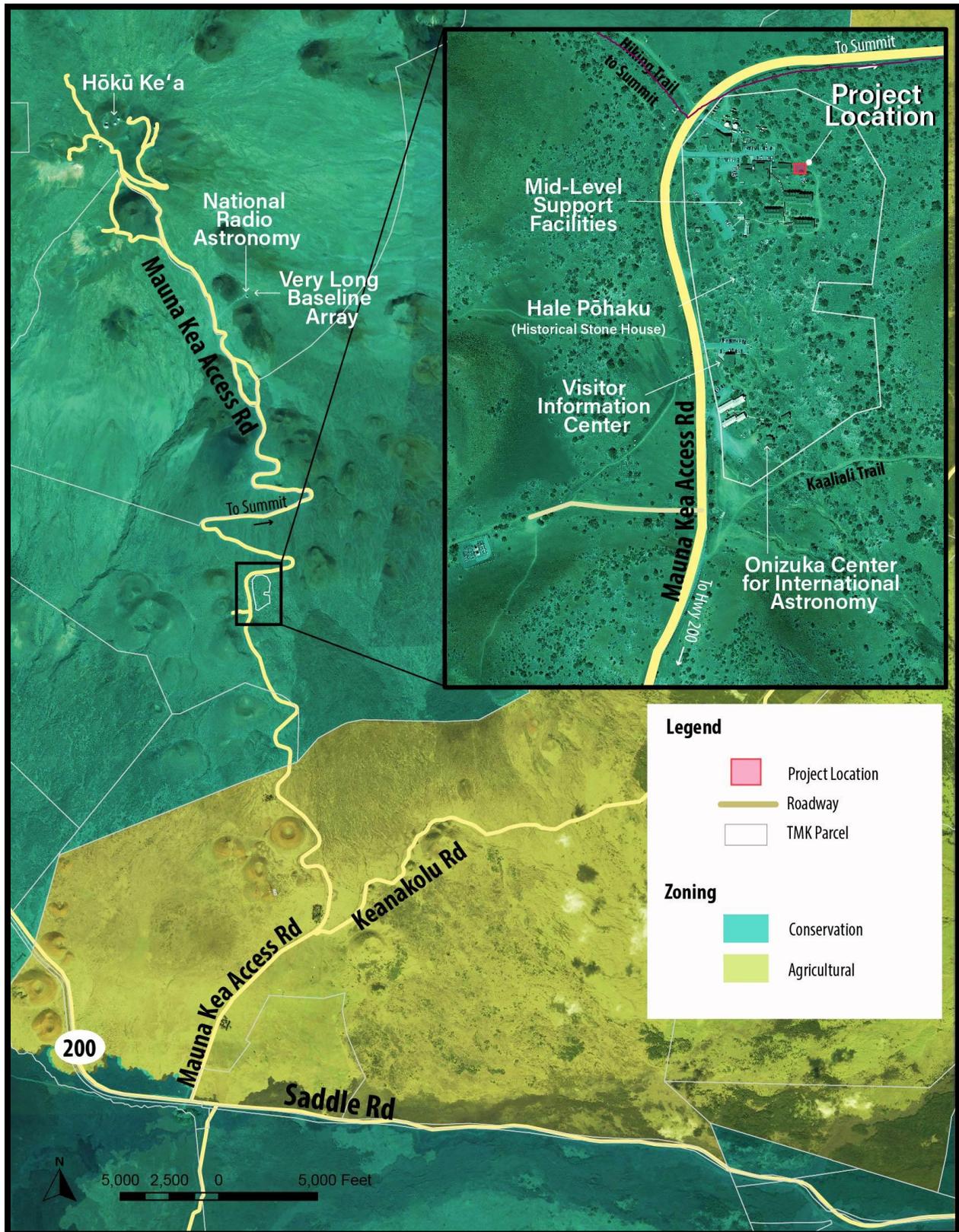
- (a) Utilize publicly owned lands in the best public interest and to the maximum benefit for the greatest number of people.

Policies:

- (a) Encourage uses of public lands that will satisfy specific public needs, such as housing, recreation, open space, and education.

Discussion: As shown in **Figure 10**, the Proposed Action is located in the Conservation Area. The Conservation Area consists of forest and water reserves, natural and scientific preserves, areas in active management for conservation purposes, areas to be kept in a largely natural state with minimal facilities consistent with open space uses (e.g., picnic pavilions and comfort stations), and lands within the State Land Use Conservation District. Future development in LUPAG-designated Conservation Areas that are also within the State Land Use Conservation District is determined through the authorized uses in the State Land Use Law. As discussed in **Section 4.1.2**, Halepōhaku is currently approved for the use of providing support facilities for science activities.

Figure 10. Land Use Pattern Allocation Guide Districts



4.2.2 Hawai'i County Zoning Code

The County of Hawai'i did not have island-wide zoning until 1967. Prior to that, only Hilo and some other towns were zoned. Zoning is the main county land use control. All areas on the island, except for Federal lands like national parks and some areas in the conservation district, are zoned. The Zoning Code lists the permitted uses within each zone. Permitting uses are those that are allowed without further Planning Department or Planning Commission approval.

Discussion: The Proposed Action is located within the Maunakea Forest Reserve (Conservation District). Additional land use controls through the Hawai'i County Zoning Code are not applied to these lands.

4.2.3 Hāmākua Community Development Plan

The *Hāmākua Community Development Plan* (CDP) is an official plan that translates the broad goals and objectives of the *Hawai'i County General Plan* to the unique needs and conditions of the Hāmākua CDP Planning Area, which encompasses the judicial districts of Hāmākua and North Hilo and a portion of the South Hilo district commonly referred to as Rural South Hilo. CDPs do the following: establish County policy, direct County actions, guide the policy and actions of State and Federal agencies, and focus and guide community actions.

The Proposed Action is located on Maunakea at the Halepōhaku Mid-Level Support Facility. These lands are out of County jurisdiction and are under the jurisdiction of DLNR with portions leased to UH and managed by CMS. The Hāmākua CDP focuses on “Kōkua Actions” to the agencies and groups that currently manage resources at the summit and near-summit lands. The following analyzes the Proposed Action’s consistency with the following applicable Kōkua Action outlined in the Hāmākua CDP:

- **Kōkua Action 36:** Provide natural and cultural resource preservation orientation training for tour operators, rangers, VIS staff, and volunteers in coordination with native practitioners who practice on Maunakea.

Discussion: As required by the CMP and the CRMP to minimize potential impacts to cultural practices and beliefs, all persons involved with construction activities shall attend a mandatory training about the cultural and historical resources on Maunakea.

4.2.4 Special Management Area

The Special Management Area (SMA) is the area of the island that is in close proximity to the shoreline. The SMA permit was established in 1975 with the enactment of Act 176, Shoreline Protection Act. Pursuant to HRS Chapter 205A, all state and county agencies shall enforce the CZM objectives and policies defined in HRS Section 205A-2 (see **Section 4.1.3**). The County of Hawai'i Planning Department administers SMA permits for the island of Hawaii.

The Proposed Action is inland, away from shoreline, and is not located within the SMA.

5.0 Findings and Conclusions

5.1 Significance Criteria

HAR Chapter 11-200.1 provides significance criteria for which all projects in Hawaii are assessed. These significance criteria and their relationship to the Proposed Action are as follows:

(1) Irrevocably commit a natural, cultural, or historic resource.

The Proposed Action would not irrevocably commit a natural, cultural, or historic resource. Construction of the Proposed Action would result in minimal vegetation clearing. Vegetation disturbance would be restricted to the extent necessary to complete construction of the Proposed Action. The existing māmane tree is not located within the project footprint and would not be impacted by construction.

In addition, construction of the Proposed Action would not result in any adverse impacts to any above-ground archaeological resources, including SIHP 50-10-23-10314, SIHP 50-10-23-09074, SIHP 50-10-23-09075, and SIHP 50-10-23-09076. Based on multiple archaeological studies that have included both surface and subsurface scrutiny, there is a possibility of subsurface deposits in the area based on the recording of several non-contiguous archaeological sites near the site of the Proposed Action. However, due to previous disturbance of the area, it is unlikely that subsurface archaeological deposits or human burials are present within the APE for the Proposed Action.

(2) Curtail the range of beneficial uses of the environment.

The Proposed Action would be located in an area adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility. The site is currently used for equipment storage. The Proposed Action would not result in significant impacts to the environment. The majority of potential impacts would be short-term and temporary. The Proposed Action would have beneficial impacts to education due to the increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy.

(3) Conflict with the State's environmental policies or long-term environmental goals established by law.

HRS Chapter 344 states that "It shall be the policy of the State, through its programs, authorities, and resources to:

- (1) Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawaii.
- (2) Enhance the quality of life by:
 - a. Setting population limits so that the interaction between the natural and artificial environments and the population is mutually beneficial;

- b. Creating opportunities for the residents of Hawaii to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environments;
- c. Establishing communities which provide a sense of identity, wise use of land, efficient transportation, and aesthetic and social satisfaction in harmony with the natural environment which is uniquely Hawaiian; and
- d. Establishing a commitment on the part of each person to protect and enhance Hawaii's environment and reduce the drain on nonrenewable resources."

As discussed in **Section 3.0**, the Proposed Action would have short-term and temporary impacts during construction that would be less than significant impacts to biological resources, scenic resources, geological resources, and water resources. BMPs and other measures would be implemented to minimize impacts.

(4) Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community or State.

Construction activities would result in temporary, positive economic activity in the form of construction jobs and material procurements.

During the operational phase, the facility would mostly be operated by the faculty members and students from the UH Hilo Department of Physics and Astronomy. The initial operating budget, exclusive of salaries, would be approximately \$50,000 per year, which would cover software licenses, facility repairs, minor upgrades, preventive maintenance, etc. The modest increase in employment would generate a small increase in direct spending, which in turn would generate further economic activity.

(5) Have a substantial adverse effect on public health.

The Proposed Action would have some temporary, short-term, minor impacts to water resources, air quality, and the existing noise environment; however, these impacts would be minimized through the implementation of BMPs and other measures, as applicable, and would not affect public health.

Due to the remote location of the project site, there would be no impact to emergency vehicle access during construction and any emergency calls could be met by the existing fire, police, and emergency medical services force.

(6) Involve adverse secondary impacts, such as population changes or effects on public facilities.

The Proposed Action would not have growth-inducing effects or changes in the pattern of land use, or related effects on air, water, or other natural systems. The Proposed Action would result in an increase of teaching, training, and research opportunities for Hawai'i students in the field of astronomy. Therefore, secondary impacts from the Proposed Action would be beneficial.

(7) Involve a substantial degradation of environmental quality.

As discussed in **Section 3.0**, no long-term negative impacts are anticipated from implementation of the Proposed Action. All impacts would be short-term and temporary during construction and would be minimized through the implementation of BMPs and other measures.

(8) Is individually limited but cumulatively has a considerable effect upon the environment or involves a commitment for larger actions.

No other actions have occurred or are expected to occur in the future. The impacts associated with the Proposed Action would either be beneficial or short-term and temporary, and there would be no cumulative impacts.

(9) Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat.

Although forest birds, including the Species of Concern 'amakihi, 'apapane, and 'i'iwi, and the endangered palila are known to occur at Halepōhaku, impacts to the species are not expected. The project site is small and not in an area with an abundance shrubs and trees; therefore, it is not prime habitat for forest birds.

The endangered Hawaiian hoary bat is not known to regularly occur within the project area, and no trees would be removed during construction of the Proposed Action. Therefore, impacts to the Hawaiian hoary bat are not expected.

(10) Have a substantial adverse effect on air and water quality or ambient noise levels.

Construction of the Proposed Action would have short-term and temporary impacts to air quality from the generation of dust or particulate matter and exhaust fumes from vehicular travel to and from the project site and from equipment operations during construction activities. Construction activities would include grading and vehicle and equipment engine operations. Because the level of criteria pollutants in Hawai'i are consistently below Federal and State AAQS, and because air pollutants are rapidly dispersed by strong winds, increasing levels of criteria pollutants at the project site from construction activities are not expected to exceed the Federal or State AAQS. The only impacts to air quality during operation of the Proposed Action would be from the generation of dust or particulate matter and exhaust fumes from vehicular travel to and from the project site.

Contaminants associated with equipment during construction may leak and percolate into groundwater or be transported off-site to surface waters. With the implementation of BMPs, impacts to water resources during the short-term construction period would be less than significant.

The use of heavy equipment and small power equipment would be required to construct the facility, which would result in short-term and temporary noise during daylight hours.

(11) Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The Proposed Action is located at the Halepōhaku Mid-Level Support Facility on Maunakea and is not located in an environmentally sensitive area.

(12) Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies.

The Proposed Action would not adversely impact scenic resources. The Proposed Action would introduce a new visual element into the landscape: the 18-foot dome. The dome structure would be adjacent to Dorm A at the Halepōhaku Mid-Level Support Facility and would not be taller than the existing buildings. Therefore, the Proposed Action would not substantially obstruct a vista by placing a structure in the foreground so as to prevent the view, nor would it be incongruous with existing structures currently in the vista or viewplane.

(13) Requires substantial energy consumption or emit substantial greenhouse gases.

Construction of the Proposed Action would result in the short-term and temporary release of greenhouse gases from vehicular and equipment engine operations. Operation of the Proposed Action would not result in the release of greenhouse gases. The telescope would generally be operated remotely from the UH Hilo campus to accommodate students in the classroom; therefore, vehicular travel to the site would be minimal and intermittent and not substantially result in the emission of greenhouse gases.

5.2 Anticipated Finding of No Significant Impact

Based on the significance criteria set forth in HAR Chapter 11-200.1 and discussed in **Section 5.1**, it is anticipated that the Proposed Action would not have a significant effect on the environment and that a Finding of No Significant Impact (FONSI) would be filed with the State of Hawai'i Office of Planning and Sustainable Development's Environmental Review Program following the public comment period.

6.0 Agency and Public Consultation

6.1 Pre-Assessment Consultation

Prior to the preparation of the Draft EA, a pre-assessment consultation letter was sent to Federal, State, and County agencies; elected officials; non-governmental organizations; Native Hawaiian Organizations; and other interested parties. The letter, dated February 8, 2021, provided a summary of the project background, Proposed Action, and community engagement activities, and requested comments on the Proposed Action. Twenty-nine comments were received. A copy of the pre-assessment letter, distribution list, and response letters are provided in **Appendix E**.

6.2 Public Outreach Virtual Engagement

UH Hilo initiated a public outreach campaign in September and October 2020 at the request of the UH Board of Regents for additional community outreach prior to moving ahead with further plans. This outreach was aimed at informing and educating the public about the new educational telescope and UH Hilo's desire to install it at Halepōhaku. Comments were received through an online open house website and documented at the end of the outreach process. MKMB expressed interest in the outreach efforts and received a presentation on the final results during their regular meeting on January 12, 2021.

The primary goal of the outreach effort was to communicate the proposed new telescope's educational and community uses, purpose, size, location, and components to the public and to collect input. Due to the COVID-19 pandemic, face-to-face engagement with stakeholders and the community was not considered due to public health concerns. Consequently, the public outreach effort consisted of 100% virtual engagement tools. These tools included the following:

- **Virtual Open House.** A virtual open house website was developed and launched for a 30-day period during which the public was invited to visit the website to learn more about the proposed new educational telescope and the proposed site and to leave comments.
- **Informational and Promotional Materials.** The project team developed informational material to be used and shared publicly via the open house website, through direct emails and press releases, and at stakeholder meetings.
- **Stakeholder Meetings.** Stakeholders from community organizations, civic clubs, educational institutes, and other relevant organizations were invited to attend a virtual meeting via the Zoom web conferencing platform to learn about the proposed project.

The majority of the community feedback content was received through the virtual open house comment form submissions. A total of 355 individual comments were submitted.

The community outreach objectives, activities, results, and all comments received are documented in the *New Educational Telescope Community Outreach Final Report* included with this Draft EA as **Appendix F**.

This page intentionally blank.

7.0 References

- County of Hawai'i Department of Research and Development (COH-DPR). 2015. *Hawai'i County Data Book, 2015*. A Partnership Program of the University of Hawai'i at Hilo through a Cooperative Agreement with the U.S. Small Business Administration. Available online at: <http://records.hawaiicounty.gov/weblink/1/edoc/78458/2015-HawaiiCtyDataBook.pdf>.
- De Silva, K. and M. de Silva. 2007. *E Ho'ka Nani I Mana. Ka'iwakiloumoku-Hawaiian Cultural Center, University of Hawaii at Manoa, Honolulu*. August 2, 2007. Available online at: <http://hccp.ksbe.edu/kaleinamanu/8-ehoikanani.php>.
- Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger. 2014. *Evapotranspiration of Hawai'i*. Final Report submitted to the U.S. Army Corps of Engineers – Honolulu District and the Commission on Water Resource Management, State of Hawai'i.
- Ku'iwalu. 2009. *Mauna Kea Comprehensive Management Plan, UH Management Areas*. Prepared for University of Hawai'i. April 2009. Available online at: http://www.malamamaunakea.org/uploads/management/plans/CMP_2009.PDF.
- Maly, K. and O. Maly. 2005. *Mauna Kea—Ka Piko Kaulana o Ka 'Aina (Mauna Kea—The Famous Summit of the Land: A Collection of Native Traditions, Historical Accounts, and Oral History Interviews for: Mauna Kea, the Lands of Ka'ohē, Humu'ula and the 'Aina Mauna on the Island of Hawai'i)*. Prepared for the Office of Mauna Kea Management. Kumu Pono Associates LLC. Hilo.
- Mauna Kea Forest Restoration Project (MKFRP). 2021. *Restore Mauna Kea, Threats: Drought*. Available online at: <https://dlnr.hawaii.gov/restoremaunakea/threats/drought-2/>.
- McCoy, P. 1984. *Mauna Kea Summit Region Survey: A Summary of the 1984 Fieldwork*. Ms. on file at the Department of Anthropology, Bishop Museum.
- Natural Resources Conservation Service (NRCS). 2020. *Web Soil Survey, National Cooperative Soil Survey, Island of Hawai'i*. Version 13, June 8, 2020. Available online at: <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.
- Pacific Consulting Services, Inc. (PCSI). 2009. *A Cultural Resources Management Plan for the University of Hawai'i Management Areas on Mauna Kea, Ka'ohē Ahupua'a, Hāmākua District, Hawai'i Island, State of Hawai'i*. Prepared for Office of Mauna Kea Management. October 2009. Available online at: http://www.malamamaunakea.org/uploads/management/plans/CMP_CRMP_2009.pdf.
- Sustainable Resources Group International, Inc. (SRGI). 2009. *Natural Resources Management Plan for the UH Management Areas on Mauna Kea*. Prepared for Office of Mauna Kea Management.

- September 2009. Available online at:
http://www.malamamaunakea.org/uploads/management/plans/CMP_NRMP_2009.pdf.
- SRGI, Island Planning, and Island Transitions, LLC. 2010. *Public Access Plan for the UH Management Areas on Mauna Kea*. Prepared for Office of Mauna Kea Management. January 2010. Available online at:
http://www.malamamaunakea.org/uploads/management/plans/CMP_PublicAccessPlan_2010.pdf.
- Stever, H. 2016. *Arthropod Diversity Estimates for Three Native Subalpine Plant Species on the Maunakea Volcano of Hawai'i Island*. Master's Thesis. University of Hawai'i at Hilo. December 2016. Available online at:
https://dspace.lib.hawaii.edu/bitstream/10790/2949/1/Stever_hilo.hawaii_14180_10132.pdf.
- University of Hawai'i Economic Research Organization (UHERO). 2014. *The Economic Impact of Astronomy in Hawai'i*. August 28, 2014. Available online at: https://uhero.hawaii.edu/wp-content/uploads/2019/08/UHERO_Astronomy_Final.pdf.
- U.S. Fish and Wildlife Service (USFWS). 2006. *Revised Recovery Plan for Hawaiian Forest Birds, Volume II. Region 1*, Portland, OR. Available online at:
<https://www.fws.gov/pacific/ecoservices/endangered/recovery/documents/HawaiianForestBirdsRevRP2006PartII.pdf>.
- Wentworth, C.K. and W.E. Powers. 1941. Multiple Glaciation of Mauna Kea, Hawai'i. *Bulletin of the Geological Society of America*. 52:1193-1216.
- Western Regional Climate Center (WRCC). 2016. Halepohaku 111, Hawaii (511065) Monthly Climate Summary. Period of Record 10/01/1949 to 04/30/2016. Available online at:
<https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?hi1065>.

Appendix A

Pre-Final Drawings

This page intentionally left blank.

UNIVERSITY OF HAWAI`I at HILO

HILO, HAWAI`I

New Educational Telescope

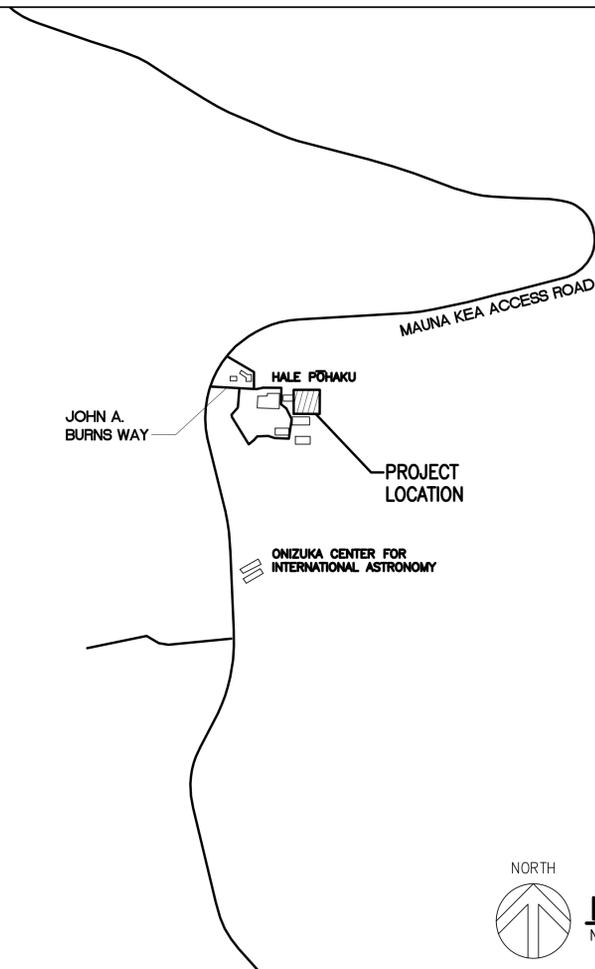
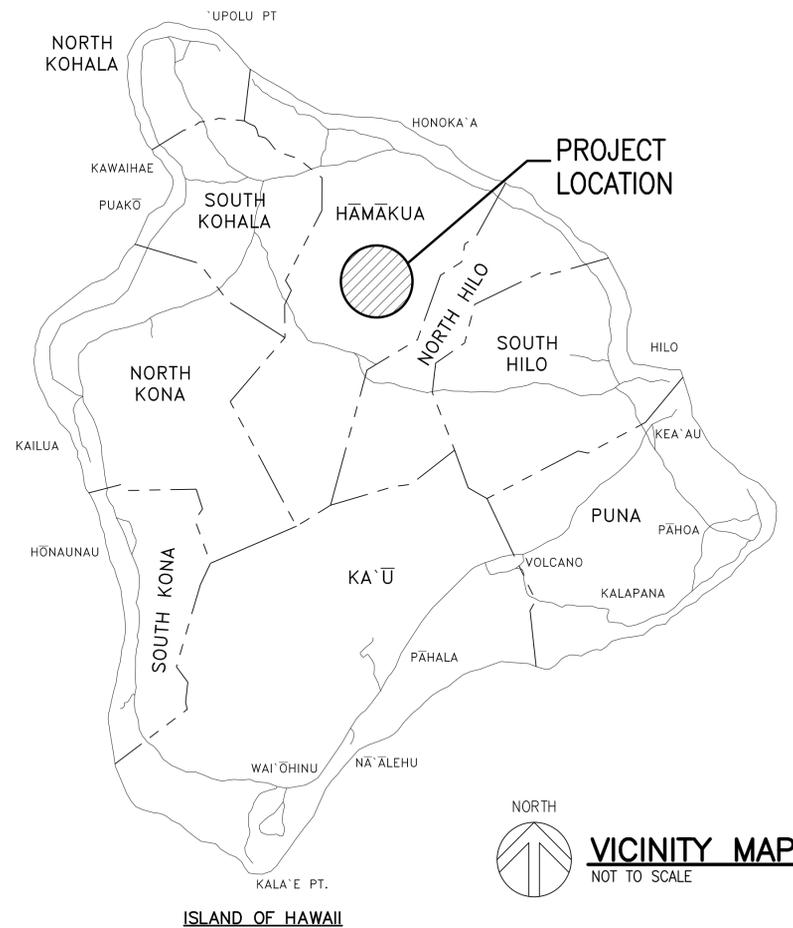
PROJECT NO. UHH-16061

TMK: (3) 4-4-015:012

OWNER:
STATE OF HAWAI`I



FILE NAME: C:\CIVIL 3D PROJECTS\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\01 CE DWG\1-1 TITLE SHEET.DWG BY: ELUMBANG



PREPARED BY:

PROJECT MANAGER/CIVIL ENGINEER/
STRUCTURAL ENGINEER

SSFM INTERNATIONAL, INC.
99 AUPUNI STREET, SUITE 202
HILO, HI 96720

ELECTRICAL ENGINEER/
MECHANICAL ENGINEER/SURVEYOR

ENGINEERING PARTNERS, INC.
455 E. LANIKAULA STREET
HILO, HI 96720

APPROVED BY:

UNIVERSITY OF HAWAI`I
KALEI RAPOZA, VICE CHANCELLOR OF
ADMINISTRATIVE AFFAIRS

DATE

PRE FINAL DESIGN - NOT FOR CONSTRUCTION

SHEET SIZE: 24" X 36" FILE NAME: W:\1_CIVIL_3D_PROJECTS\2020_037_000_UHH_HALEPOHAKU_EDUCATIONAL_TELESCOPE\01_GEN NOTES.DWG BY: ELUMBANG

INDEX OF DRAWINGS	
SHEET NO	SHEET TITLE
T-1	TITLE SHEET
C-0.1	GENERAL NOTES 1
C-0.2	GENERAL NOTES 2
C-1.0	EXISTING CONDITION, DEMOLITION AND EROSION CONTROL PLAN
C-2.0	OVERALL SITE AND GRADING PLAN
C-2.1	SITE AND GRADING PLAN
C-3.0	SECTIONS
C-4.0	DETAILS
C-4.1	DETAILS
S-0.0	GENERAL NOTES
S-1.0	FOUNDATION, PLATFORM FRAMING PLAN
S-2.0	ELEVATIONS
S-3.0	SECTION AND DETAILS
M-0.1	MECHANICAL SYMBOLS, IECC, & ABBREVIATIONS
M-0.2	MECHANICAL SCHEDULES AND DETAILS
M-1.1	PARTIAL AIR CONDITIONING AND VENTILATION PLAN
E-0.1	ELECTRICAL SYMBOLS, IECC, AND ABBREVIATIONS
E-1.1	OVERALL ELECTRICAL PLAN
E-1.2	ELECTRICAL SCHEDULES & SINGLE LINE DIAGRAM

GENERAL CONSTRUCTION NOTES:

- THE SCOPE OF WORK OF THIS PROJECT INCLUDES, BUT IS NOT LIMITED TO INSTALLATION OF DOME, ELEVATED WALKWAY, DECK, HANDRAIL, BOLLARDS AND DOUBLE SWING GATES BEFORE AND AFTER DORM A.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PROPOSAL, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED BY DPW, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI AND HAWAII, HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005 EDITION, AND STANDARD PLANS OF THE STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION, DATED 2008, UNLESS OTHERWISE SPECIFIED ON THE PLANS OR SPECIFICATIONS.
- NO WORK SHALL BE PERFORMED ON SATURDAYS, SUNDAYS AND HOLIDAYS ANYTIME WITHOUT PRIOR APPROVAL FROM THE OWNER. WORK DURING NORMAL WORKING HOURS SHALL BE BETWEEN 7:45 A.M. TO 4:30 P.M. OR AS DIRECTED BY THE OWNER.
- THE CONTRACTOR, AT ITS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL RULES OF THE STATE DEPARTMENT OF HEALTH, HAR 11-60.1, FUGITIVE DUST.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN, FROM THE APPROPRIATE COUNTY AND STATE AGENCIES, ALL PERMITS REQUIRED TO COMPLETE THE WORK SHOWN ON THESE PLANS INCLUDING, BUT NOT LIMITED TO, ALL DEMOLITION, CLEARING AND GRUBBING, GRADING, AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR AGREES THAT IT SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OR WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
- NO BLASTING SHALL BE ALLOWED ON THIS PROJECT.
- THE CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS AND/OR SPECIFICATIONS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.
- THE CONTRACTOR SHALL MAINTAIN VEHICULAR AND PEDESTRIAN ACCESS TO EXISTING FACILITIES AT ALL TIMES AND SHALL SCHEDULE AND PROSECUTE ITS WORK IN SUCH A MANNER TO AVOID INTERRUPTION OF NORMAL ACTIVITIES AT THE EXISTING FACILITIES. THE CONTRACTOR SHALL PROVIDE EARLY NOTIFICATION AND OBTAIN APPROVAL FOR ANY ANTICIPATED INTERRUPTIONS. TEMPORARY SAFE PEDESTRIAN PASSAGEWAYS AROUND OR THROUGH A CONSTRUCTION SITE SHALL COMPLY WITH ADAAG SECTIONS 206.1 AND 402.1.
- THE CONTRACTOR SHALL MAINTAIN A MINIMUM 36-INCH WIDE ACCESSIBLE ROUTE TO BUILDING ENTRY, UNOBSTRUCTED BY SIGNS, POLES ETC.
- THE CONTRACTOR SHALL CONTACT HAWAII ONE CALL CENTER AT (866) 423-7287 OR 811 AT LEAST FIVE (5) DAYS PRIOR TO START OF WORK TO HAVE RESPECTIVE UTILITY COMPANIES LOCATE AND MARK WHERE THEIR UNDERGROUND FACILITIES ARE LOCATED. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL WORK WITH AGENCIES AND UTILITY COMPANIES. ALL UTILITY WORK WITH UNDERGROUND INSTALLATIONS MUST BE COMPLETED PRIOR TO PAVING WORK BEING DONE ABOVE THEM.
- THE EXISTENCE AND LOCATION OF OVERHEAD AND UNDERGROUND UTILITIES, MANHOLES, MONUMENTS AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA, BUT THE ACCURACY IS NOT GUARANTEED. THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF WORK IS POSSIBLE. THE CONTRACTOR SHALL TONE FOR THE EXACT LOCATIONS AND DEPTHS OF ALL UNDERGROUND FACILITIES, EITHER SHOWN ON OR OMITTED FROM THE PLANS, IN AREAS WHERE WORK, SUCH AS THE PLACEMENT OF NEW UNDERGROUND OR ABOVEGROUND UTILITY AND INFRASTRUCTURE, SIGN POSTS, ETC. MAY AFFECT THESE PROPERTIES. TONING SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CONTRACT ITEMS AND WILL NOT BE PAID FOR SEPARATELY.
- THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND FACILITIES AND SHALL MAINTAIN ADEQUATE CLEARANCE WHEN OPERATING EQUIPMENT WITHIN OR UNDER OVERHEAD FACILITIES. THE CONTRACTOR SHALL BE HELD LIABLE FOR ANY DAMAGES INCURRED TO THE EXISTING FACILITIES AND/OR IMPROVEMENTS AS A RESULT OF ITS OPERATIONS. ANY DAMAGE INFLICTED ON EXISTING UTILITY LINES RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED OR RESTORED AS DIRECTED BY THE OWNER AND/OR ENGINEER AND APPROVED BY THE UTILITY AT THE CONTRACTOR'S EXPENSE.
- WHEN TRENCH EXCAVATION IS ADJACENT TO OR UNDER EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS, AND SETTLEMENT, AND FOR PROPERLY SUPPORTING EXISTING STRUCTURES AND FACILITIES WITH BEAMS, STRUTS, OR UNDERPINNING TO FULLY PROTECT IT FROM DAMAGE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO VARIOUS CONTRACT ITEMS.
- WHEN EXCAVATING NEAR UTILITY POLES, THE CONTRACTOR SHALL PROTECT, SUPPORT, SECURE AND TAKE ALL OTHER PRECAUTIONS TO PREVENT DAMAGE TO OR LEANING OF THESE POLES. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED TO REPAIR AND/OR STRAIGHTEN THESE POLES.
- WHENEVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS, DEPTHS AND ASSURE THAT CONNECTIONS CAN BE MADE PRIOR TO EXCAVATION FOR THE NEW LINES AT NO COST TO THE OWNER. THE DEPTHS OF THE EXISTING UTILITIES MAY BE SHALLOW. ANY NECESSARY ADJUSTMENTS FOR THE NEW LINES TO ENSURE PROPER CONNECTION TO THE EXISTING, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. HELCO/HTC/CABLE LINES ARE EITHER DIRECT BURY OR CONCRETE JACKETED.
- EXISTING UTILITIES SHALL REMAIN IN SERVICE DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF WORK WITHIN THE SCOPE, AND WORK DONE BY OTHERS.
- THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING VALVE BOXES, UTILITY MANHOLES, DRAINAGE GRATINGS, CENTERLINE MONUMENTS, ETC. AND SHALL HAVE THEM RAISED TO MEET THE NEW PAVEMENT GRADE.
- ALL CONSTRUCTION LINES, GRADES AND SURVEY MONUMENT STAKEOUTS SHALL BE MADE BY LICENSED SURVEYORS.
- THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION OR BETTER, ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE CONSTRUCTION INCLUDING BUT NOT LIMITED TO, PAVEMENTS, PAVEMENT MARKINGS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS OTHERWISE NOTED IN THE PLANS. DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL.
- WORK INCIDENTAL TO THE CONTRACT AND NECESSARY TO COMPLETE THE PROJECT, ALTHOUGH NOT SPECIFICALLY REFERRED TO ON THE CONTRACT DOCUMENT, SHALL BE FURNISHED AND PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

- THE CONTRACTOR SHALL CONDUCT ALL TESTS AS REQUIRED BY THE CONTRACT OR AS REQUIRED BY THE ENGINEER AND BE RESPONSIBLE FOR ALL EXPENSES INCURRED IN CONDUCTING THESE TESTS.
- INSPECTIONS ARE PERFORMED FOR THE EXCLUSIVE BENEFIT OF THE OWNER. THE INSPECTION OF OR THE FAILURE TO INSPECT THE WORK SHALL NOT RELIEVE THE CONTRACTOR OF OBLIGATIONS TO FULFILL THE CONTRACT AS PRESCRIBED, TO CORRECT DEFECTIVE WORK, AND TO REPLACE UNSUITABLE OR REJECTED MATERIALS REGARDLESS OF WHETHER PAYMENT FOR SUCH WORK HAS BEEN MADE.
- FAILURE OF AN INSPECTOR AT ANY TIME TO REJECT NON-CONFORMING WORK SHALL NOT BE CONSIDERED A WAIVER OF THE OWNER'S RIGHT TO REQUIRE WORK IN STRICT CONFORMITY WITH THE CONTRACT DOCUMENTS AS A CONDITION OF FINAL ACCEPTANCE.
- EXISTING TOPOGRAPHIC SURVEY WAS CONDUCTED ON OCTOBER 2020 BY ENGINEERING PARTNERS, INC. UNDERGROUND UTILITIES SHOWN ARE FOR INFORMATION ONLY. NO GUARANTEE IS MADE ON THE ACCURACY AND COMPLETENESS OF THE INFORMATION. THE CONTRACTOR MUST VERIFY THE INFORMATION SHOWN IS ACCURATE PRIOR TO CONSTRUCTION.
- FOR BENCHMARKS, SEE SHEETS C-1.0 AND C-2.0.

REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
New Educational Telescope				
University of Hawaii at Hilo				
GENERAL NOTES 1				
SSFMI INTERNATIONAL, INC.				
DESIGNED BY: RRM	CHECKED BY:	PROJECT NO. UHH-16061	SHEET C-01	
DRAWN BY: CA	APPROVED BY:	DATE NOV. 2021	OF 19 SHTS	
SCALE: AS NOTED				

GRADING NOTES:

- ALL WORK SHALL CONFORM TO CHAPTER 10 OF THE HAWAII COUNTY CODE. SHOULD A GRADING PERMIT BE REQUIRED, NO WORK SHALL COMMENCE UNTIL THE DEPARTMENT OF PUBLIC WORKS (DPW) APPROVES A GRADING PERMIT.
- THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS RESULTING FROM ITS WORK. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE OWNER SHALL BE PAYABLE BY THE CONTRACTOR.
- THE CONTRACTOR, AT ITS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL RULES OF THE STATE DEPARTMENT OF HEALTH, HAR 11-60.1, FUGITIVE DUST.
- ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 55, WATER POLLUTION CONTROL AND CHAPTER 54, WATER QUALITY STANDARDS, AND TO THE EROSION AND SEDIMENTATION CONTROL STANDARDS AND GUIDELINES OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII.
- FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
- THE CONTRACTOR SHALL INFORM THE DPW OF THE LOCATION OF THE DISPOSAL AND/OR BORROW SITE(S) REQUIRED FOR THIS PROJECT WHEN AN APPLICATION FOR A GRADING PERMIT IS MADE. THE DISPOSAL AND/OR BORROW SITE(S) MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE. DISPOSAL AND/OR BORROW SITES SHALL BE MKSS STOCKPILES UNLESS OTHERWISE APPROVED BY THE OWNER.
- NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS ANYTIME WITHOUT PRIOR APPROVAL FROM THE DPW. GRADING WORK ON NORMAL WORKING HOURS SHALL BE BETWEEN 7:45 A.M. TO 3:30 P.M. OR AS DIRECTED BY THE OWNER.
- FILLS SHALL BE COMPACTED TO 90 PERCENT (90%) OF MAXIMUM DENSITY PER ASTM D-1557 TEST.
- THE CONTRACTOR SHALL REMOVE ALL VEGETATION BEFORE PLACING FILLS ON NATURAL GROUND SURFACE.
- ALL GRADING AND SUBGRADE PREPARATION SHALL BE AS RECOMMENDED IN GEOTECH REPORT

EROSION CONTROL AND BEST MANAGEMENT PRACTICES (BMPs) NOTES:

- CONTRACTOR TO CONFORM TO THE EROSION AND SEDIMENTATION CONTROL STANDARDS AND GUIDELINES ESTABLISHED BY THE DEPARTMENT OF PUBLIC WORKS IN CONFORMITY WITH CHAPTER 180C, HAWAII REVISED STATUTES.
- MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY CLEARING AND GRUBBING WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
- CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF CLEARED SURFACE AREA.
- ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY.
- CONSTRUCT FACILITIES TO RETAIN ON-SITE WASTEWATER SUCH AS WATER FOR DUST CONTROL AND CONSTRUCTION EXIT WASH WATER AND PERCOLATE INTO THE SOIL. WASH WATER AFTER CLEANING CONCRETE TRUCKS SHALL BE CONTAINED IN A SEPARATE WASH AREA LINED WITH AN IMPERMEABLE LAYER AND NOT ALLOWED TO OVERFLOW. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND SIZE OF WASH AREA.
- PROVIDE CONSTRUCTION ENTRANCE FOR EACH INGRESS AND EGRESS.
- MAINTAIN SEDIMENT TRAPS AT DISCHARGE POINTS DURING SITE WORK AND UNTIL PERMANENT EROSION CONTROLS ARE IN PLACE.
- INSTALL SEDIMENT BASIN ON A WEEKLY BASIS. REMOVE SEDIMENT AND DEBRIS AS DIRECTED BY THE ENGINEER.
- PRE-CONSTRUCTION GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN TWENTY (20) CALENDAR DAYS PRIOR TO SITE DISTURBANCE.
- TEMPORARY SOIL STABILIZATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY (30) CALENDAR DAYS, IF NEEDED OR REQUIRED BY THE DIRECTOR OF PUBLIC WORKS.
- PERMANENT SOIL STABILIZATION WITH NATIVE MATERIAL SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING AND GRUBBING.
- STORM WATER FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED BY USING APPROPRIATE CONTROL MEASURES AS PRACTICAL.
- EROSION CONTROL MEASURES SHOWN HEREON REPRESENT THE MINIMUM REQUIREMENTS. CONTRACTOR SHALL ADJUST EROSION CONTROL MEASURES TO PROVIDE BEST MANAGEMENT PRACTICES TO ADDRESS REQUIREMENTS OF HAR 11-54 AS NEEDED AND AS CONSTRUCTION PHASING AND SEQUENCING REQUIRES. ANY REVISIONS AND/OR CHANGES AS A RESULT OF THESE CONDITIONS SHALL REQUIRE REVIEW AND APPROVAL BY THE CONSTRUCTION MANAGER, STATE AND COUNTY AGENCIES.
- THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY BMP MEASURES UNTIL THE ENTIRE AREA IS COMPLETELY STABILIZED. ALL BMP MEASURES SHALL BE REMOVED IMMEDIATELY, AFTER THE AREA IS COMPLETELY STABILIZED.
- INSPECT BMPs AND SITE WEEKLY. MAINTAIN BMPs AND SITE AS REQUIRED TO ENSURE CONTINUED PERFORMANCE.

DEMOLITION NOTES:

- ALL EXISTING FENCES, GUARDRAILS, AC CURBS AND OTHER SAFETY DEVICES SUCH AS SIGNS, SIGNALS, AND DELINEATORS SHALL REMAIN IN PLACE AND REMAIN EFFECTIVE FOR AS LONG AS POSSIBLE BEFORE REMOVAL BECOMES NECESSARY.
- ALL DRIVEWAYS SHALL REMAIN ACCESSIBLE. ANY DISRUPTION DUE TO DRIVEWAY WORK SHALL BE COORDINATED WITH OWNERS.
- PROTECT EXISTING UTILITIES, ESPECIALLY WHERE AC PAVEMENT STRUCTURE IS BEING REMOVED TO NEW PAVEMENT SUBGRADE (INCIDENTAL).
- ALL REMOVAL WORK SHALL INCLUDE DISPOSAL OFF-SITE OR DELIVERY OF RECYCLABLE MATERIALS TO THE APPROPRIATE RECYCLING FACILITY BY THE CONTRACTOR IN ACCORDANCE WITH ALL APPROPRIATE REGULATIONS. DISPOSAL SHALL BE CONSIDERED INCIDENTAL TO REMOVAL COSTS AND SHALL NOT BE PAID FOR SEPARATELY.
- PAYMENT FOR CLEARING AND GRUBBING IS INCIDENTAL TO THE WORK AND SHALL NOT BE PAID FOR SEPARATELY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXISTING DRAINAGE PATTERNS DURING CONSTRUCTION.
- ANY ELECTRICAL SERVICE TO THE BUILDING TO BE DEMOLISHED SHALL BE DISCONNECTED FROM ITS SOURCE AND ASSOCIATED WIRING BETWEEN SOURCE AND BUILDING SHALL BE REMOVED.

SOLID WASTE CONSTRUCTION NOTES:

- UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER HANDLING, STORAGE AND/OR DISPOSAL OF ALL WASTE GENERATED BY THIS CONSTRUCTION INCLUDING GRUBBING AND EXCESS EXCAVATED MATERIAL. ANY MATERIAL BROUGHT TO THE COUNTY LANDFILLS WILL BE SUBJECT TO THE INSTITUTED TIPPING FEE SYSTEM, WITH NO EXCEPTIONS OR EXEMPTIONS.
- ALL WASTES GENERATED BY CONSTRUCTION, INCLUDING GRUBBING, DEMOLITION AND EXCESS EXCAVATION MATERIAL MAY BE BROUGHT TO THE WEST HAWAII SANITARY LANDFILL. THE CONTRACTOR SHALL VERIFY CURRENT LANDFILL FEE WITH THE COUNTY OF HAWAII SOLID WASTE DIVISION. THE NECESSARY LANDFILL FEE SHALL BE INCLUDED IN THE CONTRACTOR'S BID SUM.
- CONSTRUCTION, DEMOLITION AND GRUBBING MATERIAL SHALL NOT BE DEPOSITED AT ANY OF THE COUNTY TRANSFER STATIONS BUT SHALL BE TRANSPORTED FOR DISPOSAL TO THE WEST HAWAII SANITARY LANDFILL.
- CHIP GRUBBED MATERIAL BEFORE BRINGING TO THE COUNTY LANDFILL IN ACCORDANCE WITH REGULATIONS OF THE SOLID WASTE DIVISION, DEM.

TOPOGRAPHIC SURVEY NOTES:

- ELEVATIONS ARE BASED ON "HALE POHAKU". ELEV. 9277.58 FEET AS SHOWN ON TOPOGRAPHIC SURVEY MAP PREPARED BY IMATA AND ASSOCIATES, INC, DATED 6-26-2015, AND BEING REFERRED TO CONSTRUCTION PLAN TITLED "MAUNA KEA OBSERVATORY ACCESS ROAD IMPROVEMENTS".
- THIS IS NOT A BOUNDARY SURVEY, AZIMUTH AND DISTANCED SHOWN ON BOUNDARY LINES FROM HAWAII COUNTY PLANNING DEPT. SUB-5531, WITH AZIMUTHS BEING MEASURED CLOCKWISE FROM TRUE SOUTH AND REFERRED TO GOVERNMENT SURVEY STATION "OMAOKOPII".
- CONTROL POINT AZIMUTH AND DISTANCES ARE FROM A TOPOGRAPHIC FIELD SURVEY MADE ON THE GROUND SEPTEMBER 9, 2020 USING A FOCUS 30 3" ROBOTIC TOTAL STATION SN 87100267.

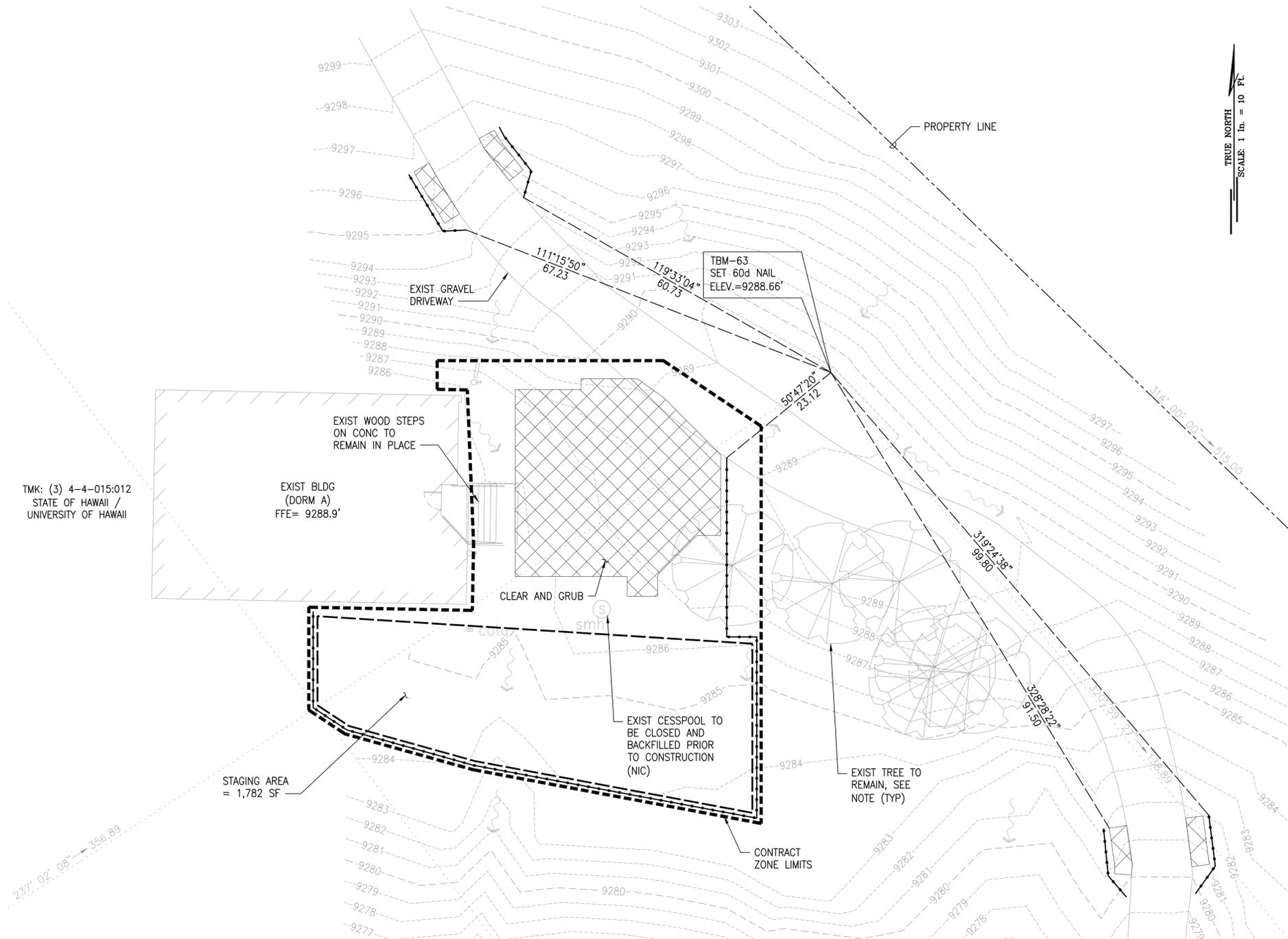
ABBREVIATIONS:

ALUM	ALUMINUM	OC	ON CENTER
APPROX	APPROXIMATELY	OD	OUTER DIAMETER
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS		
BMPs	BEST MANAGEMENT PRACTICES	R/W	RIGHT-OF-WAY
BLDG	BUILDING	REQ'D	REQUIRED
℄	CENTERLINE	SHT	SHEET
CLR	CLEAR	SMH	SEWER MANHOLE
CONC	CONCRETE	SPEC	SPECIFICATIONS
COND	CONDENSATE	SQ	SQUARE
COTG	CLEAN OUT TO GRADE	STD	STANDARD
		STRL	STUCTURAL
DET	DETAIL	THK	THICK
DIA	DIAMETER	TMK	TAX MAP KEY
DPW	DEPARTMENT OF PUBLIC WORKS	TYP	TYPICAL
DWG	DRAWING		
		VERT	VERTICAL
E	EAST		
ELEC	ELECTRICAL	W/	WITH
ELEV	ELEVATION	W/O	WITHOUT
EP	EDGE OF PAVEMENT		
EXIST	EXISTING		
FFE	FINISH FLOOR ELEVATION		
FT	FEET		
FTG	FOOTING		
GA	GAUGE		
GALV	GALVANIZED		
IN	INCH		
MAX	MAXIMUM		
MECH	MECHANICAL		
MIN	MINIMUM		
N	NORTH		
ND	NOMINAL DIAMETER		
NIC	NOT IN CONTRACT		

SHEET SIZE: 24" X 36" FILE NAME: C:\CIVIL 3D PROJECTS\2020_037_000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\01 CE DWG\IC-01_02 GEN NOTES.DWG BY: JAGUILAR

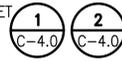
REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
		UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII		
		New Educational Telescope		
		University of Hawaii at Hilo		
		GENERAL NOTES 2		
		SSFm INTERNATIONAL, INC.		
		DESIGNED BY: RRM	CHECKED BY:	PROJECT NO. UHH-16061
		DRAWN BY: CA	APPROVED BY:	SHEET C-0.2
		SCALE: AS NOTED	DATE NOV. 2021	OF 19 SHTS

SHEET SIZE: 24" X 36" FILE NAME: C:\CIVIL 3D PROJECTS\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\01 CE DWG\C-10 EXCON DEMO EC.DWG BY: ELUMBANG

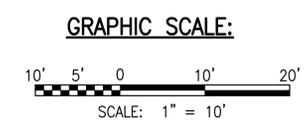


NOTE:
ALL EXISTING TREES ARE TO REMAIN AND TO BE PROTECTED IN PLACE.

- LEGEND:**
- 9295 --- EXIST MAJOR CONTOUR
 - 9294 --- EXIST MINOR CONTOUR
 - ~> EXIST SURFACE RUNOFF DIRECTION
 - SILT FENCE OR FILTER SOCK, SEE DET
 - PROPERTY LINE

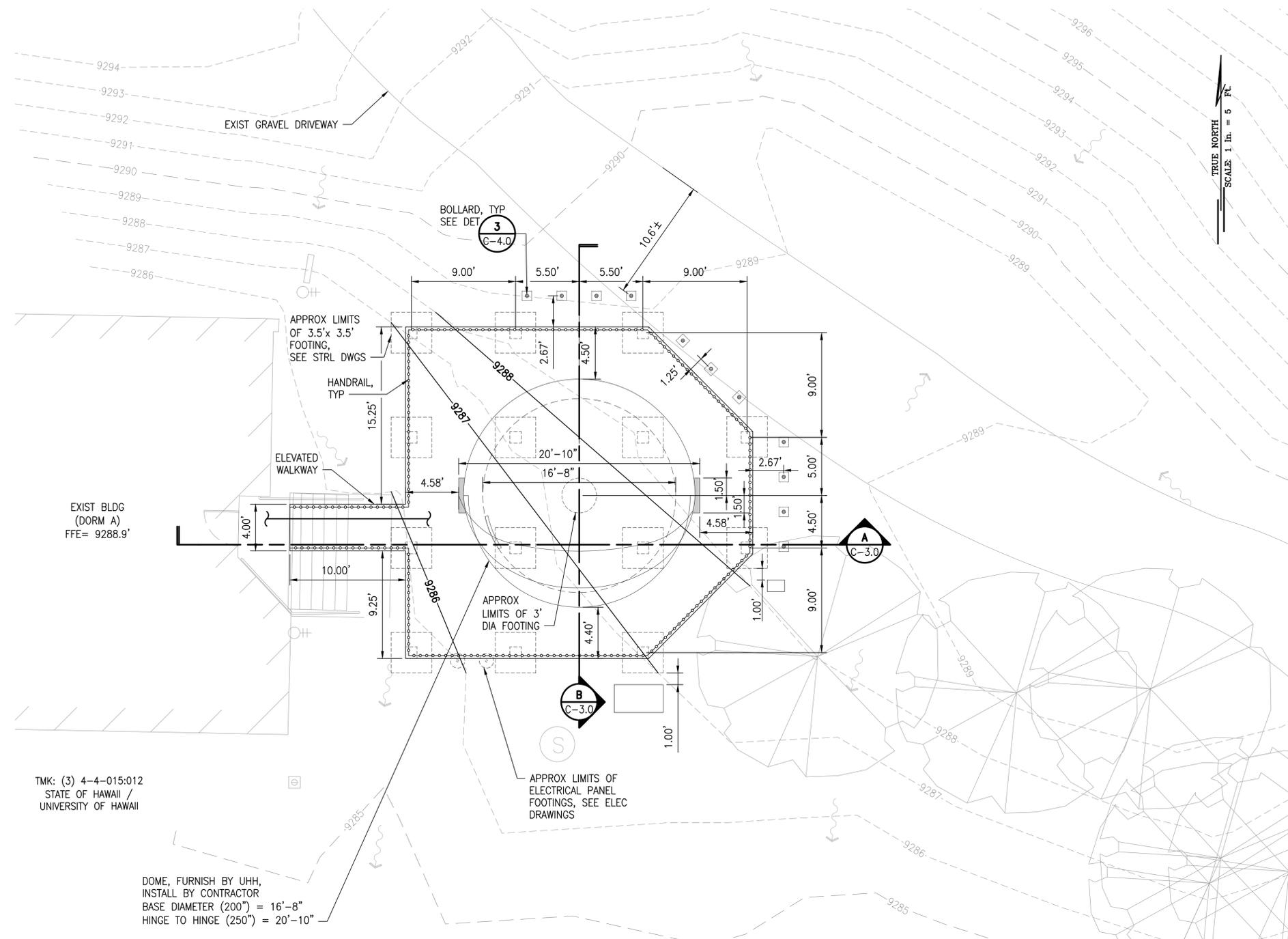


PLAN
SCALE: 1" = 10'



REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
New Educational Telescope				
University of Hawaii at Hilo				
EXISTING CONDITION, DEMOLITION AND EROSION CONTROL PLAN				
SSFM INTERNATIONAL, INC.				
DESIGNED BY: RRM	CHECKED BY:	PROJECT NO. UHH-16061	SHEET C-10	
DRAWN BY: CA	APPROVED BY:	DATE NOV. 2021	OF 19 SHTS	
SCALE: AS NOTED				

SHEET SIZE: 24" X 36" FILE NAME: W:\CIVIL 3D PROJECTS\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\01 CE DWG\C-21 SITE AND GRADING PLAN.DWG BY: RITO



LEGEND:

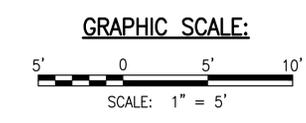
-----○-----	HANDRAIL
•	BOLLARD
~~~~~>	EXISTING SURFACE RUNOFF DIRECTION
-----	9295 EXST MAJOR CONTOUR
-----	9294 EXST MINOR CONTOUR
-----	9295 PROPOSED MAJOR CONTOUR
-----	9294 PROPOSED MINOR CONTOUR

EXIST BLDG (DORM A)  
FFE= 9288.9'

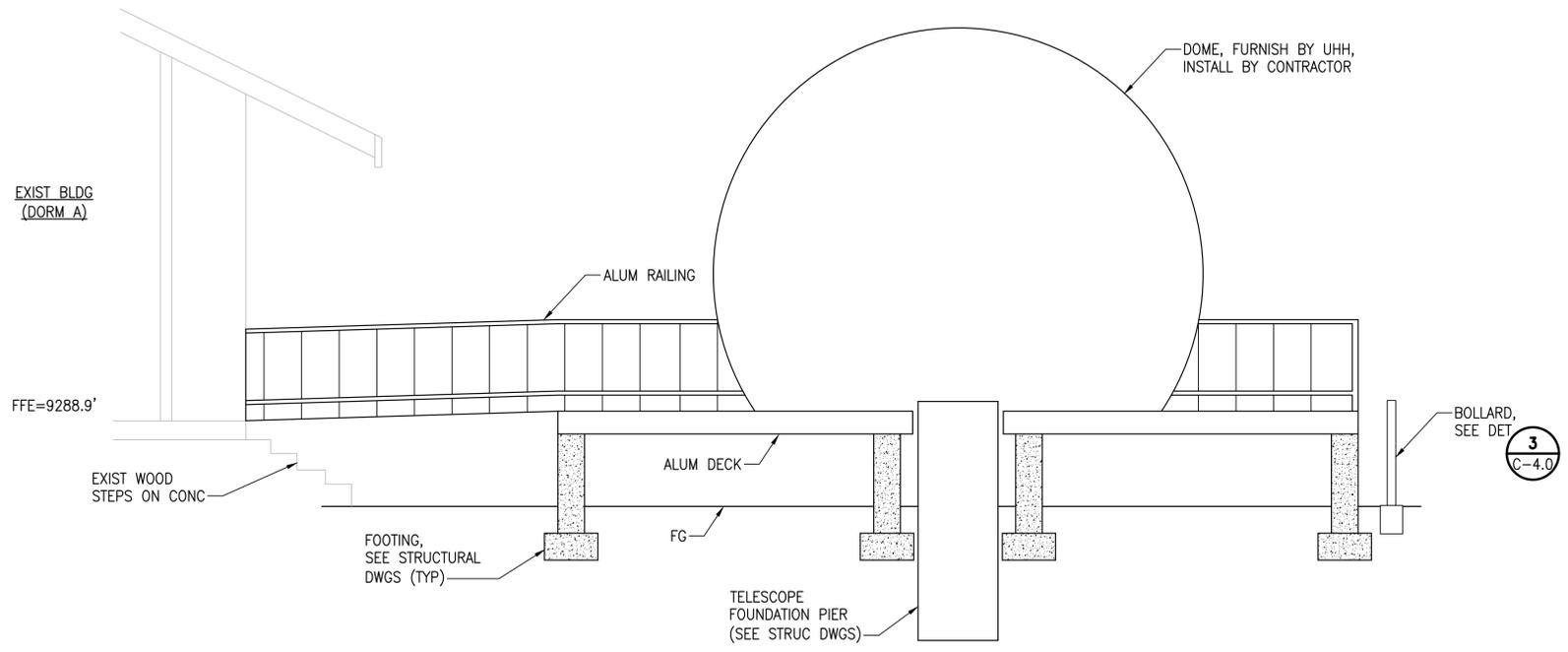
TMK: (3) 4-4-015:012  
STATE OF HAWAII /  
UNIVERSITY OF HAWAII

DOME, FURNISH BY UHH,  
INSTALL BY CONTRACTOR  
BASE DIAMETER (200") = 16'-8"  
HINGE TO HINGE (250") = 20'-10"

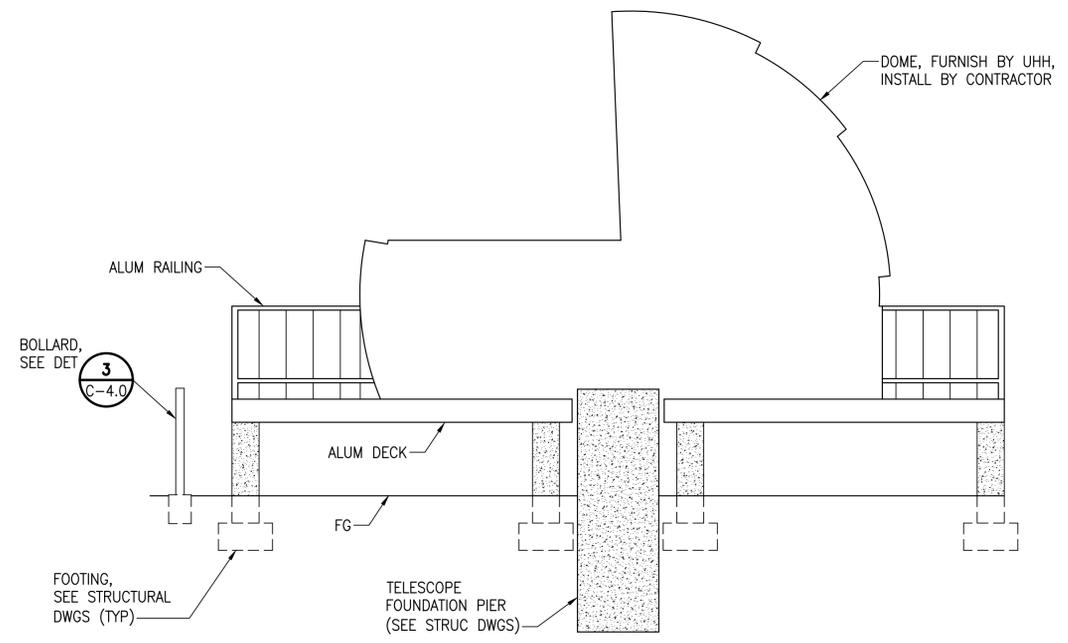
**PLAN**  
SCALE: 1" = 5'



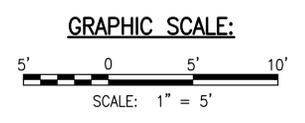
REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
<b>New Educational Telescope</b> University of Hawaii at Hilo				
<b>SITE AND GRADING PLAN</b>				
SSFM INTERNATIONAL, INC.				
DESIGNED BY: RRM	CHECKED BY:	PROJECT NO. UHH-16061	SHEET <b>C-21</b>	
DRAWN BY: CA	APPROVED BY:	DATE NOV. 2021	OF 19 SHTS	
SCALE: AS NOTED				



**A SECTION A**  
C-3.0 SCALE: 1" = 5'



**B SECTION B**  
C-3.0 SCALE: 1" = 5'



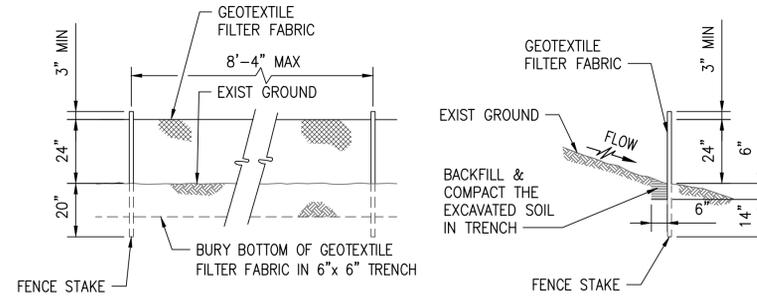
SHEET SIZE: 24" X 36" FILE NAME: C:\CIVIL 3D PROJECTS\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\01 CE DWG\C-30 SECTIONS.DWG BY: ELUMBANG

REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
New Educational Telescope University of Hawaii at Hilo				
SECTIONS				
SSFM INTERNATIONAL, INC.				
DESIGNED BY: RRM	CHECKED BY:	PROJECT NO. UHH-16061	SHEET <b>C-30</b>	
DRAWN BY: CA	APPROVED BY:	DATE NOV. 2021	OF 19 SHTS	
SCALE: AS NOTED				

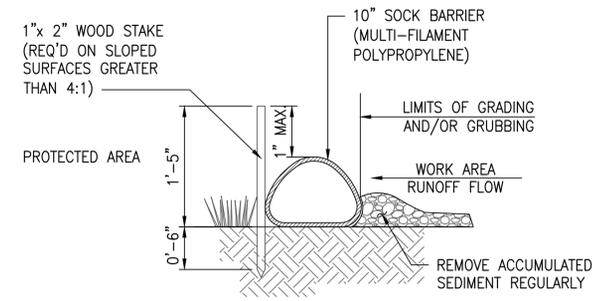
SHEET SIZE: 24" X 36" FILE NAME: C:\CIVIL 3D PROJECTS\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\01 CE DWG\C-40 DETAILS.DWG BY: J.MORALES

**NOTES:**

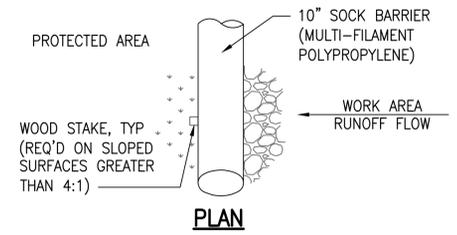
1. THE FILTER FABRIC SHALL BE A MINIMUM OF 36 INCHES WIDE.
2. IF SILT FENCE IS OBTAINED FROM MANUFACTURER AS A PACKAGE (IE FABRIC ATTACHED TO POST) THE MANUFACTURER'S INSTALLATION INSTRUCTION SHALL BE ADHERED TO.
3. FENCE STAKES MAY BE WOOD OR METAL, MUST BE CAPABLE OF SUPPORTING ANTICIPATED LOADS.



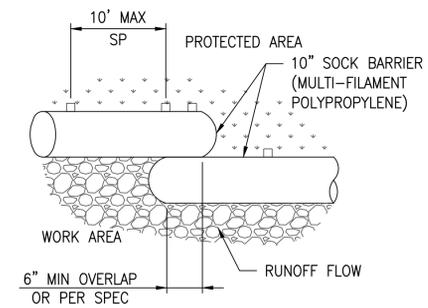
**1 SILT FENCE**  
C-4.0 NOT TO SCALE



**SECTION**



**PLAN**



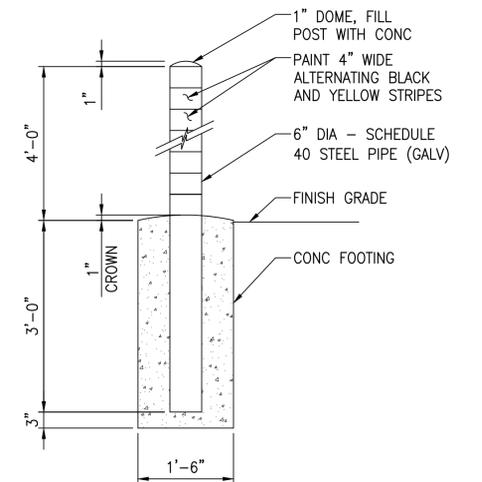
**OVERLAP**

SLOPE GRADIENT	ANCHOR SPACING
<4:1	NOT REQ'D
4:1 TO 3:1	10'
>3:1 TO 2:1	5' to 10'
>2:1	5'

**NOTES:**

1. SOCK BARRIER FILL COMPOSITION IS WOOD MULCH.
2. SOCK BARRIER FILL SHALL NOT CONTAIN BIOSOLIDS AND SHOULD BE CONSISTENT WITH EPA GUIDELINES.

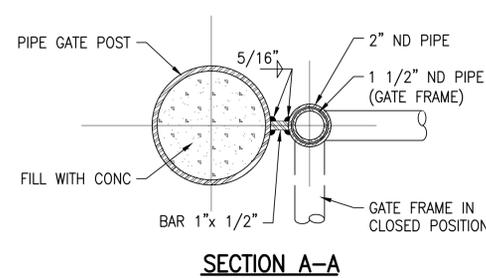
**2 FILTER SOCK BARRIER**  
C-4.0 NOT TO SCALE



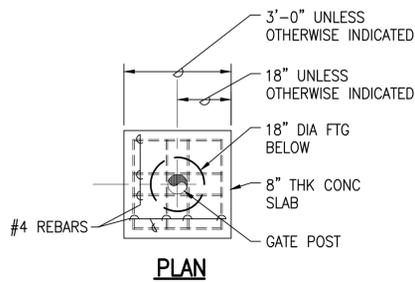
**3 BOLLARD DETAIL**  
C-4.0 3/4" = 1'-0"

REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
New Educational Telescope University of Hawaii at Hilo				
DETAILS				
SSFM INTERNATIONAL, INC.				
DESIGNED BY: RRM		CHECKED BY:		PROJECT NO. UHH-16061
DRAWN BY: CA		APPROVED BY:		SHEET C-4.0
SCALE: AS NOTED		DATE NOV. 2021		OF 19 SHTS

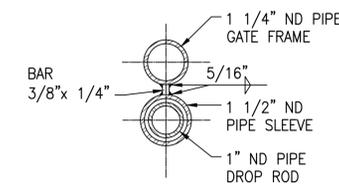
SHEET SIZE: 24" X 36" FILE NAME: C:\CIVIL 3D PROJECTS\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\01 CE DWG\C-41 DETAILS.DWG BY: ELUMBANG



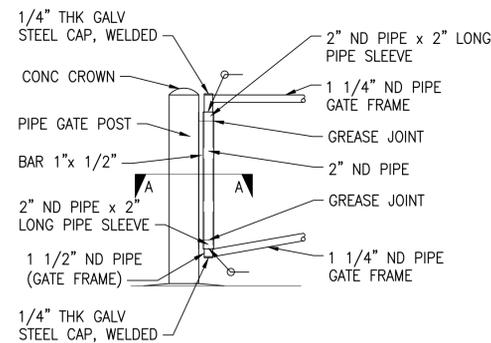
**SECTION A-A**



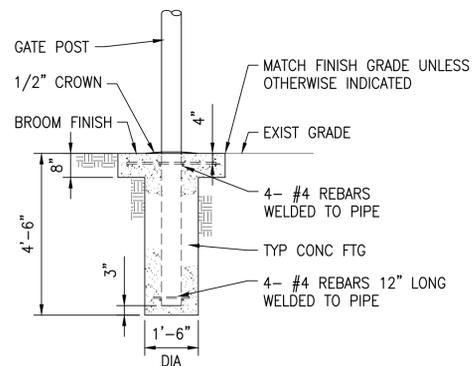
**PLAN**



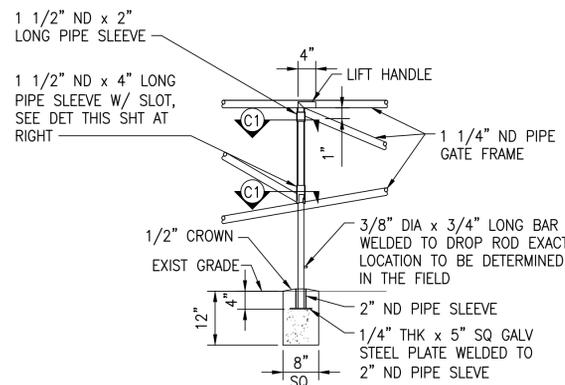
**SECTION "C1"**



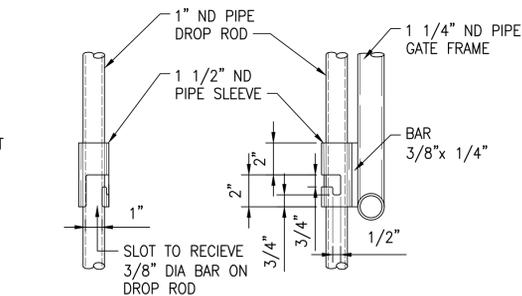
**ELEVATION HINGE**



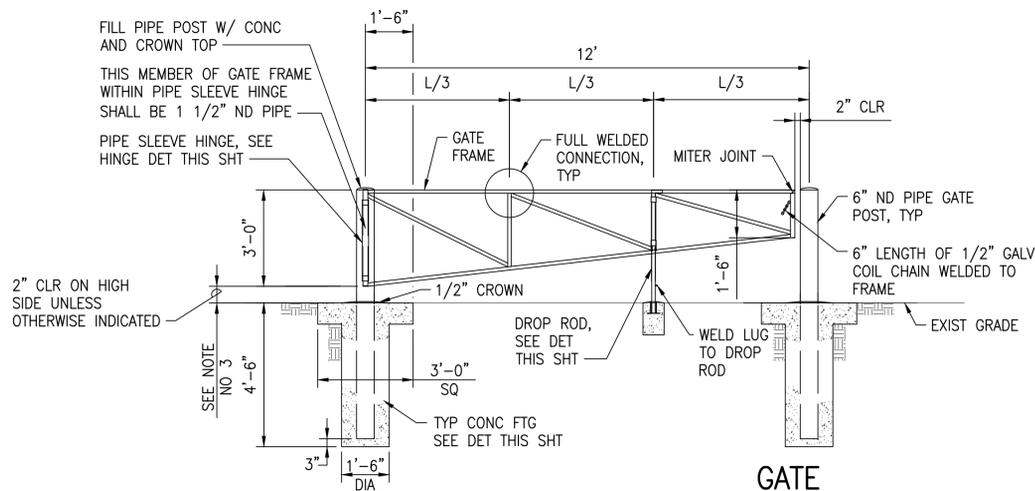
**SECTION FOOTING**



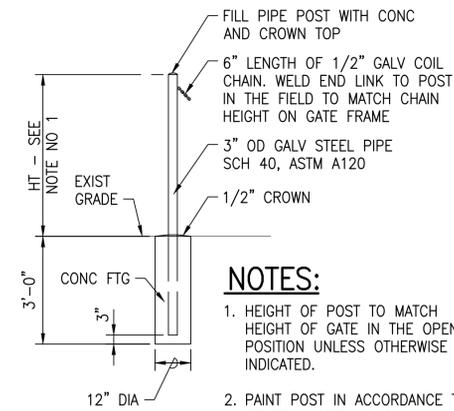
**FRONT ELEVATION DROP ROD**



**FRONT ELEVATION SIDE ELEVATION DROP ROD**

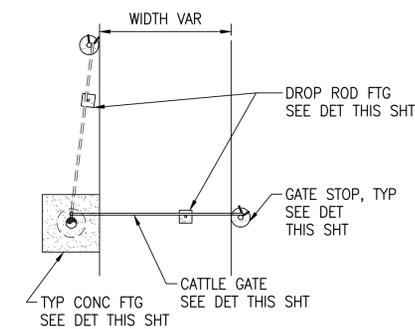


**GATE**



**GATE STOP**

- NOTES:**
- HEIGHT OF POST TO MATCH HEIGHT OF GATE IN THE OPEN POSITION UNLESS OTHERWISE INDICATED.
  - PAINT POST IN ACCORDANCE TO GENERAL NOTE NO 2.



**HALF GATE LAYOUT PLAN**

**GENERAL NOTES:**

- ALL PIPES SHALL BE SCHEDULE 40, ASTM A120 GALVANIZED STEEL.
- GATE FRAMES AND POSTS SHALL BE PAINTED WITH ONE COAT GALVANIZED METAL PRIMER AND TWO COATS YELLOW FINISH PAINT. PREPARE SURFACE PRIOR TO PAINTING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND THE CONTRACT SPECIFICATIONS.
- ADJUST CLEAR DIMENSION TO MAKE BOTH FRAMES LEVEL WITH EACH OTHER AND TO ALLOW GROUND CLEARANCES FOR GATE SWING.
- ALL WELDS AND DAMAGED GALVANIZED SURFACES SHALL BE PAINTED WITH 2 COATS OF ZRC COLD GALVANIZING COMPOUND PRIOR TO PAINTING.

SIZE OF PIPE N.D. (IN)	WEIGHT PER FOOT (LBS)
1	1.68
1 1/4	2.27
1 1/2	2.72
2	3.65
6	18.97

**1 CATTLE GATE DETAIL**  
C-4.1 NOT TO SCALE

REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
<b>New Educational Telescope</b> University of Hawaii at Hilo				
<b>DETAILS</b>				
SSFM INTERNATIONAL, INC.				
DESIGNED BY: RRM	CHECKED BY:	PROJECT NO. UHH-16061	SHEET <b>C-4.1</b>	
DRAWN BY: CA	APPROVED BY:	DATE NOV. 2021	OF 19 SHEETS	
SCALE: AS NOTED				

SHEET SIZE: 24" X 36" FILE NAME: M:\2020\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\DWG\STRUC\STRUC PLAN.DWG BY: KWONG

**GENERAL NOTES**

- A. SEE ALSO:
  - 1. CONTRACT DOCUMENTS
  - 2. SPECIAL NOTES ON DRAWINGS
- B. DISCREPANCIES – CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS AND SHALL REPORT DISCREPANCIES IN WRITING TO THE OWNER’S REPRESENTATIVE BEFORE COMMENCING WORK OR ORDERING MATERIALS.
- C. MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE IN ADDITION TO THE CODES CITED.
- D. DETAILS SHOWN ON DRAWINGS SHALL BE TYPICAL FOR SIMILAR CONDITIONS. MODIFY DETAILS FOR SPECIAL CONDITIONS AS DIRECTED BY THE OWNER’S REPRESENTATIVE.

**CONSTRUCTION NOTES**

- A. NEITHER THE PROFESSIONAL ACTIVITIES OF SSFM INTERNATIONAL, INC. (SSFM), NOR THE PRESENCE OF SSFM OR SSFM’S EMPLOYEES AT A CONSTRUCTION SITE, SHALL RELIEVE THE GENERAL CONTRACTOR AND ANY OTHER ENTITY OF THEIR OBLIGATIONS, DUTIES, AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCES, TECHNIQUES, OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING, OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND HEALTH OR SAFETY PRECAUTIONS REQUIRED BY REGULATORY AGENCIES. SSFM AND SSFM’S PERSONNEL HAVE NO AUTHORITY TO EXERCISE CONTROL OVER CONSTRUCTION CONTRACTOR OR OTHER ENTITY OR THEIR EMPLOYEES IN CONNECTION WITH THEIR WORK OR HEALTH OR SAFETY PRECAUTIONS.
- B. THE CONTRACTOR SHALL NOTIFY THE OWNER’S REPRESENTATIVE AT LEAST 48 HOURS IN ADVANCE FOR REVIEW AND OBSERVATION OF EXCAVATIONS, REINFORCING, AND CONCRETE POURS.
- C. CONSTRUCTION LOADING SHALL NOT EXCEED THE DESIGN LIVE LOAD UNLESS SPECIAL SHORING IS PROVIDED. ALLOWABLE LOADS SHALL BE REDUCED IN AREAS WHERE THE STRUCTURE HAS NOT ATTAINED ITS FULL DESIGN STRENGTH.

**EARTHWORK NOTES**

- A. BACKFILL MATERIALS SHOULD CONSIST OF SELECT GRANULAR FILLS, AND SHOULD BE NON-EXPANSIVE GRANULAR MATERIAL. THE SELECT GRANULAR FILL SHOULD BE WELL-GRADED FROM COARSE TO FINE WITH PARTICLES NO LARGER THAN 3 INCHES. THE MATERIAL SHALL HAVE A CBR VALUE OF 20 OR HIGHER, AND A SWELL POTENTIAL OF 1% OR LESS WHEN TESTED IN ACCORDANCE WITH ASTM D1883. THE MATERIAL SHOULD ALSO CONTAIN LESS THAN 30% PARTICLES PASSING THE NO. 200 SIEVE.
- B. EXCAVATED ON-SITE MATERIALS MAY BE REUSED AS A SOURCE OF SELECT GRANULAR FILL.
- C. SELECT GRANULAR FILL SHOULD BE PLACED IN LEVEL LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS, MOISTURE-CONDITIONED TO ABOVE THE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO A MINIMUM OF 90% RELATIVE COMPACTION.
- D. DUE TO THE RELATIVELY DRY CONDITION OF THE EXISTING MATERIALS AT THE SITE, MOISTURE-CONDITIONING WILL LIKELY BE REQUIRED TO ACHIEVE PROPER COMPACTION. COMPACTION SHOULD BE ACCOMPLISHED BY SHEEPSFOOT ROLLERS, VIBRATORY ROLLERS, OR OTHER TYPES OF ACCEPTABLE COMPACTION EQUIPMENT. WATER TAMPING, JETTING, OR PONDING SHOULD NOT BE ALLOWED TO COMPACT THE FILLS.

**CONCRETE NOTES**

A. CONCRETE SHALL DEVELOP THE FOLLOWING MINIMUM ULTIMATE COMPRESSIVE STRENGTHS, WITH CORRESPONDING MAXIMUM SIZE OF AGGREGATES AND WATER/CEMENT RATIOS AS FOLLOWS (UNLESS SHOWN ELSEWHERE IN SCHEDULES):

ELEMENT	28 DAY STRENGTH (PSI)	MAXIMUM SIZE AGGREGATE	WATER/CEMENT RATIO
1. FOOTINGS AND PEDESTAL	3000	1 1/2"	0.50

- B. ADMIXTURES: USE OF ADMIXTURE AT CONTRACTOR’S OPTION, BUT SUBJECT TO OWNER’S REPRESENTATIVE’S APPROVAL.
- C. UNLESS OTHERWISE SHOWN, CONSTRUCTION JOINTS SHALL BE LOCATED BY THE CONTRACTOR SUBJECT TO THE APPROVAL OF THE OWNER’S REPRESENTATIVE. THEY SHALL BE SO LOCATED AS TO LEAST IMPAIR THE STRENGTH OF THE STRUCTURE AND TO MINIMIZE SHRINKAGE STRESSES. PROVIDE DOWELS AS DIRECTED AND THOROUGHLY CLEAN AND ROUGHEN SURFACES BEFORE PROCEEDING WITH NEXT POUR (THIS REQUIREMENT APPLIES TO FLOORS AND WALLS).
- D. THE USE OF CALCIUM CHLORIDE IN CONCRETE IS PROHIBITED.
- E. EPOXY SHALL BE 2-COMPONENT, SOLVENT FREE, MOISTURE INSENSITIVE, HIGH MODULUS, HIGH STRENGTH, STRUCTURAL EPOXY ADHESIVE. IT SHALL MEET ASTM C-881, TYPE I AND II, GRADE 3 CLASS B AND C EPOXY RESIN ADHESIVE.

**REINFORCING STEEL NOTES**

- A. STRENGTHS – UNLESS OTHERWISE NOTED ON PLANS, REINFORCING BARS SHALL BE ASTM A615, GRADE 60.
- B. SPLICES:
  - 1. LENGTHS SHALL BE 48 BAR DIAMETERS OR 2’-0” WHICHEVER IS GREATER, UNLESS OTHERWISE SHOWN.
- C. MINIMUM CONCRETE CLEAR COVER:
  - 1. FOOTINGS, ETC., POURED AGAINST EARTH . . . . . 3"
  - 2. FOOTINGS, ETC., POURED AGAINST FORMS AND LATER EXPOSED TO EARTH . . . . . 2"
  - 3. COLUMNS AND BEAMS (FROM TIES OR STIRRUPS) . . . . . 1 1/2"
  - 4. WALLS AND SLABS EXPOSED TO WEATHER OR GROUND:
    - (A) #5 BAR OR SMALLER . . . . . 1 1/2"
    - (B) #6 BAR OR LARGER . . . . . 2"
  - 5. SLABS AND WALLS (PROTECTED) . . . . . 3/4"
- D. BAR BENDS, HOOKS, AND OFFSETS SHALL BE IN ACCORDANCE WITH THE ACI RECOMMENDATIONS.
- E. SPECIAL SPACER CHAIRS: PLASTIC SPACER "CHAIRS" SHALL BE USED TO MAINTAIN REQUIRED MINIMUM CONCRETE CLEAR COVER FOR BEAM, COLUMN, AND WALL REINFORCING AT FACES EXPOSED TO WEATHER.

**ALUMINUM DECK SYSTEM NOTES**

- A. ALUMINUM RAILINGS:
  - 1. PROVIDE MANUFACTURER TECHNICAL LITERATURE OF PRODUCT DATA.
  - 2. PROVIDE SHOP DRAWINGS SHOWING RAILING LAYOUT AND ANCHORAGE TO PRIMARY STRUCTURE.
- B. ALUMINUM JOIST AND DECKING:
  - 1. PROVIDE MANUFACTURER TECHNICAL LITERATURE OF PRODUCT DATA.
  - 2. PROVIDE SHOP DRAWINGS AND CALCULATIONS SHOWING JOIST FRAMING AND CONNECTIONS. SEE GENERAL NOTES, DESIGN DATA FOR LOADING REQUIREMENTS.
  - 3. PROVIDE SHOP DRAWINGS AND CALCULATIONS SHOWING PLANK LAYOUT AND CONNECTIONS. SEE GENERAL NOTES, DESIGN DATA FOR LOADING REQUIREMENTS.

**DESIGN DATA**

- A. SUPERIMPOSED LIVE LOADS:
  - 1. ELEVATED PLATFORM . . . . . 60 PSF
  - 2. SNOW . . . . . 20 PSF
- B. SUPERIMPOSED DEAD LOADS:
  - 1. ELECTRICAL HUNG SYSTEMS . . . . . 5 PSF
  - 2. PLANEWAVE CDK700 TELESCOPE . . . . . 1500 LBS
  - 3. ASTROHAVEN DOME . . . . . 2140 LBS
- C. LATERAL LOADS:
  - 1. SEISMIC: INTERNATIONAL BUILDING CODE – 2018 EDITION; ASCE 7-16  
 IMPORTANCE FACTOR =1.0  
 NONBUILDING STRUCTURE FOR MECHANICAL COMPONENTS (ap = 1.0, Rp = 2.5)  
 SITE CLASS = D  
 Ss = 1.5g; S1 = 0.6g  
 Ses = 1.2; Sot =  
 SEISMIC DESIGN CATEGORY =
  - 2. WIND: INTERNATIONAL BUILDING CODE – 2018 EDITION; ASCE 7-16  
 200 MPH DESIGN WIND VELOCITY (COMPONENTS AND CLADDING)  
 EXPOSURE "C"  
 Kzt = 1.5  
 GCpi = ±0.55
- D. FOUNDATION:
 

THE FOUNDATION HAS BEEN DESIGNED IN ACCORDANCE WITH REPORT PREPARED BY GEOLABS, INC, TITLED "GEOTECHNICAL ENGINEERING CONSULTATION HALEPOHAKU EDUCATIONAL TELESCOPE, UNIVERSITY OF HAWAII AT HILO, MAUNA KEA, ISLAND OF HAWAII", DATED MAY 3, 2021:

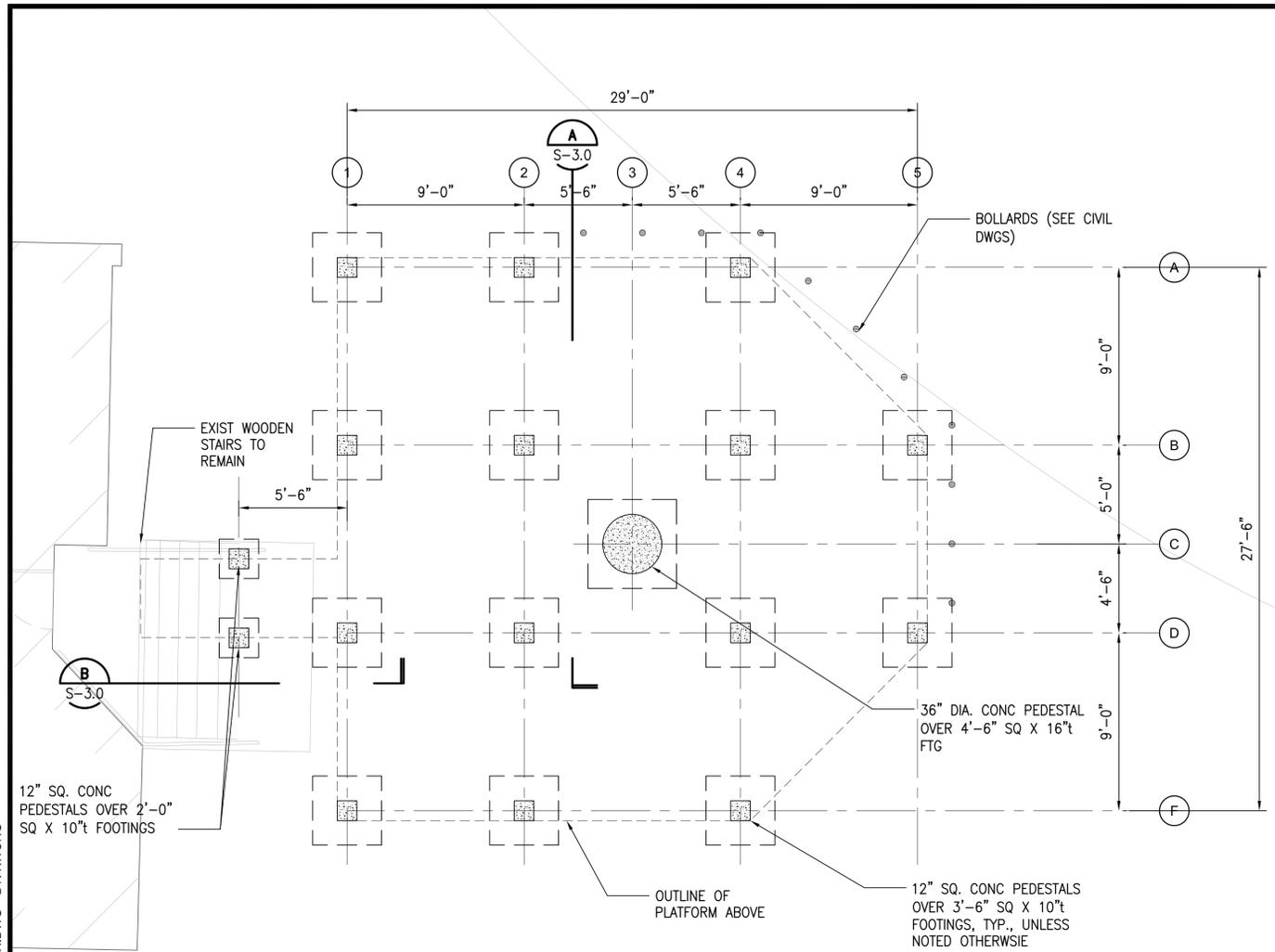
  - 1. ALLOWABLE SOILS BEARING PRESSURE . . . . . 2500 PSF
  - 2. COEFFICIENT OF FRICTION . . . . . 0.45
  - 3. PASSIVE EARTH PRESSURE . . . . . 350 PCF

**SPECIAL INSPECTION NOTES**

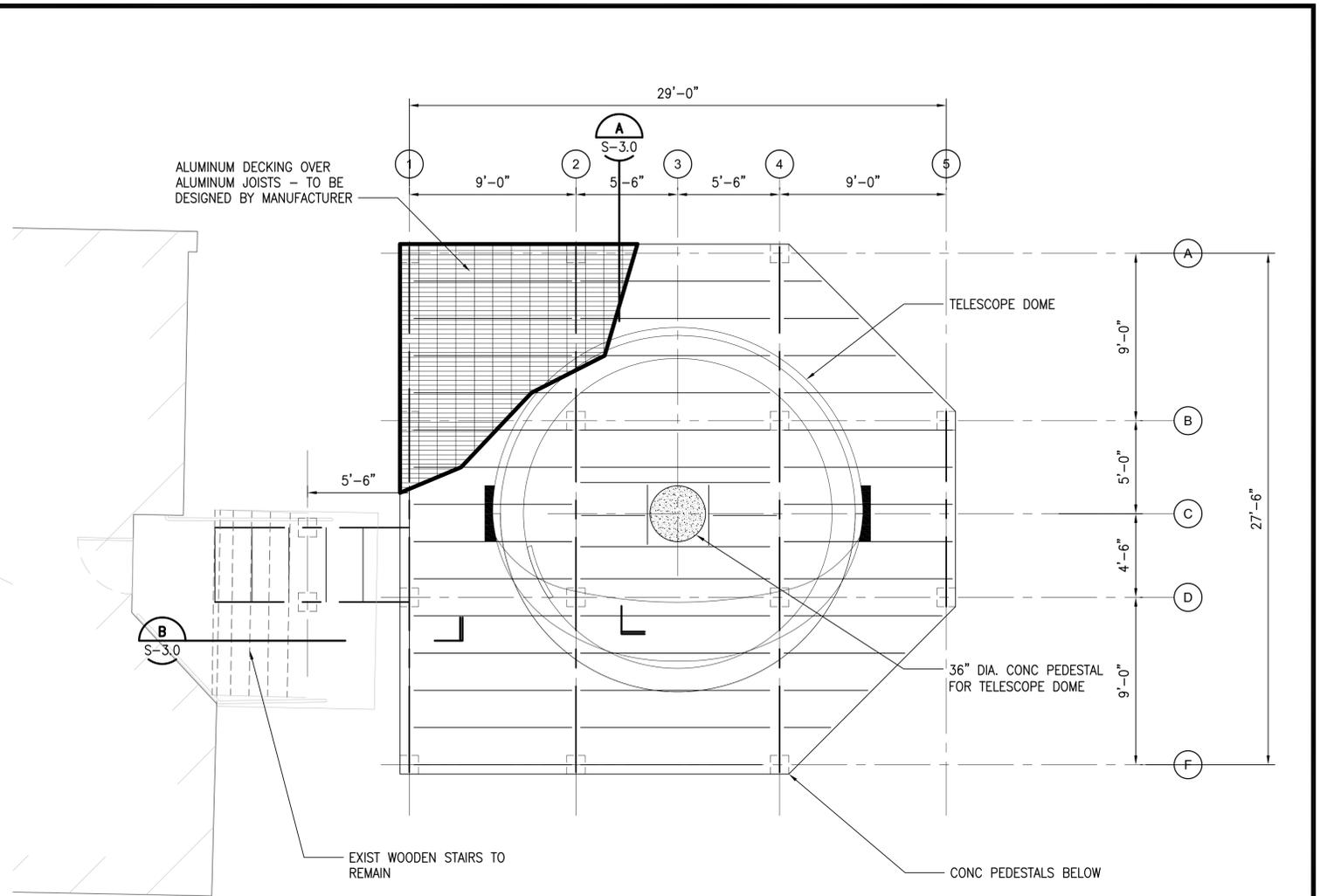
- A. SPECIAL INSPECTION PROVISIONS OF SECTION 1704 OF THE 2018 INTERNATIONAL BUILDING CODE GOVERN THE STRUCTURAL WORK AS DESCRIBED IN THE CONSTRUCTION DOCUMENTS. THE SPECIAL INSPECTOR SHALL BE HIRED BY THE OWNER.
- B. THE FOLLOWING STRUCTURAL WORK FOR THIS PROJECT REQUIRE SPECIAL INSPECTIONS:
  - 1. CONCRETE
  - 2. REINFORCING STEEL
  - 3. BOLTS INSTALLED IN CONCRETE
- C. THE MINIMUM RESPONSIBILITIES OF THE SPECIAL INSPECTOR SHALL BE AS OUTLINED IN THE "SPECIAL INSPECTION RECOMMENDED STANDARD OF PRACTICE", 2ND EDITION, PUBLISHED BY THE STRUCTURAL ENGINEERS ASSOCIATION OF HAWAII.
- D. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY THE SPECIAL INSPECTOR OF ITEMS REQUIRING SPECIAL INSPECTION A MINIMUM OF 48 HOURS IN ADVANCE.
- E. SPECIAL INSPECTIONS DO NOT RELIEVE THE GENERAL CONTRACTOR OF HIS RESPONSIBILITIES TO COMPLETE THE PROJECT IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND TO BE RESPONSIBLE FOR SAFETY ON THE JOBSITE.
- F. THE SPECIAL INSPECTOR SHALL SUBMIT A FINAL REPORT TO THE BUILDING DEPARTMENT, ARCHITECT, STRUCTURAL ENGINEER AND OWNER STATING WHETHER THE WORK REQUIRING SPECIAL INSPECTION WAS, TO THE BEST OF HIS/HER KNOWLEDGE, IN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE BUILDING CODE.
- G. THE SPECIAL INSPECTOR SHALL BE CERTIFIED AS A SPECIAL INSPECTOR BY THE BUILDING DEPARTMENT OR THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO).

REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
				
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII <h2 style="margin: 0;">New Educational Telescope</h2> University of Hawaii at Hilo				
<b>GENERAL NOTES</b>				
SSFM INTERNATIONAL, INC.				
DESIGNED BY: KW			PROJECT NO. UHH-16061	
DRAWN BY: KW			<h1 style="margin: 0;">S-0.0</h1>	
SCALE: AS NOTED				
CHECKED BY:			DATE NOV. 2021	
APPROVED BY:			SHT. 19 OF 19	

SHEET SIZE: 24" X 36" FILE NAME: M:\2020\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\DWG\STRUCTURAL\STRUC PLN.DWG BY: KWONG



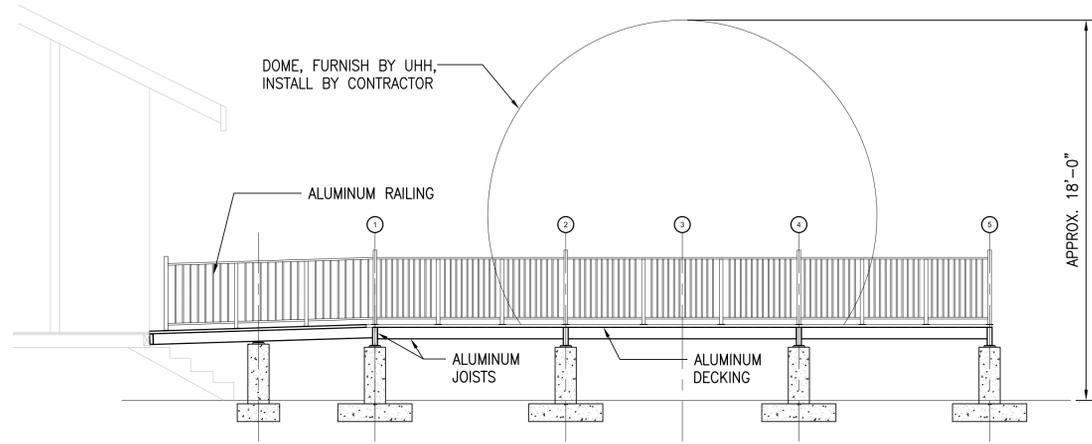
**1 FOUNDATION PLAN**  
S-1.0 SCALE: 1/4" = 1'-0"



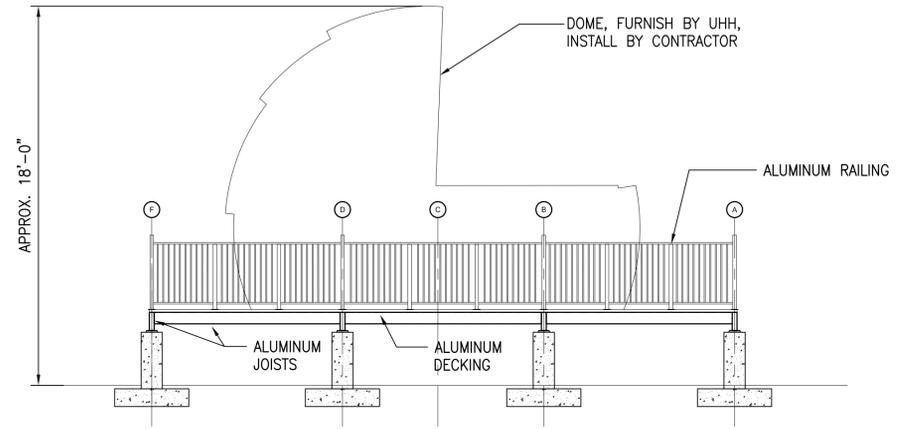
**2 PLATFORM FRAMING PLAN**  
S-1.0 SCALE: 1/4" = 1'-0"

REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
		UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII		
		New Educational Telescope University of Hawaii at Hilo		
		<b>FOUNDATION, PLATFORM FRAMING PLAN</b>		
		SSFM INTERNATIONAL, INC.		
DESIGNED BY: KW		CHECKED BY:		PROJECT NO. UHH-16061
DRAWN BY: KW		APPROVED BY:		DATE NOV. 2021
SCALE: AS NOTED				SHEET <b>S-1.0</b> OF 19 SHTS

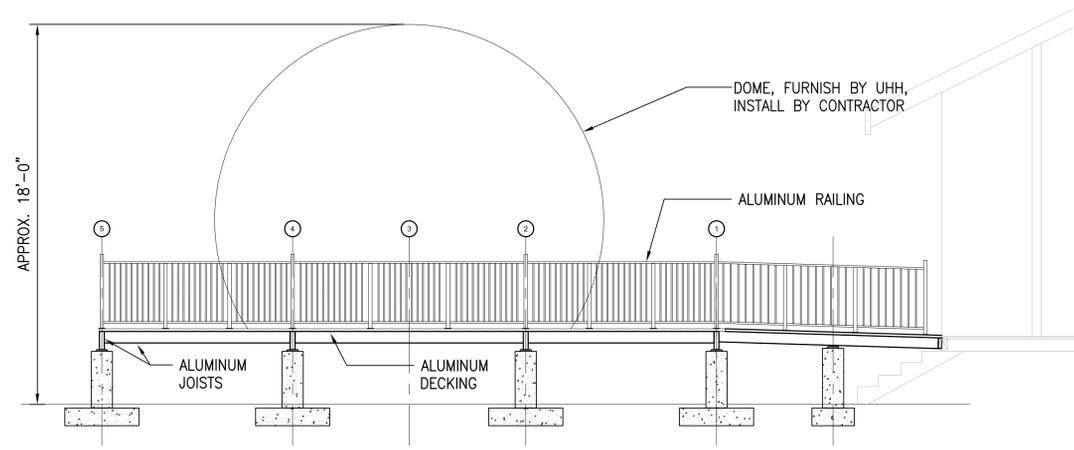
SHEET SIZE: 24" X 36" FILE NAME: M:\2020\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE.DWG STRUCTURAL PLAN.DWG BY: KWONG



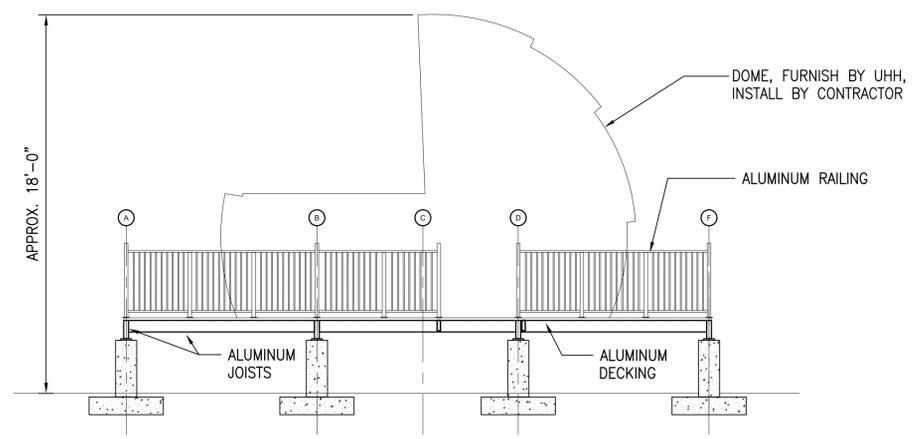
**1 SOUTH ELEVATION**  
S-2.0 SCALE: 1/4" = 1'--0"



**2 EAST ELEVATION**  
S-2.0 SCALE: 1/4" = 1'--0"



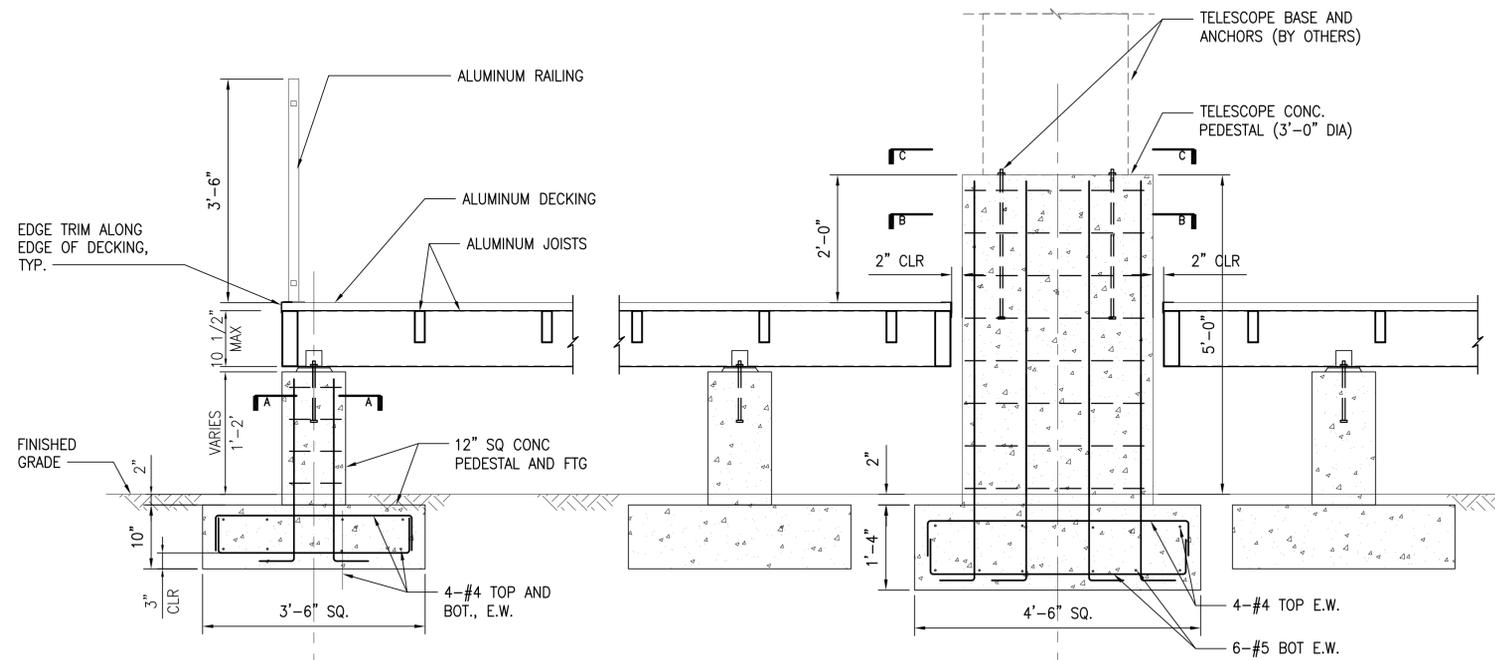
**3 NORTH ELEVATION**  
S-2.0 SCALE: 1/4" = 1'--0"



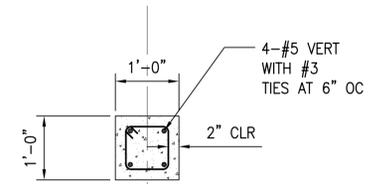
**4 WEST ELEVATION**  
S-2.0 SCALE: 1/4" = 1'--0"

REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
		UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII		
		<b>New Educational Telescope</b> University of Hawaii at Hilo		
		<b>ELEVATIONS</b>		
		SSFM INTERNATIONAL, INC.		
DESIGNED BY: KW		CHECKED BY:		PROJECT NO. UHH-16061
DRAWN BY: KW		APPROVED BY:		DATE NOV. 2021
SCALE: AS NOTED				SHEET <b>S-2.0</b> OF 19 SHTS

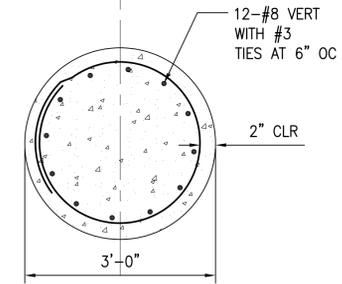
SHEET SIZE: 24" X 36" FILE NAME: M:\2020\2020_037.000 UHH HALEPOHAKU EDUCATIONAL TELESCOPE\DWG\STRUCTURAL\PLANDWG BY: KWONG



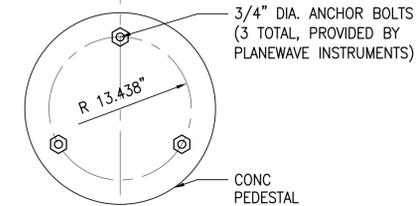
**A** SECTION THRU PLATFORM  
S-3.0 SCALE: 3/4" = 1'-0"



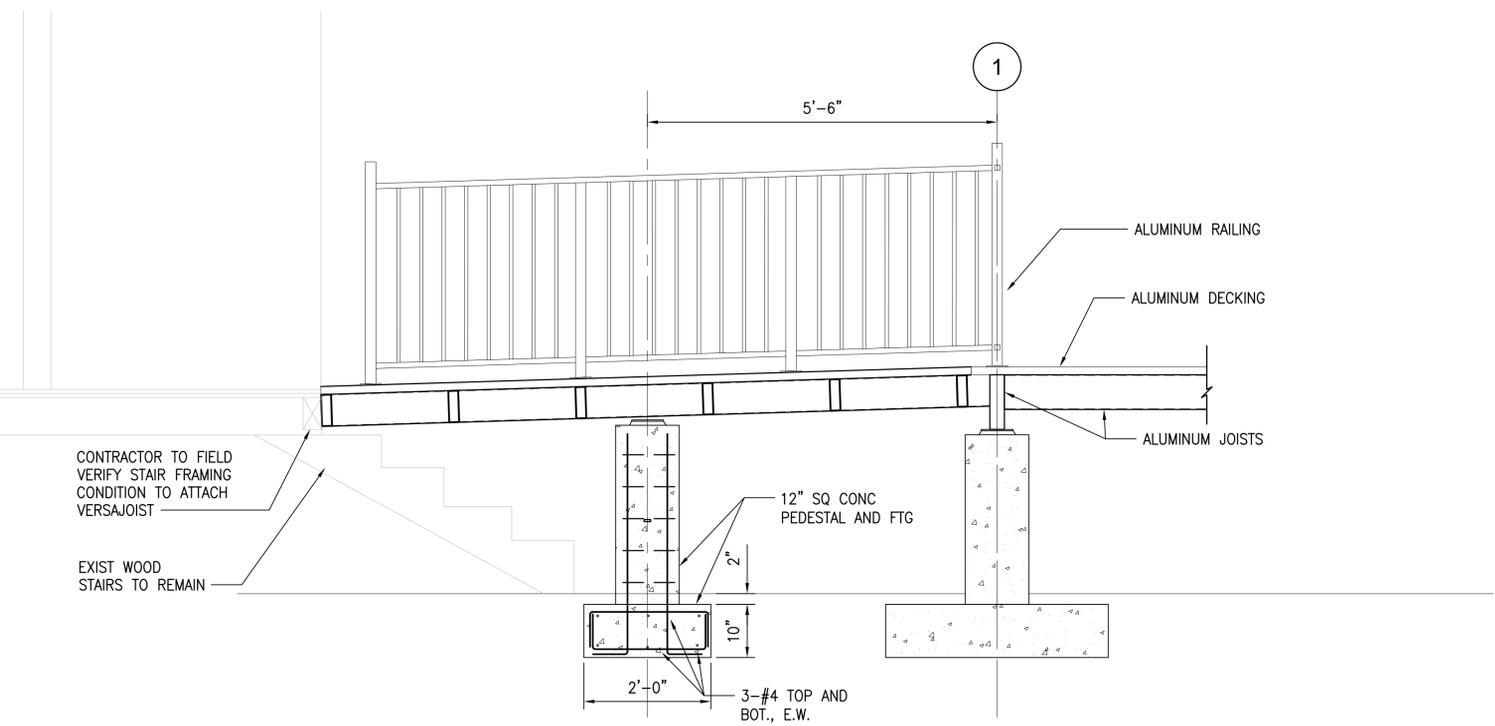
SECTION A-A



SECTION B-B



SECTION C-C



**B** SECTION THRU PLATFORM  
S-3.0 SCALE: 3/4" = 1'-0"

REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
		UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII		
		New Educational Telescope University of Hawaii at Hilo		
SECTION AND DETAILS				
SSFM INTERNATIONAL, INC.				
DESIGNED BY: KW	CHECKED BY:	PROJECT NO. UHH-16061	SHEET S-3.0	
DRAWN BY: KW	APPROVED BY:	DATE NOV. 2021	OF 19 SHTS	
SCALE: AS NOTED				

SHEET SIZE: 24" X 36" FILE NAME: M:\EO PROJECTS\2020 PROJECTS\14009-20-02 HALE POKAHU ED TELESCOPE\4-DWG\MECHANICAL\M-X.DWG BY: DANIEL HONG

MECHANICAL ABBREVIATIONS			
(E)	EXISTING	FPM	FEET PER MINUTE
(D)	DEMOLISH	FT	FEET
(N)	NEW	HTR	HEATER
(R)	RELOCATED	HZ	HERTZ
A	AMPERE	KW	KILOWATT
A/C	AIR CONDITIONING	LAT	LEAVING AIR TEMPERATURE
ABV	ABOVE	LBS	POUNDS
ADJ	ADJUSTABLE	MAN	MANUFACTURER
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
ACCU	AIR COOLED CONDENSING UNIT	MCA	MINIMUM CIRCUIT AMPS
AHU	AIR HANDLING UNIT	MECH	MECHANICAL
APPROX	APPROXIMATELY	MIN	MINIMUM
ARCH	ARCHITECT	MOCP	MAXIMUM OVERCURRENT PROTECTION
BLDG	BUILDING	MTD	MOUNTED
BHP	BRAKE HORSEPOWER	NOM	NOMINAL
BV	BALL VALVE	OA	OUTSIDE AIR
CAP	CAPACITY	PH	PHASE
CD	CEILING DIFFUSER	PLMB	PLUMBING
CLG	CEILING	QTY	QUANTITY
CFM	CUBIC FEET PER MINUTE	REQ'D	REQ'D
CONC	CONCRETE	RM	ROOM
CONN	CONNECT	RA	RETURN AIR
CONT	CONTINUATION	RAR	RETURN AIR REGISTER
DB	DRY BULB	RLA	RUNNING LOAD AMPS
DBA	DECIBELS (A-WEIGHTED)	SA	SUPPLY AIR
DN	DOWN	SQ	SQUARE
EA	EXHAUST AIR	SS	STAINLESS STEEL
EAT	ENTERING AIR TEMPERATURE	TDH	TOTAL DISCHARGE HEAD
EF	EXHAUST FAN	TEMP	TEMPERATURE
ELEC	ELECTRICAL	TYP	TYPICAL
ER	EXHAUST REGISTER	V	VOLT
ESP	EXTERNAL STATIC PRESSURE	VAV	VARIABLE AIR VOLUME
EXH	EXHAUST	VD	MANUAL VOLUME DAMPER
EXIST	EXISTING	VTR	VENT TO ROOF
FC	FAN COIL	W	WATT
FD	FIRE DAMPER	W/	WITH
FLA	FULL LOAD AMPS	WB	WET BULB
FLEX	FLEXIBLE	ZD	ZONE DAMPER
FLR	FLOOR		

MECHANICAL SYMBOLS			
	SHEET METAL DUCTWORK		EQUIPMENT TAG
	DUCTWORK TRANSITION		DETAIL DESIGNATION
	DEMOLITION		CEILING ACCESS PANEL
	SUPPLY OR OA DUCT ELBOW DOWN		PIPE RISER TO UPPER LEVEL
	RETURN OR EXHAUST DUCT ELBOW DOWN		CAPPED LINE
	45° BOOT BRANCH TAKEOFF		PIPE ELBOW UP/DOWN
	DUCT CONTINUATION		PIPE BRANCH TOP CONNECTION
	ELBOW WITH TURNING VANES		PIPE BRANCH BOTTOM CONNECTION
	SUPPLY OR OA DUCT UP		PIPE UNION
	RETURN AIR OR EXHAUST DUCT UP		POINT OF CONNECTION
	EXHAUST AIR DUCT UP		POINT OF DISCONNECTION
	SUPPLY AIR DIFFUSER		
	RETURN AIR OR EXHAUST REGISTER		
	VOLUME DAMPER		
	FIRE DAMPER OR CEILING RADIATION DAMPER		
	COMBINATION FIRE SMOKE DAMPER		
	MOTORIZED DAMPER		
	BACKDRAFT DAMPER		
	THERMOSTAT MOUNTED AT MAX +48" A.F.F. TO THE TOP OF THE CONTROL DEVICE PLATE		

GENERAL MECHANICAL SPECIFICATIONS	
1.	PROVIDE COMPLETE AND OPERATING SYSTEMS AS SPECIFIED AND INDICATED ON DRAWINGS. "PROVIDE" SHALL MEAN "FURNISH AND INSTALL" WHEN USED HEREIN.
2.	WORK SHALL COMPLY WITH ALL LOCAL CODES AND ORDINANCES INCLUDING: ANSI B9.1/ASHRAE 15 – SAFETY CODE FOR MECHANICAL REFRIGERATION; HAWAII DOH CHAPTER 39, TITLE 11 – AIR CONDITIONING AND VENTILATION; HAWAII COUNTY BUILDING CODE; ASHRAE 62-2016 – VENTILATION STANDARD; SMACNA HVAC DUCT CONSTRUCTION STANDARDS; 2018 INTERNATIONAL ENERGY CONSERVATION CODE.
3.	CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS AND FEES.
4.	MATERIALS AND EQUIPMENT SHALL BE NEW AND GUARANTEED FOR ONE YEAR FROM THE DATE OF ACCEPTANCE. MATERIALS AND EQUIPMENT SHALL BE AS SCHEDULED OR EQUAL, MEETING THE REQUIREMENTS OF THE SPECIFICATION. MATERIALS AND EQUIPMENT SHALL BE SUBMITTED TO THE UNIVERSITY FOR APPROVAL PRIOR TO ORDER RELEASE. WORK SHALL BE GUARANTEED AGAINST DEFECTIVE WORKMANSHIP OR MATERIALS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT. WARRANTY WORK SHALL BE COMPLETED AT NO EXTRA CHARGE TO THE UNIVERSITY. FURNISH MANUFACTURER'S PRODUCT WARRANTY CERTIFICATES IN A BINDER.
5.	PRIOR TO COMMENCEMENT OF WORK AND ORDERING OF EQUIPMENT, CONTRACTOR SHALL SUBMIT 6 BOUND SETS OF PROPOSED MATERIALS AND EQUIPMENT. RECORD DRAWINGS, OPERATION MANUALS AND MAINTENANCE MANUALS SHALL BE SUBMITTED AS REQUIRED BY UNIVERSITY UPON COMPLETION.
6.	DRAWINGS SHALL NOT BE SCALED.
7.	PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. PROVIDE FIRE DAMPERS ON ALL DUCT PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE.
8.	MECHANICAL EQUIPMENT SHALL BE SECURED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND APPLICABLE SECTIONS OF THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
9.	ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT SHALL BE VERIFIED WITH ELECTRICAL DRAWINGS PRIOR TO ORDER RELEASE. ADDITIONAL ELECTRICAL WORK RESULTING FROM EQUIPMENT SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
10.	DUCTWORK, PIPING AND EQUIPMENT SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH THE SMACNA SEISMIC RESTRAINT MANUAL – GUIDELINES FOR MECHANICAL SYSTEMS.
11.	ELECTRICAL: CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. OBTAIN EQUIPMENT MANUFACTURER'S CONTROL WIRING DIAGRAMS FOR THE EQUIPMENT FURNISHED. ELECTRICAL EQUIPMENT SHALL BE FURNISHED WITH WEATHER PROOF (NEMA 4X WHEN POSSIBLE) ENCLOSURES FOR OUTDOOR INSTALLATIONS AND OTHERWISE AS INDICATED ON PLANS.
12.	FIELD INVESTIGATIONS: VISIT THE WORK-SITE AND BECOME FULLY AWARE OF ALL EXISTING CONDITIONS. INVESTIGATE THE CONTRACT DOCUMENTS AND MAKE PROPER PROVISIONS TO AVOID INTERFERENCES OR CONSTRUCTION DELAYS. DETERMINE THE EXACT ROUTE OF EACH DUCT AND PIPE. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE.
13.	WORK CONDITIONS: FIELD VERIFY CONDITIONS AND DIMENSIONS FOR INTERFERENCES. INSTALLED WORK SHALL BE PROTECTED DURING CONSTRUCTION AND CLEANED FOR FINAL INSPECTION. TOUCH-UP PAINT ALL RAW EDGES OF METAL EXPOSED TO WEATHER. COORDINATE WITH OTHER TRADES FOR PIPE SLEEVES AND INSTALLATION OF EQUIPMENT SUPPORTS.
14.	REQUIREMENTS: PERFORM WORK USING PERSONNEL SKILLED IN THE TRADE INVOLVED. PROVIDE COMPETENT SUPERVISION. FURNISH NEW EQUIPMENT, MATERIALS AND ACCESSORIES BEARING THE MANUFACTURER'S IDENTIFICATION AND CONFORMING TO THE RECOGNIZED COMMERCIAL STANDARDS.
15.	EQUIPMENT INSTALLATION: INSTALL EQUIPMENT IN THE SPACE ALLOTTED WITH SUFFICIENT CLEARANCE FOR PROPER OPERATION AND MAINTENANCE AND WITH SUFFICIENT HEAD CLEARANCE ACCORDING TO THE BUILDING CODE. WHERE EQUIPMENT DIFFERS IN ARRANGEMENT OR CONNECTIONS FROM THOSE SHOWN, PROVIDE ALL REQUIRED CHANGES IN PIPING, SUPPORTS AND APPURTENANCES. PROVIDE ACCESS PANELS WHERE REQUIRED FOR MAINTENANCE ACCESS TO EQUIPMENT.

HAWAII COUNTY ENERGY CODE 2015 IECC, HAWAII REVISED STATUTES HRS 107-24 TO 28 & HAWAII ADMINISTRATIVE RULES CHAPTER HAR 3-181.1 COMMERCIAL BUILDING ENERGY EFFICIENCY STANDARDS			
I CERTIFY THAT, TO THE BEST OF KNOWLEDGE, THIS PROJECTS DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE COMMERCIAL PROVISIONS FOR MECHANICAL SYSTEMS (C403, C404, & C405) OF THE 2015 IECC WITH AMENDMENTS PER HAR 3-181.1:			
COMPLIANCE METHOD			
X	2018 IECC AS AMENDED. MANDATORY AND PRESCRIPTIVE		
	2018 IECC AS AMENDED. MANDATORY AND TOTAL BUILDING PERFORMANCE		
	ASHRAE STANDARD 90.1-2013. MANDATORY AND PRESCRIPTIVE		
	ASHRAE STANDARD 90.1-2013. MANDATORY AND ENERGY COST BUDGET		
INFORMATION IN CONSTRUCTION DOCUMENTS		YES	N/A
HVAC SYSTEMS			
	EQUIPMENT CAPACITY AND EFFICIENCY.	X	
	THERMOSTATIC CONTROLS.	X	
	GUEST ROOM DOOR SWITCHES.		X
	VENTILATION RATE.	X	
	DEMAND CONTROL VENTILATION CONTROLS.		X
	ENCLOSED PARKING GARAGE VENTILATION CONTROL.		X
	ENERGY RECOVERY VENTILATION SYSTEM.		X
	KITCHEN EXHAUST SYSTEM.		X
	DUCT AND PLENUM INSULATION THICKNESS/R-VALUE.		X
	DUCT AND PLENUM SEALING REQUIREMENTS.		X
	PIPE INSULATION THICKNESS/R-VALUE.	X	
	FAN MOTOR HORSEPOWER.		X
	FAN EFFICIENCY.		X
	FAN MOTOR EFFICIENCY.		X
	PUMP MOTOR EFFICIENCY.		X
	VARIABLE-FLOW FAN CONTROL.		X
	STATIC PRESSURE SENSOR LOCATION.		X
	STATIC PRESSURE RESET CONTROL.		X
	CHILLED WATER VARIABLE FLOW CONTROL.		X
	CHILLER ISOLATION.		X
	COOLING TOWER FAN CONTROL.		X
	TERMINAL UNIT MINIMUM AND MAXIMUM AIRFLOW.		X
	COMMISSIONING REQUIREMENTS.		X
REFRIGERATION			
	REFRIGERATION EQUIPMENT EFFICIENCY.		X
	WALK-IN COOLERS AND FREEZERS.		X
	REFRIGERATED WAREHOUSES.		X
	REFRIGERATED DISPLAY CASES.		X
SERVICE WATER HEATING			
	HEAT RECOVERY FOR SERVICE WATER HEATING.		X
	EQUIPMENT CAPACITY AND EFFICIENCY.		X
	PIPE INSULATION.		X
	HOT WATER PIPE LENGTH/VOLUME.		X
	HOT WATER CIRCULATION CONTROLS.		X
	HEATED POOL AND SPA COVERS.		X
	COMMISSIONING REQUIREMENTS.		X
NOTES:			
SIGNATURE: _____			
DATE: 11/19/21		NAME: NIMR Y. TAMIMI	
TITLE: MECHANICAL ENGINEER		LICENSE NO.: 7936-M	

REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
<b>New Educational Telescope</b> University of Hawaii at Hilo				
MECHANICAL SYMBOLS, IECC, & ABBREVIATIONS				
ENGINEERING PARTNERS, INC.				
DESIGNED BY: DH		CHECKED BY: EW		PROJECT NO. UHH-16061
DRAWN BY: DH		APPROVED BY: NYT		SHEET M-01
SCALE: AS NOTED		DATE: NOV. 2021		OF 19 SHEETS



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE _____

### AIR COOLED CONDENSING UNIT SCHEDULE

UNIT NO.	AREA SERVED	NOMINAL CAPACITY (TONS)	COMPRESSOR QTY/TYPE	CONDENSER EAT (°F)	ELECTRICAL			WEIGHT (LBS)	SYSTEM SEER	REMARKS
					V/HZ/PH	MCA	MOP			
ACCU 1	FC-1	1.83	1/TWIN ROTARY	95	208-230/60/1	10	15	120	18	FRIGIDAIRE HOME COMFORT OUTDOOR UNIT OR APPROVED EQUAL. FURNISHED BY UNIVERSITY, INSTALLED BY CONTRACTOR.

### FAN COIL UNIT SCHEDULE

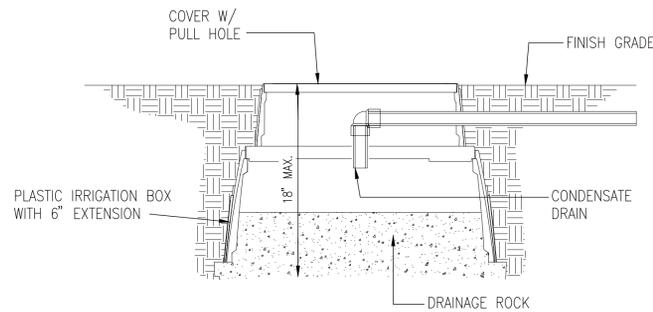
UNIT NO.	AREA SERVED	CFM	OA CFM	NOM. CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	ELECTRICAL DATA			UNIT WEIGHT (LB)	REMARKS
						POWER INPUT (W)	MOP	V/HZ/PH		
FC 1	DOME	585	-	22,000	21,400	POWERED BY ACCU-1			36	FRIGIDAIRE HOME COMFORT WALL MOUNTED UNIT OR APPROVED EQUAL. FURNISHED BY UNIVERSITY, INSTALLED BY CONTRACTOR.

### NOTES

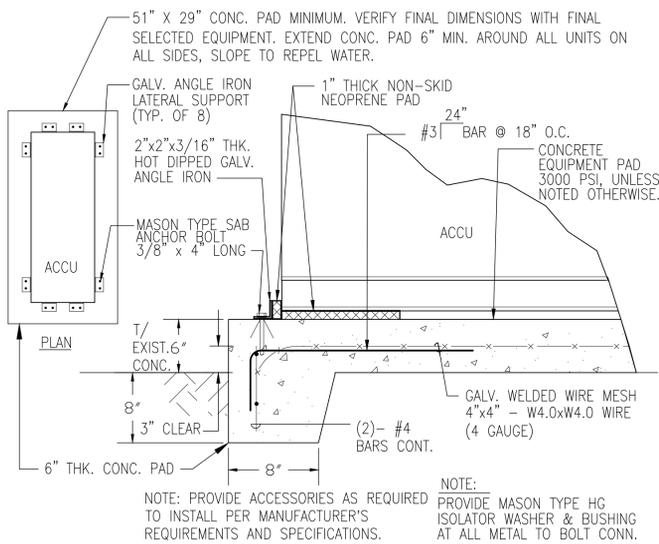
- PROVIDE PSX 700 OR APPROVED EQUAL FOR ALL OUTDOOR EQUIPMENT HOUSINGS (INTERNAL & EXTERNAL).
- PROVIDE BLYGOLD POLUAL XT OR APPROVED EQUAL FOR ALL OUTDOOR EQUIPMENT COILS.

### PIPING INSULATION NOTES

- PROVIDE PIPE INSULATION THICKNESSES PER IECC 2018 TABLE C403.11.3
- PIPING REQUIRING INSULATION SHALL BE INSULATED CONTINUOUSLY THROUGH CLAMPING, SUPPORTS, AND SLEEVING WITH THE INSULATION THICKNESS AND SPECIFICATIONS PER IECC (CURRENT EDITION).



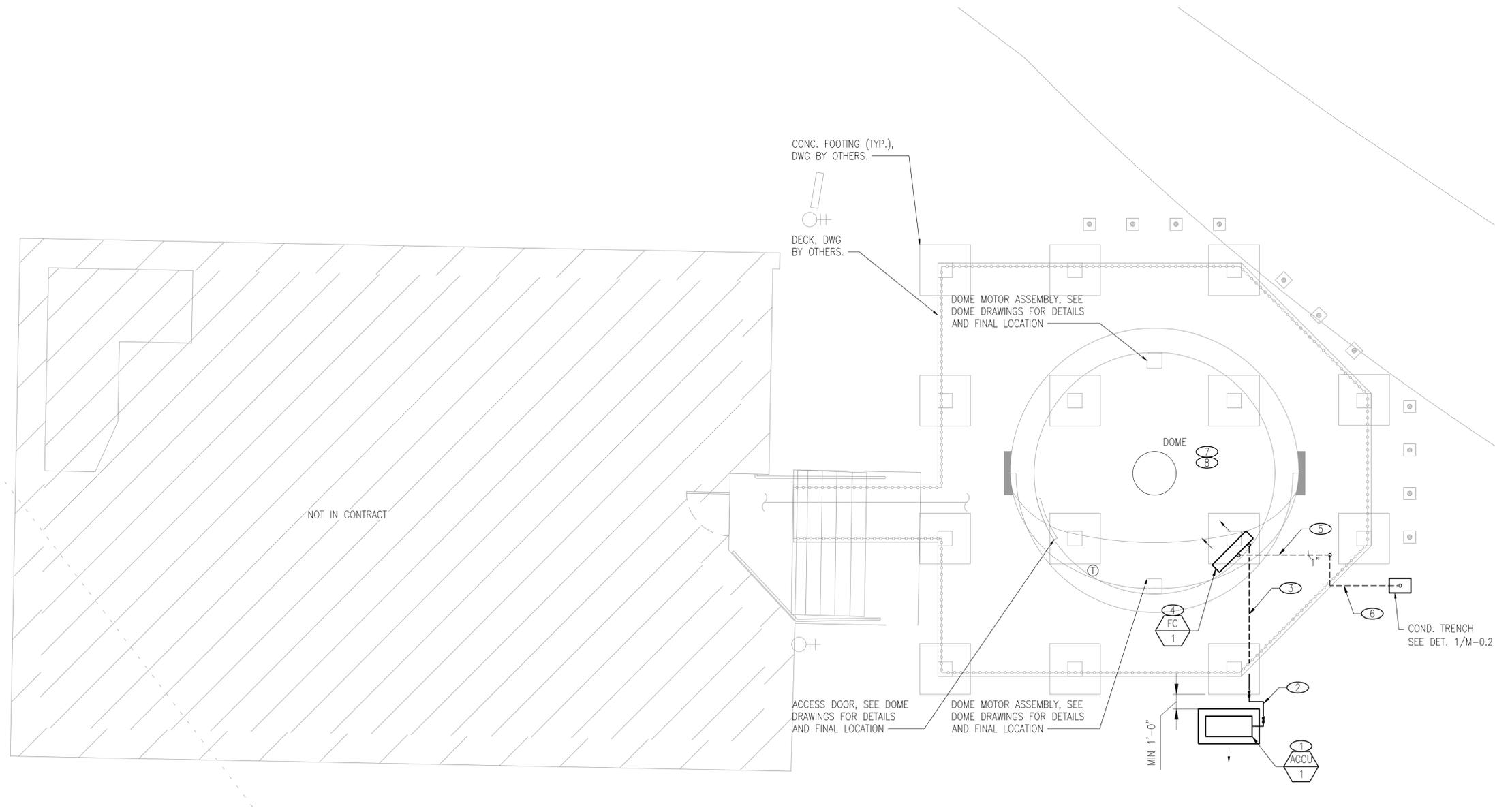
**1 CONDENSATE TRENCH DETAIL**  
NO SCALE



**2 ACCU LATERAL SUPPORT DETAIL**  
NO SCALE

REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE
		UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII		
		<b>New Educational Telescope</b> University of Hawaii at Hilo		
MECHANICAL SCHEDULES AND DETAILS				
ENGINEERING PARTNERS, INC.				
DESIGNED BY: DH	CHECKED BY: EW	PROJECT NO. UHH-16061	SHEET <b>M-02</b>	
DRAWN BY: DH	APPROVED BY: NYT	DATE NOV. 2021	19 OF 19 SHEETS	
SCALE: AS NOTED				

SHEET SIZE: 24" X 36" FILE NAME: M:\EO PROJECTS\2020 PROJECTS\14009-20-02 HALE POKAHU ED TELESCOPE\4-DWG\MCHANICAL\M-X.DWG BY: DANIEL HONG



**NOTICES**

1. PROVIDE JACKETING FOR ALL OUTDOOR MOUNTED INSULATED PIPING. PAINT TO MATCH FINISH COLOR OF ADJACENT SUBSTRATE.
2. CONTRACTOR SHALL CONSULT WITH MFR. FOR SIZING AND INSTALLATION OF REFRIG. PIPING (TYP.)
3. ALL THERMOSTATS SHALL BE MOUNTED AT MAX. +48" A.F.F. TO THE TOP OF CONTROL DEVICE PLATE. INSTALLATION AND MOUNTING HEIGHTS SHALL CONFORM TO ADAAG 2010.
4. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO START OF WORK.
5. PROVIDE CLEAN OUTS FOR ALL CHANGES IN DIRECTION FOR CONDENSATE PIPING
6. PENETRATION THROUGH STRUCTURAL ELEMENTS, SHALL BE AVOIDED.

**NOTES**

- ① PROVIDE 6" CONCRETE MAINTENANCE PAD. EXTEND 6" MIN. AROUND ALL UNITS ON ALL SIDES, SLOPE TO REPEL WATER. VERIFY FINAL DIMENSIONS WITH FINAL SELECTED EQUIPMENT.
- ② REFRIG. PIPING ON GRADE. CONSULT WITH MFR. FOR PROPER SIZING AND INSTALLATION. (TYP.)
- ③ REFRIG. PIPING UNDER DECK. CONSULT WITH MFR. FOR PROPER SIZING AND INSTALLATION. (TYP.)
- ④ PROVIDE MOUNTING BRACKET FOR FC-1 TO PROPERLY MOUNT ONTO CURVED WALL.
- ⑤ COND. PIPING UNDER DECK
- ⑥ COND. PIPING BELOW GRADE.
- ⑦ INSTALL PORTABLE DEHUMIDIFICATION UNIT INSIDE DOME. PROVIDE VIBRATION ISOLATION TO MITIGATE VIBRATION TO THE STRUCTURE. UNIVERSITY TO DETERMINE IF UNIVERSITY FURNISHED OR CONTRACTOR FURNISHED. FINAL LOCATION/SPECIFICATIONS OF PORTABLE DEHUMIDIFICATION UNIT TO BE DETERMINED BY UNIVERSITY.
- ⑧ TIE PORTABLE DEHUMIDIFICATION UNIT CONDENSATE DRAIN TO FC-1 CONDENSATE DRAIN.

**A PARTIAL AIR CONDITIONING AND VENTILATION PLAN**  
SCALE: 1/4" = 1'-0"



REVISION NO.	SYMBOL	DESCRIPTION	SHT. ____ OF ____	DATE
		UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII		
		<b>New Educational Telescope</b> University of Hawaii at Hilo		
		PARTIAL AIR CONDITIONING AND VENTILATION PLAN		
		ENGINEERING PARTNERS, INC.		
DESIGNED BY: <b>DH</b>		CHECKED BY: <b>EW</b>		PROJECT NO. <b>UHH-16061</b>
DRAWN BY: <b>DH</b>		APPROVED BY: <b>NYT</b>		DATE <b>NOV. 2021</b>
SCALE: AS NOTED				SHEET <b>M-11</b> OF <b>19</b> SHTS

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

### GENERAL ELECTRICAL SPECIFICATIONS

- DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK.
- THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE. INSTALL CONDUIT RUNS AS SPECIFIED WITH SCHEMATIC REPRESENTATION INDICATED ON THE DRAWINGS AND AS SPECIFIED.
- WHERE CONDUITS ARE SHOWN AS "HOME RUNS" ON THE CONTRACT DRAWINGS, OR STATED TO BE FURNISHED, BUT NOT EXPLICITLY SHOWN AS PART OF THE SCOPE OF WORK, THE CONTRACTOR SHALL PROVIDE ALL CONDUITS, FITTINGS, BOXES, WIRING, CONDUIT SEALS, ETC., AS REQUIRED FOR COMPLETION OF THE RACEWAY SYSTEM IN COMPLIANCE WITH THE NEC AND THE CONTRACT DOCUMENTS.
- MODIFY CONDUIT RUNS TO SUIT FIELD CONDITIONS, AS ACCEPTED BY THE OWNER'S REPRESENTATIVE.
- FINAL CONNECTIONS & ROUGH-IN REQUIREMENTS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
- CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL, MECHANICAL AND OTHER DRAWINGS PRIOR TO BID.
- CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED. CONTRACTOR SHALL REPORT DISCREPANCIES TO THE ARCHITECT AND INCLUDE IN ITS BID ALL COSTS REQUIRED TO MAKE HIS WORK MEET EXISTING CONDITIONS.
- WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
- WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES AND ORDINANCES.
- ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.
- PROVIDE PERMITS AND INSPECTIONS REQUIRED.
- GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USAGE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO THE OWNER.
- PROVIDE RECORD DRAWINGS TO THE OWNER'S REPRESENTATIVE. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.
- VERIFY EXACT LOCATION AND ELECTRICAL CHARACTERISTICS OF EQUIPMENT TO BE FURNISHED BY OTHER DISCIPLINES PRIOR TO ROUGH-IN.
- SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO COST TO OWNER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
- CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS OR EQUIPMENT.
- SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION. LIGHTS, SWITCHES, RECEPTACLES, MOTORS, ETC., SHALL BE CONNECTED AND OPERABLE.
- PRESENT SUBMITTAL DATA AT ONE TIME BOUND IN PDF FORMAT OR PER THE OWNER'S REQUIREMENTS. SUBMITTALS SHALL BE INDEXED IN A NEAT AND ORDERLY MANNER. PARTIAL SUBMITTALS WILL NOT BE ACCEPTED. SUBMITTALS SHALL INCLUDE ALL EQUIPMENT SPECIFIED UNDER THIS PROJECT. SHOULD CONTRACTOR FAIL TO PROVIDE SUBMITTALS, CONTRACTOR PROCEEDS AT ITS OWN RISK AND ANY COST FOR CORRECTIVE WORK WILL BE BORNE BY THE CONTRACTOR.
- PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. FIRESTOP ALL PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE.
- PROTRUDING OBJECTS SHALL COMPLY WITH ADAAG 307. WALL MOUNTED FIXTURES OR SIMILAR WALL MOUNTED DEVICES SHALL NOT PROTRUDE MORE THAN 4" HORIZONTALLY INTO THE CIRCULATION PATH, OR OTHERWISE SHALL BE INSTALLED 80" MINIMUM TO THE BOTTOM OF THE FIXTURE.

### ELECTRICAL SYMBOLS

	ELECTRICAL DEMOLITION. REMOVE EQUIPMENT AND APPURTENANCES IN THEIR ENTIRETY U.N.O. COORDINATE WORK RESTRICTIONS PRIOR TO DEMOLITION.		LUMINAIRE IDENTIFICATION A = LUMINAIRE DESIGNATION (UPPERCASE) a = SWITCH DESIGNATION (LOWER CASE)
	HOMERUN CONDUIT - STROKES INDICATE QUANTITY OF CONDUCTORS		LAY-IN/RECESSED TROFFER
	CONDUIT/WIRE CONCEALED IN WALL OR ABOVE CEILING EXCEPT IN EXPOSED STRUCTURE AREAS 1/2"-2 #12 & 1 #12 GND THWN U.N.O.		SURFACE MOUNT TROFFER
	CONDUIT AND/OR WIRE BELOW FLOOR OR GRADE 3/4"-2 #12 & 1 #12 GND THWN UNLESS NOTED		SUSPENDED LUMINAIRE
	EXISTING CONDUIT AND/OR CONDUCTORS TO REMAIN (SHOWN LIGHT)		DOWNLIGHT LUMINAIRE
	OVERHEAD POWER LINES		WALL MOUNTED LUMINAIRE
	CONDUIT RISER UP/DOWN		EMERGENCY BATTERY LIGHTING UNIT WITH TWIN HEADS
	CONDUIT STUB OUT		EMERGENCY BATTERY LIGHTING UNIT WITH TWIN HEADS AND EXIT SIGN
	SINGLE POLE SWITCH @ +48" TO TOP UNLESS NOTED a = DEVICE SWITCH IDENTIFICATION (LOWERCASE)		SURFACE MOUNTED PANELBOARD
	IF b: 2 = 2 POLE SWITCH      D = DIMMER SWITCH 3 = 3-WAY SWITCH      M = MOTION SENSOR SWITCH 4 = 4-WAY SWITCH      T = THERMAL OVERLOAD SWITCH		FLUSH MOUNTED PANELBOARD
	WALL MOUNTED DUPLEX RECEPTACLE @ +18" TO CENTER U.N.O. = GFCI RECEPTACLE = DOUBLE DUPLEX RECEPTACLE		MAIN SWITCHBOARD, MOTOR CONTROL CENTER OR DISTRIBUTION BOARD
	IF a: C = RECEPTACLE INSTALLED ABOVE COUNTER H = RECEPTACLE INSTALLED HORIZONTALLY		CONCRETE PULLBOX WITH HEAVY DUTY STEEL TRAFFIC COVER
	IF b: MOUNTING HEIGHT IN INCHES TO TOP OF RECEPTACLE		UTILITY PULLBOX
	FLOOR MOUNT RECEPTACLE		METER
	CEILING MOUNT RECEPTACLE		NON-FUSED DISCONNECT SWITCH
	SPECIAL RECEPTACLE @ +18" TO CENTER UNLESS NOTED		FUSED DISCONNECT SWITCH
	CEILING MOUNTED MOTION SENSOR		JUNCTION BOX, IF a: FS = FIRE/SMOKE DAMPER CONNECTION CF = CEILING FAN S = SIGNAGE WH = WATER HEATER
	PHOTOCELL (INSTALL ON ROOF FACING NORTH)		COMBINATION METER/MAIN
	IF a: R = RELAY                      CB = CIRCUIT BREAKER C = CONTACTOR              TS = TIMESWITCH P = POWER SUPPLY          PB = PUSH BUTTON TYPE CONTROL STATION		FUSIBLE SWITCH
	TELEPHONE/DATA OUTLET (X) 4-PAIR CAT-6 CABLES (TYPE 'H') PROVIDE CORRESPONDING FACEPLATE WITH QTY OF PORTS AS REQUIRED, WHERE "X" INDICATED NUMBER OF PORTS.		SINGLE METER WITH CT,
			CIRCUIT BREAKER
			MOTOR LOAD
			GROUND BUS & GROUND ELECTRODES
			TRANSFORMER (SIZE AND CLEARANCES BASED ON KVA RATING)
			TRANSFORMER

### ELECTRICAL ABBREVIATIONS

+18"	INDICATES MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE AFF OR AFG	LO	LUGS ONLY (SEE ALSO MLO)
AF	AMP FUSE (FOR FUSES), AMP FRAME (FOR CIRCUIT BREAKERS)	MCB	MAIN CIRCUIT BREAKER
AFF	ABOVE FINISHED FLOOR	MLO	MAIN LUGS ONLY
AFG	ABOVE FINISHED GRADE	NEC	NATIONAL ELECTRICAL CODE, AS ADOPTED BY THE AHJ
AHJ	LOCAL AUTHORITY HAVING JURISDICTION	P	POLE
AT	AMP TRIP	PH	PHASE
C	CONDUIT	PNL	INDICATES PANEL
CU	COPPER	TYP	TYPICAL
CW	COLD WATER PIPE	UPS	UNINTERRUPTIBLE POWER SYSTEM
FACP	FIRE ALARM CONTROL PANEL	WP	WEATHER-PROOF (NEMA 3R)
AFCI	INDICATES ARC FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL	XFMR	TRANSFORMER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL	UNO	UNLESS NOTED OTHERWISE
GFP	GROUND FAULT PROTECTION	(D)	DEMOLITION
GND	GROUND	(E)	EXISTING
HELCO	ELECTRICAL UTILITY COMPANY	(N)	NEW
IWP	IN-USE WEATHER-PROOF (NEMA 3R)	(R)	RELOCATE/RELOCATED

**HAWAII COUNTY ENERGY CODE**  
**2018 IECC, HAWAII REVISED STATUTES HRS 107-24 TO 28 & HAWAII ADMINISTRATIVE RULES CHAPTER HAR 3-181.1**

**COMMERCIAL BUILDING ENERGY EFFICIENCY STANDARDS**

I CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THIS PROJECTS DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY EFFICIENCY STANDARDS PERTAINING TO THE COMMERCIAL PROVISIONS FOR ELECTRICAL & LIGHTING SYSTEMS (C405, & C408) OF THE 2015 IECC WITH AMENDMENTS PER HAR 3-181.1:

COMPLIANCE METHOD			
	2015 IECC AS AMENDED. MANDATORY AND PRESCRIPTIVE	2015 IECC AS AMENDED. MANDATORY AND TOTAL BUILDING PERFORMANCE	ASHRAE STANDARD 90.1-2013. MANDATORY AND PRESCRIPTIVE
INFORMATION IN CONSTRUCTION DOCUMENTS			
	YES	N/A	
<b>INTERIOR LIGHTING</b>			
OCCUPANT SENSOR CONTROLS	C405.2.1		X
TIME SWITCH CONTROLS	C405.2.2		X
DAYLIGHT RESPONSIVE CONTROLS	C405.2.3		X
DAYLIGHT ZONES ON PLANS	C405.2.3.2 & C405.2.3.3		X
GUEST ROOM CONTROLS	C405.2.4		X
INTERIOR LIGHTING FIXTURE SCHEDULE			X
INPUT POWER FOR INTERIOR LIGHTING FIXTURES	C405.4.1		X
INTERIOR LIGHTING FIXTURE LOCATIONS	C403.2.8		X
LIGHTING CONTROL FUNCTIONAL PERFORMANCE			X
TESTING REQUIREMENT	C408.3		X
<b>EXTERIOR LIGHTING</b>			
EXTERIOR LIGHTING CONTROLS	C405.2.5		X
EXTERIOR LIGHTING FIXTURE SCHEDULE			X
INPUT POWER FOR EXTERIOR LIGHTING FIXTURES			X
EXTERIOR LIGHTING FIXTURE LOCATIONS			X
<b>ELECTRICAL</b>			
ELECTRICAL TRANSFORMER EFFICIENCY	C405.7		X
TENANT SUBMETERING	C405.10		X

NOTES:

SIGNATURE: _____  
DATE: 10/30/2021  
NAME: ELI B. WALTZ  
TITLE: ELECTRICAL ENGINEER  
LICENSE NO.:18572-E

REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE

UNIVERSITY OF HAWAII AT HILO  
STATE OF HAWAII

**New Educational Telescope**  
University of Hawaii at Hilo

ELECTRICAL SYMBOLS, IECC, & ABBREVIATIONS

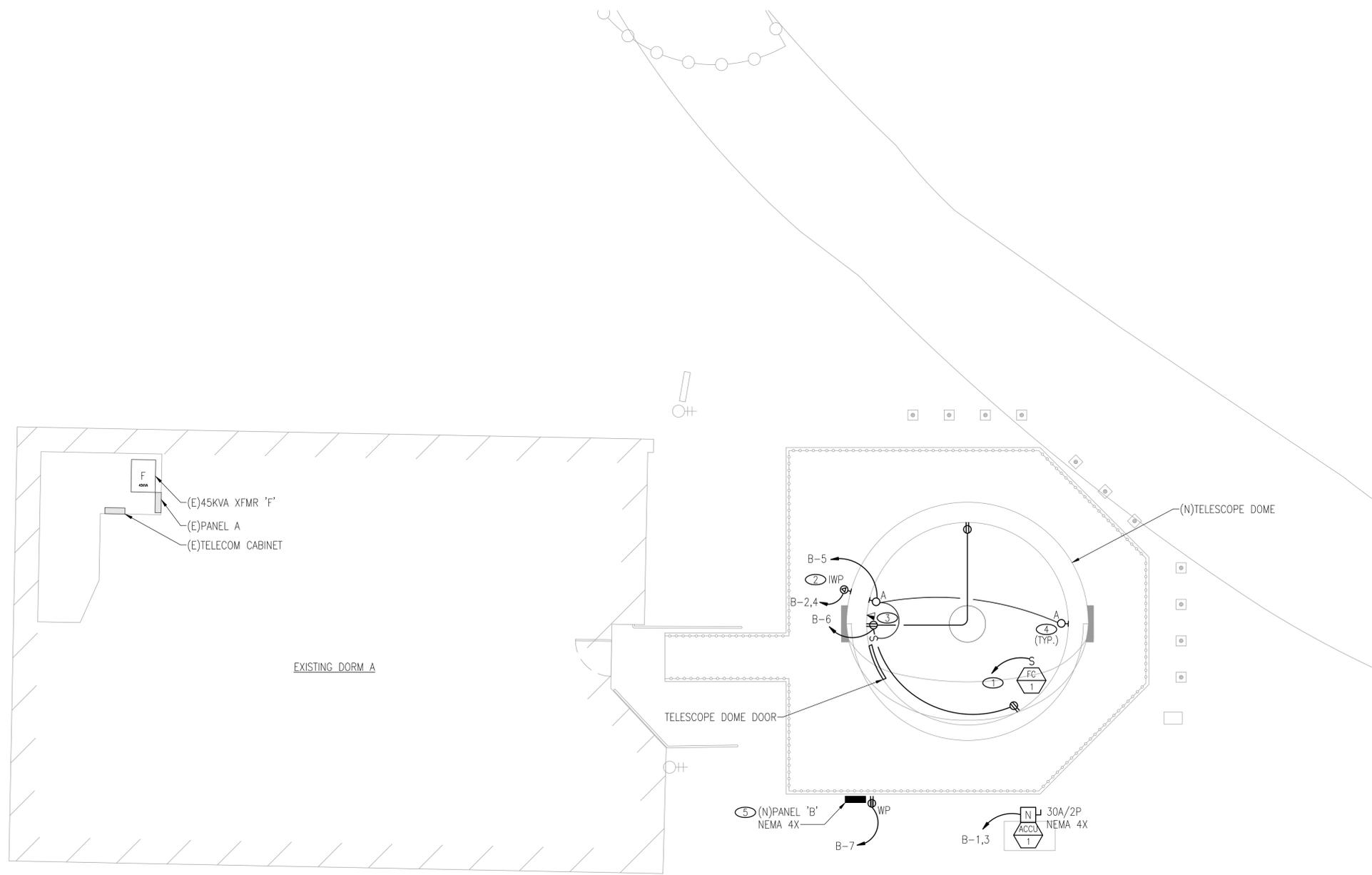
**ENGINEERING PARTNERS, INC.**

DESIGNED BY: <b>CF</b>	CHECKED BY:	PROJECT NO. <b>UHH-16061</b>	SHEET <b>E-01</b>
DRAWN BY: <b>DF</b>	APPROVED BY:	DATE <b>NOV. 2021</b>	OF <b>19</b> SHTS
SCALE: AS NOTED			

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE _____

SHEET SIZE: 24" X 36" FILE NAME: M:\EO PROJECTS\2020 PROJECTS\14009-20-02 HALE POKAHU ED TELESCOPE\4-DWG\ELECTRICAL-E-DWG BY: CHLOE FRIZELLE



**NOTICES**

1. ROUTE ALL NEW ELECTRICAL ALONG AND UNDER THE NEW DECK.
2. LOCATIONS OF ALL WIRES AND DEVICES TO BE CONFIRMED WITH THE UNIVERSITY.

**NOTES**

- ① POWERED BY ACCU-1. PROVIDE CONNECTION BETWEEN INDOOR UNIT PER MANUFACTURERS INSTRUCTIONS.
- ② PROVIDE AN IN-USE WATER PROOF NEMA 6-20 RECEPTACLE FOR THE POINT OF CONNECTION PROVIDED WITH CLIENT FURNISHED DOME.
- ③ CONNECT DATA OUTLET AT THE HMI/PLC (DEVICE PROVIDED WITH CLIENT FURNISHED DOME) BACK TO EXISTING TELECOM CABINET IN ELECTRIC ROOM.
- ④ PLACE WALL MOUNTED LIGHTS ON STATIONARY RING OF NEW TELESCOPE DOME. COORDINATE FINAL LOCATION WITH CLIENT.
- ⑤ LOCATE ON INDEPENDENT SUPPORT SEE DETAIL 2/E-1.2.

**A OVERALL ELECTRICAL PLAN**  
 SCALE: 1" = 5'

REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
<b>New Educational Telescope</b> University of Hawaii at Hilo				
OVERALL ELECTRICAL PLAN				
ENGINEERING PARTNERS, INC.				
DESIGNED BY: CF		CHECKED BY:		PROJECT NO. UHH-16061
DRAWN BY: DF		APPROVED BY:		DATE NOV. 2021
SCALE: AS NOTED				SHEET E-11 OF 19 SHTS



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

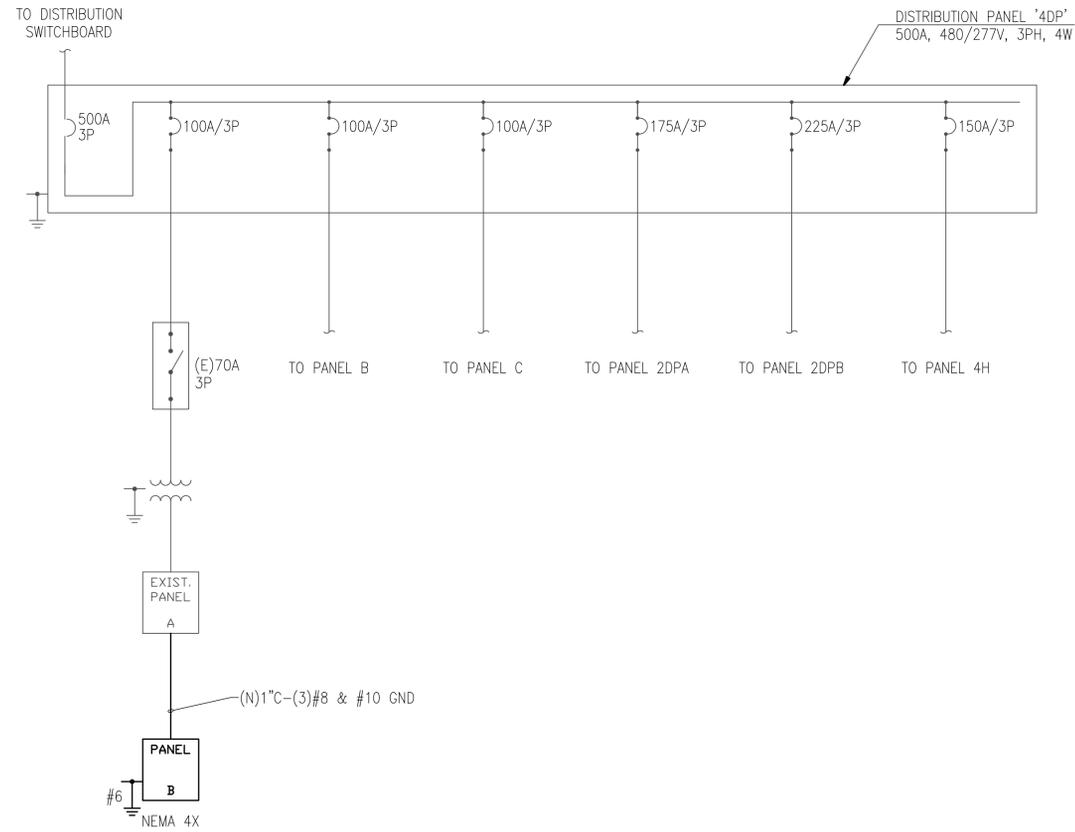
SHEET SIZE: 24" X 36" FILE NAME: M:\EO PROJECTS\2020 PROJECTS\14009-20-02 HALE POKAHU ED TELESCOPE\4-DWG\ELECTRICAL\X-DWG BY: CHLOE.FRIZELLE

**EXISTING**

PANEL: A		VOLTAGE: 208 / 120 3Ø 4W	CIRCUIT CODE: blank or	N: NON-CONTINUOUS																			
DATE: 1/10/22 4:22 PM		BUS: 225A	L: LONG-CONTINUOUS																				
JOB: 14009-20-02		MAINS: 150A M.C.B.	R: DEMANDABLE RECEPTACLES																				
		LOCATION: JANITOR CLOSET	K: KITCHEN	NO. OF EQUIPMENT: 0																			
TRIP	POLE	DESCRIPTION (NOTE)	M	R	L	ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	(NOTE)	DESCRIPTION	TRIP	POLE	CODE	ØC NO.
1	20	1 LIGHTS - RMS. 3&4	2			500						500						2	LIGHTS & RECEPTS.-RM 5&6	20	1		2
3	20	1 LIGHTS - RMS. 16,17,18&19	2				500						500					2	LIGHTS & RECEPTS.-RM 7&8	20	1		4
5	20	1 LIGHTS - RMS. 12,13,14&15	2					500						500				2	LIGHTS & RECEPTS.-RM 9&10	20	1		6
7	20	1 RECEPT.-RMS. 3&4, JANITORS	2											500				2	RECEPT. - RM 19	20	1		8
9	20	1 SPARE	2												1000			2	RECEPT. - RM 16 (19/REF)	20	1		10
11	50	1 RANGE RM. 16	2															2	RECEPT. - RM 16(COUNTER)	20	1		12
13	50	1 RANGE RM. 15	2				2000											2	RECEPT. - RM 12&15(REF)	20	1		14
15	50	1 RANGE RM. 15	2					2000										2	RECEPT. - RM 12	20	1		16
17	30	1 HEAT TRACE H-50-2	2											500				2	RECEPT. - RM 15(COUNTER)	20	1		18
19	30	1 HEAT TRACE H-50-2	2				500								500			2	HEAT TRACE FPS (COLD WATER)	20	1		20
21	30	1 HEAT TRACE H-50-2	2												500			2		20	1		22
23	30	1 HEAT TRACE 3H50-6T	2															2	COMMON BLDG. WASHER/DRYER	30	2		24
25	2	1					500								1000			2		2	2		26
27	20	1 DISPOSER.-RM. 16	2												3012			1	PANEL B	40	1		28
29	20	1 DISPOSER.-RM. 15	2												1770			1		2	2		30
31																							32
33																							34
35																							36
37																							38
39																							40
41																							42
PANEL NOTES:						PHASE TOTALS			ØA: 7500	ØB: 9012	ØC: 9770	TOTAL CONNECTED VA			26282								
1. PROVIDE NEW BREAKER. MATCH PANEL AIC RATING AND MANUFACTURER.									CONNECTED VA (CODE N)			26282											
2. EXISTING LOADS.									CONNECTED VA (CODE L)			0											
									CONNECTED VA (CODE R)			0											
									CONNECTED VA (CODE K)			0											
									PANEL CONNECTED KVA			26.3											
									PANEL DEMAND KVA			26.3											
									PANEL DEMAND AMPS			73.0											
									HIGH Ø AMPS w/ DEMAND			81.4											
30 CIRCUIT PANEL																							

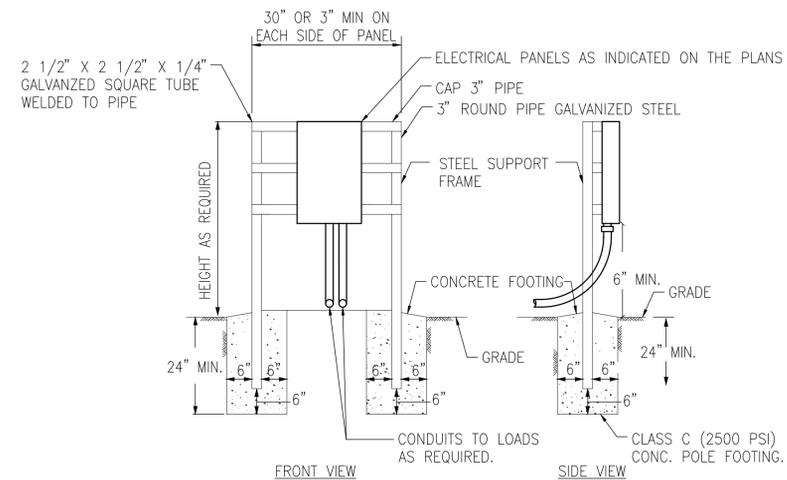
**NEW**

PANEL: B		VOLTAGE: 208 / 120 1Ø 3W	CIRCUIT CODE: blank or	N: NON-CONTINUOUS																			
DATE: 1/10/22 4:16 PM		BUS: 60A	L: LONG-CONTINUOUS																				
JOB: 14009-20-02		MAINS: M.L.G.	R: DEMANDABLE RECEPTACLES																				
		LOCATION: INTERIOR	K: KITCHEN	NO. OF EQUIPMENT: 0																			
TRIP	POLE	DESCRIPTION (NOTE)	M	R	L	ØA	ØB	A	B	ØA	ØB	L	R	M	(NOTE)	DESCRIPTION	TRIP	POLE	CODE	ØC NO.			
1	15	1 ACCU-1 & FC-1				1040				550							1	1			2	2	4
3	20	1					1040			550							1	1			2	2	4
5	20	1 LIGHTS AND RECEPTACLES					562			880							1	1			2	2	6
7	20	1 MAINTENANCE RECEPTACLE						180									1	1			2	2	8
9																							10
11																							12
13																							14
15																							16
17																							18
19																							20
21																							22
23																							24
25																							26
27																							28
29																							30
31																							32
33																							34
35																							36
37																							38
39																							40
41																							42
PANEL NOTES:						PHASE TOTALS			ØA: 3012	ØB: 1770	TOTAL CONNECTED VA			4782									
									CONNECTED VA (CODE N)			4782											
									CONNECTED VA (CODE L)			0											
									CONNECTED VA (CODE R)			0											
									CONNECTED VA (CODE K)			0											
									PANEL CONNECTED KVA			4.8											
									PANEL DEMAND KVA			4.8											
									PANEL DEMAND AMPS			23.0											
									HIGH Ø AMPS w/ DEMAND			25.1											
8 CIRCUIT PANEL, NEMA 4X																							



**1 SINGLE LINE DIAGRAM**  
NO SCALE

LUMINAIRE SCHEDULE							
FIXTURE TYPE	MANUFACTURER		VOLT AMPS	MOUNTING	LAMP TYPE	REMARKS	VOLT
	NAME	CATALOG NUMBER					
A	LITHONIA	FMMCL 840 S1	11	SURFACE	LED	WALL MOUNTED LED SURFACE MOUNTED LIGHT.	120



NOTES: PAINT ALL EXPOSED METAL WITH EXTERIOR RATED ENAMEL PAINT. COLOR BY UNIVERSITY.

**2 EQUIPMENT MOUNTING DETAIL**  
NO SCALE

REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE
UNIVERSITY OF HAWAII AT HILO STATE OF HAWAII				
<b>New Educational Telescope</b> University of Hawaii at Hilo				
ELECTRICAL SCHEDULES & SINGLE LINE DIAGRAM				
ENGINEERING PARTNERS, INC.				
DESIGNED BY: CF	CHECKED BY:	PROJECT NO. UHH-16061	SHEET E-12	
DRAWN BY: DF	APPROVED BY:	DATE NOV. 2021	OF 19 SHEETS	
SCALE: AS NOTED				

**ELI B. WALTZ**  
LICENSED PROFESSIONAL ENGINEER  
Exp. 04/30/22  
No. 18572-E  
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

_____  
SIGNATURE

*This page intentionally left blank.*

# Appendix B

---

Cultural Impact Assessment in Support of the UH Hilo  
Educational Telescope at the Halepōhaku Mid-Level Support  
Facility on Mauna Kea, Hawai'i Island

*This page intentionally left blank.*

REPORT  
Cultural Impact Assessment in Support of the UH Hilo Educational Telescope at the Halepōhaku  
Mid-Level Support Facility on Mauna Kea, Hawai'i Island, Hawai'i

TMK: (3) 4-4-015:012

Prepared For:  
SSFM International  
99 Aupuni Street, Suite 202  
Hilo, Hawaii 96720

Prepared By:  
Pacific Consulting Services, Inc.  
720 Iwilei Road, Suite 424  
Honolulu, HI 96817

Revised January 2022

This Page Left Blank Intentionally

## MANAGEMENT SUMMARY

Document Title:	Cultural Impact Assessment in Support of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea, Hawai'i Island
Date/Revised Date:	Preliminary Draft: December 2020; Draft June 2021; January 2022
Archaeological Permit #:	SHPD Permit No. 22-09
Project Location:	Mauna Kea Mid-Level Support Facility, Ka'ōhe Ahupua'a, Hāmākua District, Island of Hawai'i
Project TMK:	TMK (3) 4-4-015:012
Land Owner:	State of Hawai'i
Project Proponents:	University of Hawaii-Hilo
Project Tasks:	Cultural Impact Assessment
Project Acreage:	1,200 square feet (0.03 acres)
Principal Investigator:	Dennis Gosser, M.A.
Regulatory Oversight:	Hawaii Revised Statutes (HRS) Chapters 343; Adjunct HRS 6E-7 and 6E-8, and Hawaii Administrative Rules (HAR) Chapter 275
Project Background:	The project scope of work includes the construction of the observatory building to house the new UH Hilo Educational telescope
SIHP #:	None
Findings:	Archaeological investigations have documented four historic properties within a 100 meters of the project area; 50-10-23-10314 (pre-Contact lithic scatter), 50-10-23-09074 (historic structure), 50-10-23-09075 (historic structure), and 50-10-23-09076 (historic structure).
Human Skeletal Remains:	None identified within the project area.
	<b>Recommended effect determination:</b> No historic properties affected
	<b>Recommended commitments:</b>
Recommendations:	Because the proposed project will include ground disturbance in an area near where non-contiguous archaeological deposits have been recorded, it is recommended that a commitment be made to monitor (with an SHPD-approved monitoring plan) ground-disturbing activities during construction.

This Page Left Blank Intentionally

**TABLE OF CONTENTS**

MANAGEMENT SUMMARY ..... i

TABLE OF CONTENTS ..... iii

LIST OF FIGURES ..... iii

LIST OF TABLES ..... iii

1.0 INTRODUCTION..... 1

1.1 PROJECT PURPOSE, REGULATORY GUIDANCE, AND AREA OF POTENTIAL EFFECT (APE)..... 1

1.2 METHODS ..... 1

2.0 ENVIRONMENTAL Background..... 4

2.1 SETTING..... 4

2.2 CLIMATE, HYDROLOGY, AND FLORA..... 4

3.0 HISTORICAL BACKGROUND..... 4

3.1 PLACE NAMES, MYTHS, LEGENDS, AND TRADITIONAL HISTORIES ..... 6

3.2 LAND USE ..... 8

3.2.1 PRE-CONTACT PERIOD LAND USE..... 9

3.2.2 POST-CONTACT PERIOD LAND USE..... 10

4.0 PREVIOUS ARCHAEOLOGY..... 11

SIHP SITE 50-10-23-10314..... 13

SIHP SITES 50-10-23-09074, 09075, AND 09076 (THE HALEPŪHAKU REST CAMP AND COMFORT STATION) ... 13

5.0 FIELD SURVEY ..... 13

6.0 CONSULTATION ..... 13

6.1 CONSULTANTS ..... 15

6.2 RESPONSES ..... 17

7.0 POTENTIAL PROJECT CULTURAL IMPACTS AND RECOMMENDATIONS ..... 19

7.1 DETERMINING EFFECTS TO SIGNIFICANT HISTORIC PROPERTIES (HAR §13-275-7) ..... 19

7.2 CONSULTATION ..... 19

7.3 RECOMMENDATIONS ..... 19

8.0 REFERENCES..... 20

**LIST OF FIGURES**

Figure 1 Island of Hawai‘i Showing the District, Ahupua‘a, Mauna Kea Science Reserve, Natural Area Reserve, and Project Location..... 2

Figure 2 Halepōhaku Mid-Level Facility Showing Proposed Location APE for the New Teaching Telescope (Red Box) ..... 3

Figure 3. The Summit Plateau Looking Northeast with Pōhakoloa Gulch in the Foreground, Pu‘u Kūkahau‘ula (summit) at the top center, and Pu‘u Makanaka in the Distance. .... 5

Figure 4. Map Titled *Kaohe and Humuula Hawaii Government Survey Map by C.J. Lyons 1891* (Hawaii State Archives Registered Map 1641). ..... 7

Figure 5. Location of Previous Archaeological Projects. .... 12

Figure 6. Extent of Field Inspection and Approximate APE. .... 14

Figure 7. Screen Capture of the December 2021 Public Notice Published in the *Ka Wai Ola* Newsletter. 18

**LIST OF TABLES**

Table 1. List of Agencies, Groups, and Individuals Invited to Consult ..... 15

This Page Left Blank Intentionally

## 1.0 INTRODUCTION

Under contract to SSFM, International (SSFM), Pacific Consulting Services, Inc. (PCSI) has prepared this Cultural Impact Assessment (CIA) in support of the proposed location of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea¹, Ka'ōhe Ahupua'a, Hāmākua District, Island of Hawai'i (Figures 1 and 2). The project proponent is the University of Hawai'i-Hilo (UHH). The 19.3-acre Halepōhaku Mid-Level Support Facility is leased from the State of Hawaii and managed by the University of Hawai'i (CDUP No. HA-1819, Tax Map Key [3] 4-4-15:12) and includes modern buildings housing offices and dormitories, the Onizuka Center for International Astronomy (OCIA), the Visitor Information Station (VIS), and several historic buildings.

The new educational telescope facility at Halepōhaku will replace the Hōkū Ke'a Observatory (planned for decommissioning) located at the summit. This new telescope will be used by students for training in modern astronomical observing techniques, developing skills in scientific research, and communicating science to the general public.

### 1.1 PROJECT PURPOSE, REGULATORY GUIDANCE, AND AREA OF POTENTIAL EFFECT (APE)

The purpose of developing this CIA was to gather together information concerning historic properties, cultural resources, and traditional practices that may be impacted by the proposed UH Hilo Educational Telescope at Halepōhaku. The CIA was prepared pursuant to Act 50² (House Bill No. 2895, signed into law on 26 April 2000), and in accordance with the Office of Environmental Quality Control (OEQC) "*Guidelines for Assessing Cultural Impact*," (adopted by the State of Hawai'i Environmental Council on 19 November 1997). The CIA was also prepared in accordance with Hawai'i Revised Statute (HRS) Chapter 343 (Environmental Impact Statements), which serves to "...ensure that environmental concerns are given appropriate consideration in decision making..." (HRS Chapter 343-1).

In addition to the regulatory statutes noted above, the current study draws upon HRS Chapter 6E-8 as well as Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division Rules), Chapter 275: (*Rules Governing Procedures for Historic Preservation Review for Governmental Projects*) for pertinent definitions and methodologies concerning historic properties and cultural resources.

The proposed project activities include:

- Construction of an observatory building to house the telescope and associated equipment; and
- Conduit trench excavations for utilities servicing the telescope.

The Area of Potential Effect (APE) is approximately 1,200 square feet (0.03 acres) bounded on the west by Halepōhaku Dorm "A," on the north and east by a graded access road, and arbitrarily on the south (see Figure 2).

### 1.2 METHODS

Understanding the cultural setting of an area includes compiling and analyzing archival, historical, and traditional information from many sources. In addition to written or published sources, identifying and inviting individuals and groups to share their knowledge relating to traditional practices and beliefs is important to developing a well-rounded, informed, understanding of a proposed project's cultural setting.

---

¹ Where applicable, geographic names follow the Hawaii Geographic Names Board Place Names (October 2018).

² Section 1 of Act 50 states that the preparation of environmental assessments...should identify and address effects on Hawaii's culture, and traditional customary rights and notes that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the 'aloha spirit' in Hawai'i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups."

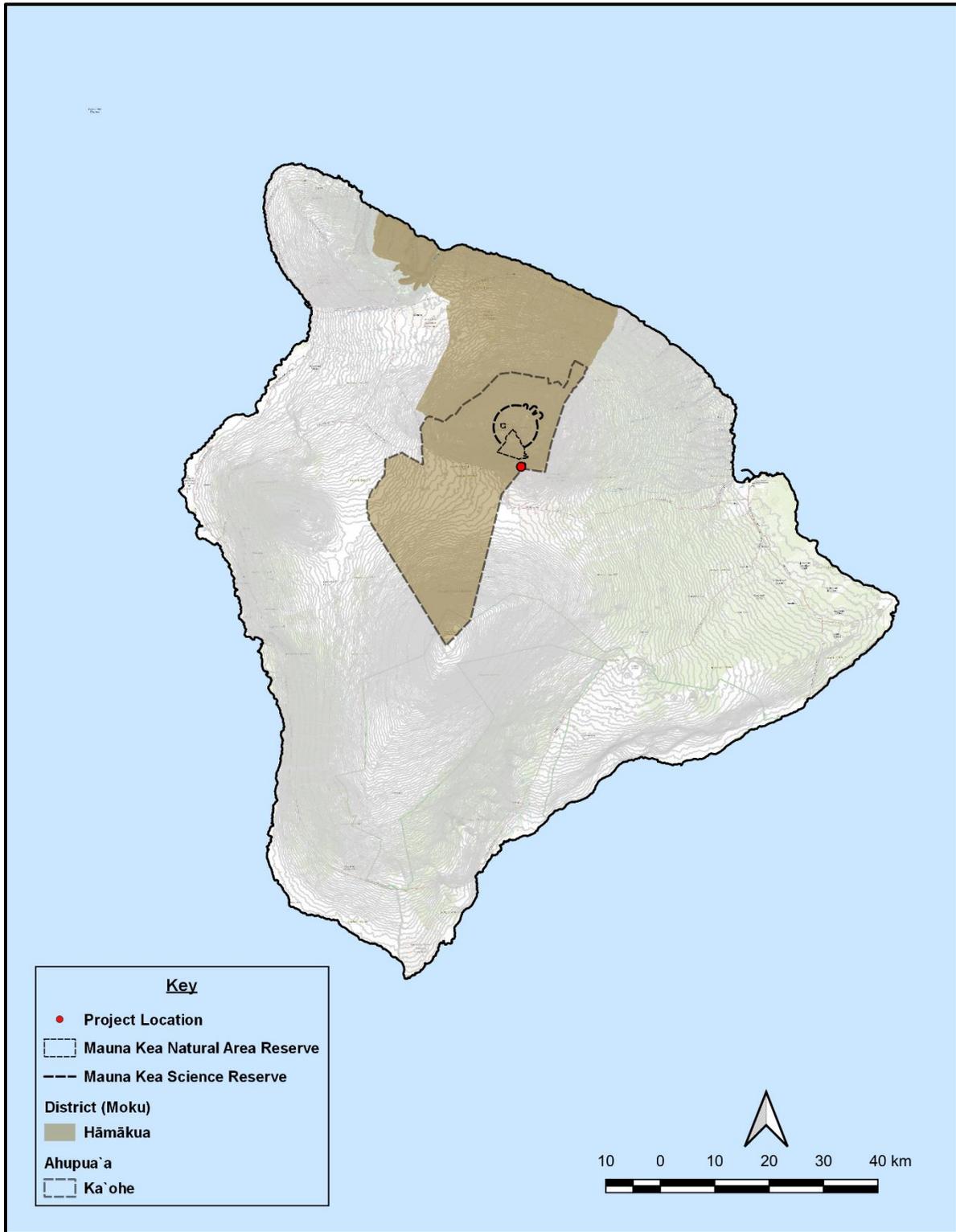


Figure 1 Island of Hawai'i Showing the District, Ahupuaʻa, Mauna Kea Science Reserve, Natural Area Reserve, and Project Location.

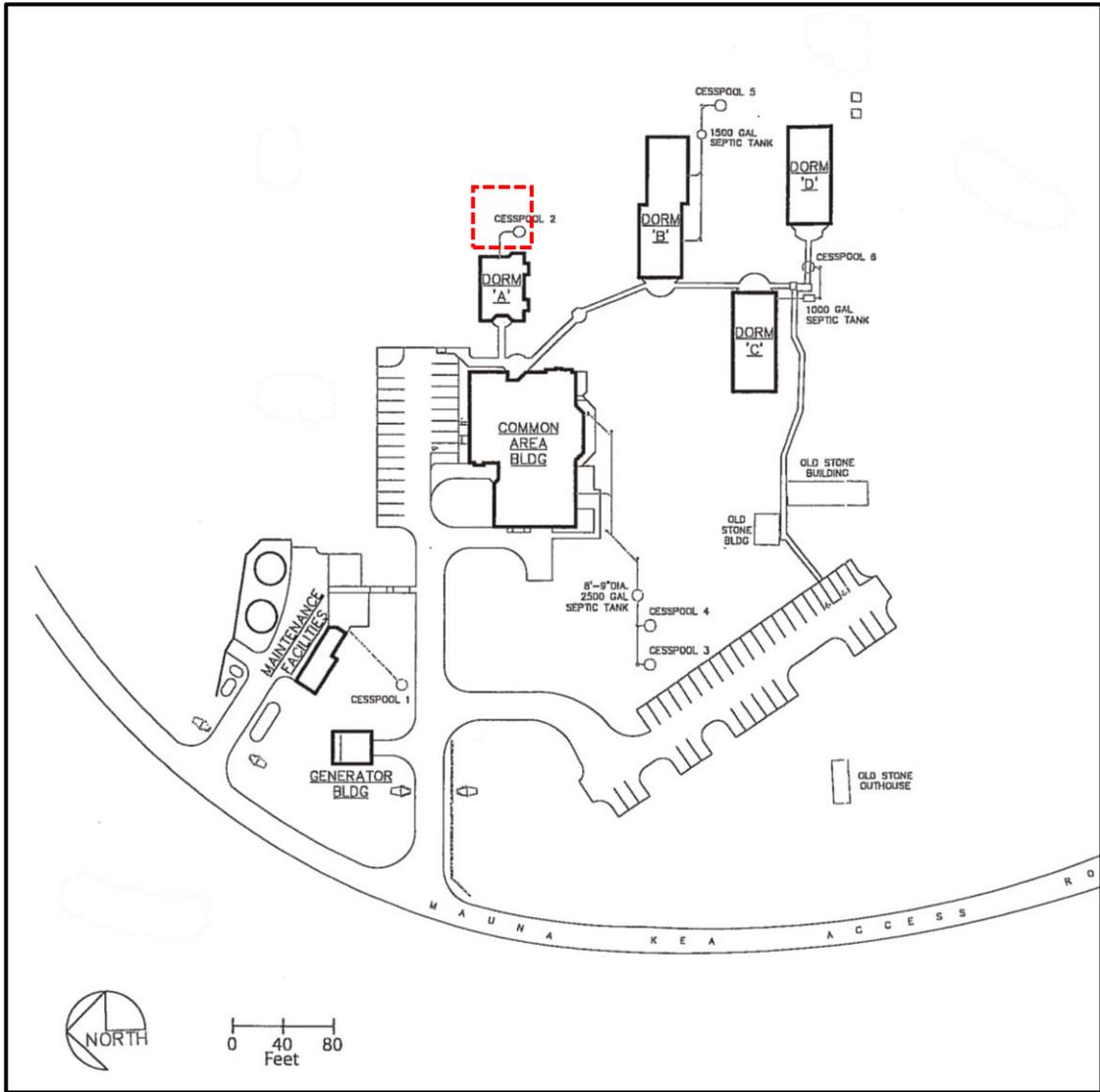


Figure 2 Halepōhaku Mid-Level Facility Showing Proposed Location APE for the New Teaching Telescope (Red Box)

Prior to contacting and consulting³ with interested parties familiar with and knowledgeable of Mauna Kea's cultural traditions, PCSI staff conducted a historical and archaeological literature review of the Halepōhaku project area in order to assess any potential effect on historic properties or other cultural resources. The background research was completed using various documentary and archival resources, including the State Historic Preservation Division's (SHPD) database of archaeological reports, the SHPD report library, a Land Commission Awards (LCA) review via the Bureau of Conveyances, a review of historic maps, and a review of Mauna Kea reports on file at PCSI. Because the project area has been the subject of several archaeological studies, including an SHPD-approved archaeological inventory survey (AIS; McCoy and Nees 2010), no ground-disturbing archaeological activities (e.g., archaeological excavations) have been undertaken or are being considered as part of the current project.

Finally, consultation letters for this CIA were sent to a broad spectrum of the community (e.g., organizations, government agencies, and individuals) for input. In addition, an invitation to participate was published in the Office of Hawaiian Affairs' Ka Wai Ola newsletter in December 2021. The results of the consultation are presented below.

## 2.0 ENVIRONMENTAL BACKGROUND

### 2.1 SETTING

Mauna Kea is the highest (4,205 m⁴ [13,796 ft] above sea level [asl]) and second largest of the five shield volcanoes forming the island of Hawai'i and is between 600,000 and 1.5 million years old (DePaolo and Stolper 1996; Moore and Clague 1992; Sharp and Rene 2005; Wolfe et al. 1997) (Figure 3). The oldest stage of volcanism consists of a basaltic shield called the Hāmākua Volcanic Series (Stearns and Macdonald 1946) or the Hāmākua Group (Porter 1979). The most recent stage of volcanism consists of andesitic lavas (Macdonald and Abbott 1970:142; Sherrod et al. 2007; Wolfe and Morris 1996; Wolfe et al. 1997) called the Laupāhoehoe Volcanic Series (Stearns and Macdonald 1946) or the Laupāhoehoe Group (Porter 1979). Even though the last eruption occurred sometime between 4,580 and 8,200 years ago (Sherrod et al. 2007:470), the U.S. Geological Survey (USGS) considers Mauna Kea to be an active post-shield volcano (U.S. Geological Survey 2002).

### 2.2 CLIMATE, HYDROLOGY, AND FLORA

The climate at Halepōhaku is dry and cool, with an annual mean rainfall of approximately 25 inches (635 millimeters) and a temperature range of between 30° and 70°F (Giambelluca et al. 2014). Precipitation in the form of snow is rare at Halepōhaku. Prevailing winds are from the northeast. There are no permanent streams on the south flank of Mauna Kea, and the nearest sources of permanent water are springs and seeps located in Waikahalulu Gulch (Wentworth and Powers 1943). The summit region is dry and cold with little difference in the mean minimum and mean maximum temperature ranges throughout the year. Precipitation at the summit averages approximately 204 mm (8.0 inches) per year ( ). Prevailing winds at the summit are from the east-northeast.

Halepohaku is situated at the transitional zone between two overlapping vegetation communities: sub-alpine xerophytic scrubland and the *mamane* (*Sophora chrysophyllia*) parkland. The scrubland is characterized by *pukiawe* (*Styphella tameiameia*), *noho-anu* (*Geranium cuneatum*), *'ohelo* (*Vaccinium reticulatum*), and *na'ena'e* (*Raillardia ciliolate*). The parkland is dominated by *mamane* and *'aheahea* (*Chenopodium oahuense*)

## 3.0 HISTORICAL BACKGROUND

McEldowney (1982), Langlas (Langlas et al. 1997; Langlas 1999), Maly (Maly 1998, 1999; Maly and Maly 2005), and McCoy and Nees (2010) have summarized the traditional culture history, traditions, historical accounts, oral histories, and spiritual significance of Mauna Kea's summit region through early journal accounts, maps, ethnographic collections, Boundary Commission testimonies, and oral interviews.

---

³ Because of State and County imposed restrictions due to the COVID-19 pandemic, consultation for this project relied solely on USPS mail, email, and other electronic means.

⁴ Metric abbreviation use and style follow the Society for American Archaeology American Antiquity Style Guide (2018).

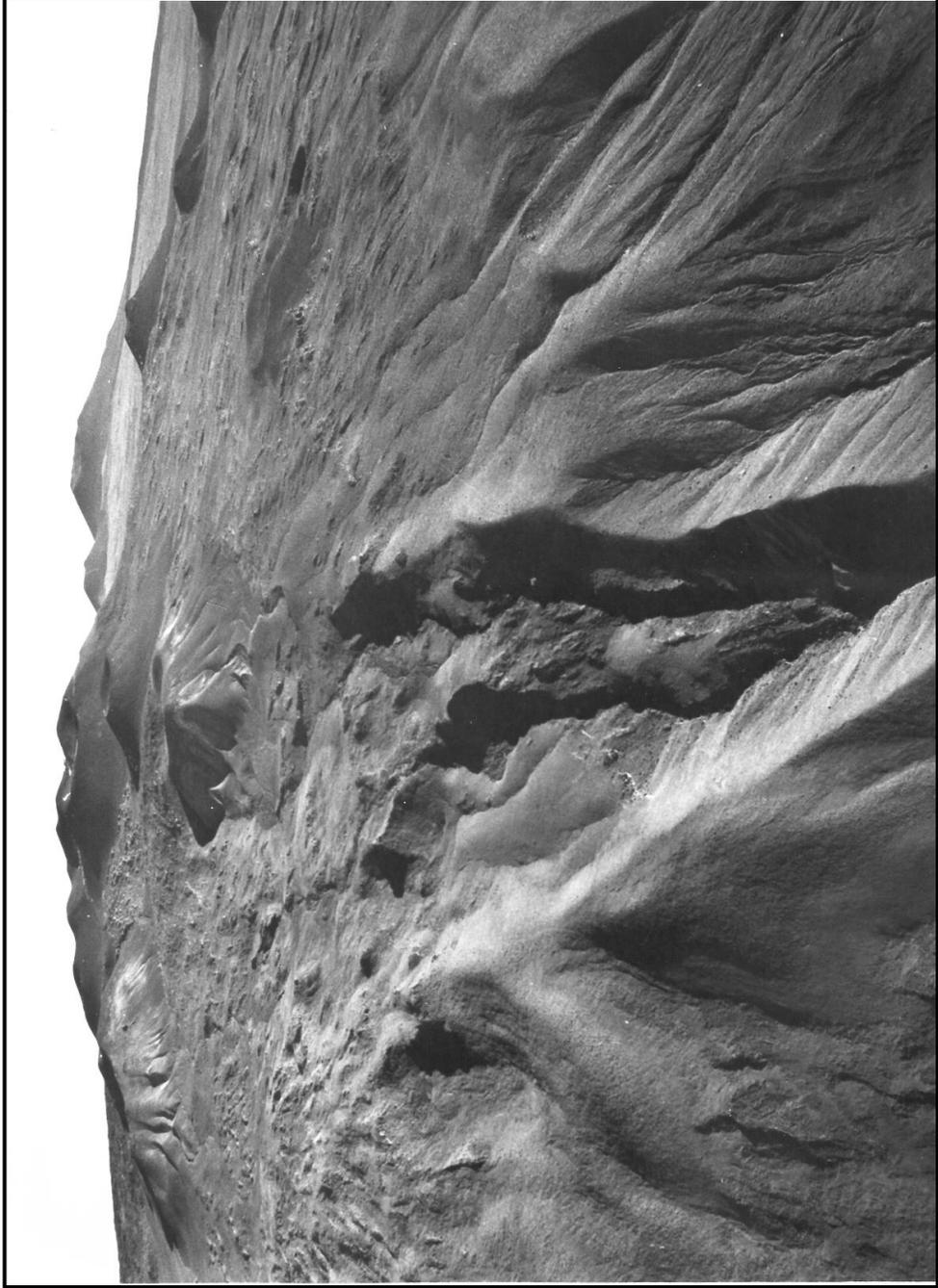


Figure 3. The Summit Plateau Looking Northeast with Pōhakoloa Gulch in the Foreground, Pu'u Kūkahau'ūla (summit) at the top center, and Pu'u Makanaka in the Distance.

McCoy and Nees (2010) summarized the cultural history and previous archaeological work on Mauna Kea. The overview that follows is based on these studies, which should be consulted for more detail.

### 3.1 PLACE NAMES, MYTHS, LEGENDS, AND TRADITIONAL HISTORIES

Place names in the Mauna Kea summit region are a mix of traditional and modern nomenclature. Mauna Kea has been interpreted literally as White (Kea) Mountain (Mauna), but also as a reference to the union between the gods Wākea and Papa that formed the mountain (Ellis 1979:292). In an account and *mele* of Queen Emma's trip to Lake Waiau in 1881 or 1882, de Silva and de Silva (2007) present details about the names of the mountain and Lake Waiau:

Although Maunakea is popularly translated as “white mountain,” Kea is also an abbreviated form of Wakea, the sky father who, with Papa, the earth mother, stands at the apex of Hawaiian genealogy. Mauna Wakea is thus viewed traditionally as the sacred meeting point of sky and earth, father and mother, Wakea and Papa. Emma's poets were well-acquainted with the older name and its lasting significance; they refer to Waiau as “ka piko on Wakea”—as the mountain's navel/genital/umbilical/connecting-point/center (de Silva and de Silva 2007: footnote 7).

The currently used name for the summit is Kūkahau'ūla (“Kūkahau'ūla of the red-hewed dew or snow”), instead of the formerly used Pu'u Wekiu, and refers to the legendary husband of Līlīnoe and an 'aumakua (family deity) of fishermen (Hibbard 1999). Maly and Maly (2005:vi) give the name as Pu'u o Kūkahau'ūla, which they say was “named for a form of the god Ku, where the *piko* of new-born children were taken to insure long life and safety.” According to Maly and Maly (2005:vi):

The name Pu'u of Kukahau'ūla is the traditional name of the summit cluster of cones on Mauna Kea, appearing in native accounts and cartographic resources until c. 1932. The recent names, Pu'u Wekiu, Pu'u Hau'oki and Pu'u Haukea, have...been used since the 1960s (since the development of astronomy on Mauna Kea), and have displaced the significant spiritual and cultural values and sense of place associated with the traditional name, Pu'u o Kukahau'ūla.

The names Kūkahau'ūla and Līlīnoe are both attributed to cinder cones in the summit region: Kūkahau'ūla at the summit and Līlīnoe immediately southeast of the summit cluster. These names, along with that of Waiau, appear on Lyon's 1884 sketch map (Figure 4), and Līlīnoe and Waiau are repeated in the survey of the summit region conducted in 1892 by Alexander. Kūkahau'ūla is given as the name of “the highest peak” even earlier in 1873 land boundary testimonies. Of the place names in the summit region, these three are applied the earliest and most consistently to specific landmarks on the mountain. In compiling the 1892 map of Mauna Kea, W.D. Alexander refers to these as “genuine native names.”

Some contemporary Native Hawaiian cultural practitioners continue to view Mauna Kea as a first-born child of Papa and Wākea, and thus, the mountain is revered as “the *hiapo*, the respected older sibling of all Native Hawaiians” (Kanahale and Kanahale 1997 in Langlas 1999:7). Cultural practitioner Kealoha Piscotta explains that this link to Papa and Wākea “is the connection to our ancestral ties of creation” (Orr 2004:61). Pualani Kanaka'ole Kanahale states that “the very fact that it is the 'Mauna a Wākea' tells you that it is the *mauna* that is meeting Wākea” (Maly 1999:A-368).

Traditional genealogical *mele* and *mo'olelo* (stories, traditions) recount associations between Mauna Kea and Poli'ahu, Līlīnoe, Waiau, and Kahoupakane. In a *mo'olelo* recounting the travels of Pūpū-kani-'oe, it was said that Mauna Kea was a mountain “on which dwell the women who wear the *kapa hau* (snow garments)” (Maly and Maly 2005:31). Another *mo'olelo*, which dates to the 1300s, explains that Ka-Miki was sent atop Mauna Kea's summit to the royal compound of Poli'ahu, Līlīnoe, and their ward, Kapiko-o-Waiiau, to fetch water for use in an 'ai-lolo ceremony (Maly and Maly 2005:42-43).

In 1931, Emma Ahu'ena Taylor, a historian of Hawaiian descent with genealogical ties to the lands of Waimea and Mauna Kea, reported on Poli'ahu's residence at Mauna Kea, but also described the creation of Lake Wai'au. She wrote:

Poli'ahu, the snow-goddess of Mauna-kea, was reared and lived like the daughter of an ancient chief of Hawaii. She was restricted to the mountain Mauna-kea by her godfather Kane. She had a nurse Lihau who never left her for a moment. Kane created a silvery

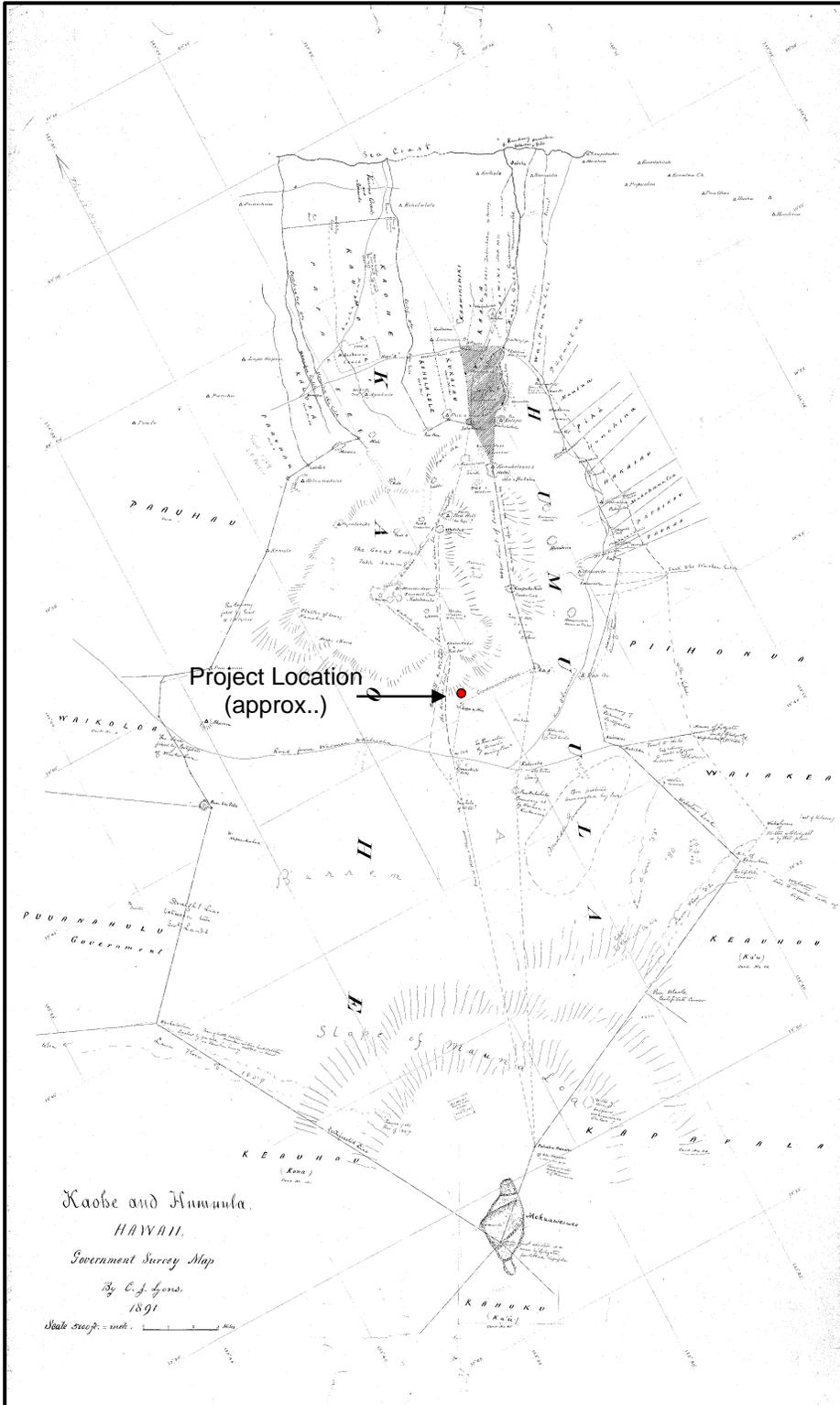


Figure 4. Map Titled *Kaohae and Humuula Hawaii Government Survey Map* by C.J. Lyons 1891 (Hawaii State Archives Registered Map 1641).

swimming pool for his daughter at the top of Mauna-kea. The pool was named Wai-au. The father placed a supernatural guard [Mo`o-i-nanea] at that swimming pool so that Poliahu could play at leisure without danger of being seen by a man... (Maly and Maly 2005:53).

According to Taylor, on Mauna Kea, Poli'ahu's attendants Līlīnoe, Lihau, and Kipu'upu'u drove away her suitor, Kūkahau'ula (the pink-tinted snow god). But Mo'o-i-nanea allowed the snow god to embrace Poli'ahu, and to this day, Taylor reports, "Ku-kahau-ula, the pink snow god, and Poli'ahu of the snow white bosom, may be seen embracing on Mauna-kea" (Maly and Maly 2005:53).

Of the several place names in the vicinity of Halepohaku, Pu'u Kalepeamoā (lit. the comb by a chicken) is the only one to appear on early government survey maps and in the literature on late nineteenth century expeditions to the summit (Figure 4). The Mauna Kea-Humuula trail, first plotted by Alexander in 1892, is shown passing near or through the Halepohaku area.

### 3.2 LAND USE

The summit of Mauna Kea is located in Ka'ohē Ahupua'a, Hāmākua District. Ka'ohē is a large *ahupua'a* found in what Lyons referred to as the "almost worthless wastes of interior Hawaii:"

Then there are the large ahupuaas which are wider in the open country than the others, and on entering the woods expand laterally so as to cut off the smaller ones, and extend toward the mountain till they emerge into the open interior country; not however to converge to a point at the tops of the respective mountains. Only a rare few reach those elevations, sweeping past the upper ends of all the others, and by virtue of some privilege in bird-catching, or some analogous right, taking the whole mountain to themselves...The whole main body of Mauna Kea belongs to one land from Hamakua, viz., Kahoē, to whose owners belonged the sole privilege of capturing the *ua`u*, a mountain-inhabiting but sea-fishing bird.

These same lands generally had the more extended sea privileges. While the smaller ahupuaas had to content themselves with the immediate shore fishery extending out not further than a man could touch bottom with his toes, the larger ones swept around outside of these, taking to themselves the main fisheries much in the same way as that in which the forests were appropriated. Concerning the latter, it should here be remarked that it was by virtue of some valuable product of said forests that the extension of territory took place. For instance, out of a dozen lands, only one possessed the right to *kalai wa`a*, hew out canoes from the koa forest. Another land embraced the *wauke* and *olona* grounds, the former for kapa, the latter for fish-line (Lyons 1875:111).

The boundaries of Ka'ohē, as shown on modern maps, are open to question. A map of the adjoining Humu'ula Ahupua'a made by S.C. Wiltse in 1862 (Hawaii State Archives Register Map No. 668) included the adze quarry and Lake Waiau, which was labeled on the map as "Pond Poliahu." Maly and Maly (2005:280-287) note that

By the time the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them in 1874, disputes over the boundary of Humu'ula and Ka'ohē had arisen...[and]...by the time of settlement in 1891, the boundary of Humu'ula was taken down to around the 9,000 foot elevation, with Ka'ohē taking in the entire summit region.

The testimony of Kahue of Humu'ula, presented in Maly and Maly (2005:287), mentions the boundary running from a gulch called Kahawai Koikapue, where *mele* were sung, to Waiau and then to the summit which was called Pu'uokūkahau'ula. Parenthetically, there is a note that "half of the water in the gulch belonging to Ka'ohē and half to Humu'ula."

In addition to the district and *ahupua'a* system of land tenure, there were other traditional land classifications, including one that employed the term *wao* for a series of natural and cultural zones (Malo 1951:16-18). According to some descriptions, the *wao kanaka* was a low-lying coastal area where the *maka'āinana* were free to move and inhabit. The *wao kele* was the upland forested area that the *maka'āinana* could only access for gathering purposes. The *wao akua*, which was believed to be inhabited

by *akua*, was the subalpine desert region above the tree line. The *maka`āinana* were hesitant to venture into the *wao akua* and could do so only by offering prayer and displaying great respect (NASA 2005:3-18, 3-19).

The Mauna Kea summit region is commonly described today as lying within the *wao akua*, which is different, however, from Malo's description of this zone which placed it at a lower elevation in forested lands (Malo 1951:17). As noted in the footnotes to Malo's *Hawaiian Antiquities* (Malo 1951:18), *wao akua* can also be understood to mean "a remote desolate location where spirits, benevolent or malevolent, lived and people did not live. Usually these places were deep interior regions, inhospitable places such as high mountains, deserts and deep jungles. These areas were not necessarily *kapu* but were places generally avoided out of fear or respect" (PHRI 1999, 24). When Rev. William Ellis toured Hawai'i Island in 1823, he noted the reluctance of native Hawaiians to venture into the summit areas of Mauna Kea:

...numerous fabulous tales relative to its being the abode of the gods, and none ever approach the summit--as, they say, some who have gone there have been turned to stone. We do not know that any have been frozen to death; but neither Mr. Goodrich, nor Dr. Blatchely and his companion, could persuade the natives, whom they engaged as guides up the side of the mountain, to go near its summit (Ellis 1979:292).

Although the *ahupua`a* system (including *kapu* restrictions) of land and resource management no longer exists legally, knowledge of some traditional *kapu* have been passed down and endure. In Maly (1999: A-371), Pualani Kanaka'ole Kanahale stated that she learned from her *kūpuna* that the forested regions are not the realm of humans but rather that the forest's *kupa* (citizens) are the trees. Kanahale notes that "when I go *maha`oi* [intrude] in their realm, I have to ask permission to be up there." Likewise, Irene Lindsey-Fergerstrom indicated that in the context of taking *piko* up to the Mauna Kea summit, that her *tūtū* (grandmother) had knowledge of the *kapu* restriction that only *ali`i* were permitted on the summit (Maly 1999:A-390).

During pre-Contact times, the slopes of Mauna Kea, above the limits of agriculture and permanent settlement, were a vast montane "wilderness" probably known to only a small number of Hawaiians engaged in primarily "special purpose" activities such as bird-catching, canoe making, stone-tool manufacture, or burial of the dead (McEldowney 1982); ethnographic information relating to specific activity localities is generally lacking although archaeological evidence provides some evidence of past land use in the form of adze production (primarily at the Mauna Kea Adze Quarry but elsewhere as well), human burial, and the erection of shrines.

Early post-Contact ascents of Mauna Kea by Europeans and Hawaiians occurred throughout the nineteenth century, including Queen Emma's famous visit to Lake Waiau in 1881 or 1882 (de Silva and de Silva 2007). de Silva and de Silva (2007:5) note that

the historical record of pilgrimages to Maunakea is not limited to Emma's mele and Phillips's mo'olelo. Steve Desha writes, that as a young man, Kamehameha Pai'ea went to Waiau to pray and leave an offering of 'awa. Kamakau tells us that Ka'ahumanu made the same journey in 1828 in an unsuccessful attempt to retrieve the iwi of her ancestress Lilinoe. Kauikeaouli visited Waiau and the summit in 1830, Alexander Liloiliho in 1849 and Peter Young Ka'eo in 1854.

### 3.2.1 PRE-CONTACT PERIOD LAND USE

While the summit region was known and accessible to early Hawaiians, the only activity that is known with certainty to have occurred during the pre-contact period is the manufacture of stone adzes. Radiocarbon dates on wood charcoal and 230 Thorium dates on branch coral indicate that the adze quarry was in use over a period of possibly as much as 700 years between ca. A.D. 1100 and 1800 (McCoy 1986:Figure 28; 1990:Figure 4), although a shorter chronology of perhaps just 500 years now seems more likely. When the quarry was abandoned is unknown and may never be known with any certainty, but there is some evidence that it may have occurred as late as European contact in 1778 or shortly thereafter.

An interesting account of the adze quarry was published by Brigham at the turn of the 20th century:

Let us climb to the workshop of the adze maker. All these were in high places, and one on Mauna Kea, Hawaii, was nearly 12,900 ft. above the sea. As good clinkstone was not found in many places the known quarries hardly exceeded half-a-dozen. On Hawaii was the most important of all, that on Mauna Kea, where the workmen could only work in favorable seasons for the snow frequently covered the quarry, but from the immense quantity of fragments and chips the work must have extended over many generations; so far as known, this was the earliest quarry exploited, and it is puzzling how the place was discovered when we consider the aversion the Hawaiians had to even visiting those high, bleak and desert regions, the supposed abode of spirits not always friendly. It is possible that the tradition which speaks of the survivor of the deluge of Kahinalii grounding on Mauna Kea and following the receding waters to the lower levels, discovering the koi pohaku on the way, may point to the considerable antiquity of adze-making in this place, but I am inclined to believe that all traditions of the Hawaiian deluge date after the coming of the Spanish discoverers. It has always seemed strange that the axe-makers did not bring the raw material down to their homes and work it up in comfort instead of freezing in their kapa garments at this great altitude. It may be that the mystery of the place and its very solitude kept the trade in few hands and so enhanced the value of a tool that so many must have (Brigham 1902:75-76).

Below the summit region, as noted below, other activities related to stone resource procurement (e.g., octopus lure sinkers and bird cooking stones) occurred.

### 3.2.2 POST-CONTACT PERIOD LAND USE

Changes to traditional Hawaiian lifeways began soon after the arrival of Captain James Cook in 1778. One significant change was the rapid adoption of Western tools, clothing and other items, initially by the chiefs and subsequently by commoners. The impact on traditional technologies is known in a general way from historic accounts, such as diaries and newspapers, but for remote centers of traditional crafts, such as the Mauna Kea Adze Quarry, there is little or no information on how long they continued to be utilized before abandonment.

The first recorded ascent of Mauna Kea by a European was made by the Rev. Joseph Goodrich on August 26, 1823 (Goodrich 1833:200). A number of visits followed shortly thereafter, including ones by such prominent figures as the renowned botanist David Douglas (see Maly and Maly 2005 for a comprehensive overview of early visits and expeditions to the top of Mauna Kea). Macrae mentions that Goodrich found a “heap of stones” on a cinder cone which many have interpreted as located on the summit. Macrae’s description suggests a cinder cone at a lower elevation on the edge of the summit plateau:

Rev. Joseph Goodrich, who, on this occasion, was unfortunately laid up with mountain sickness, had on 26th August, 1823, reached the summit of Mauna Kea. This is the first recorded instance of the ascent of this mountain, although Mr. Goodrich mentions that on reaching the top of one of the terminal cones that encircle the main plateau of Mauna Kea, he discovered a heap of stones, probably erected by some former visitor. Who this former visitor was is unknown, but he was probably one of the white men that in the early years of the nineteenth century got a living by shooting wild bullocks that roved on the side of Mauna Kea. It is very unlikely that any native had reached the top of the terminal cones on the summit, owing to being unprovided with warm clothing to resist the great cold and also to the fact that the natives had a superstitious dread of the mountain spirits or gods. About six months after the date of the first ascent of Mauna Kea by Mr. Goodrich, the peak was scaled by Dr. Abraham Blatchley and Mr. Samuel Ruggle, both connected with the American Mission (Macrae 1922:55).

The early 20th century marked the beginning of a new era in the land use history of Mauna Kea. Large numbers of wild sheep were devastating the forests below the summit in the early part of the century. The extent of the devastation was the impetus for a monumental fencing program undertaken by the Civilian Conservation Corps (CCC) in the 1930s. The CCC was also engaged at the same time in improving roads and building facilities for visitors. In 1936 the CCC made improvements to what is believed to have been a section of the old Mauna Kea-Humu`ula Trail, from near the Humu`ula Sheep Station at Kalaieha to the

summit (Bryan 1939:11). According to Bryan (1939:11), the first stone cabin, from which Halepōhaku takes its name (Hale Pōhaku-“House of Stone”), was built by the CCC about this same time. Prior to the construction of a road above Ho`okomo, the cabin at Halepōhaku provided a convenient overnight rest spot for hikers and ski enthusiasts (McCoy 1984:8).

#### 4.0 PREVIOUS ARCHAEOLOGY

Ten archaeological investigations have been conducted at or near Halepōhaku, including an archaeological inventory survey⁵ conducted for the proposed project; no historic properties have been recorded within the proposed telescope location (Figure 5). Four significant historic properties are located within approximately 100 meters of the proposed telescope location, but would not be adversely impacted by the proposed undertaking:

- SIHP 50-10-23-10314; pre-Contact traditional lithic scatter
- SIHP 50-10-23-09074; historic Halepōhaku Rest House 1
- SIHP 50-10-23-09075; historic Halepōhaku Rest House 2; and
- SIHP 50-10-23-09076; historic Halepōhaku Comfort Station

In 1979, a one-day reconnaissance survey of the Halepōhaku area was conducted for the “Hale Pohaku Mid-Level Complex Development Plan.” No archaeological sites were recorded (McCoy 1979).

Three more surveys were conducted between July 1984 and June 1985 as part of the preparation of a supplemental Environmental Impact Statement (EIS) for a permit to build a new construction laborer camp (McCoy 1985a, 1991). Seven noncontiguous historic properties (five lithic scatters and two shrines) were recorded on both sides of the Mauna Kea Observatory Access Road and were collectively designated as the Pu`u Kalepeamoia Site complex (Statewide Inventory of Historic Places [SIHP] 50-10-23-16244). No formal boundary was defined for Site 16244 and it appears that the limits coincide with the collective extent of individual properties (McCoy 1991); each property was also assigned an SIHP number. Two of the properties (SIHP Sites 10310 and 10311 [both lithic scatters]) are located more than 275 meters south of the project area. As noted above, SIHP Site 10314 (lithic scatter) is located approximately 100 m north of the project area.

In 1986, Bonk (Bonk 1986) conducted a reconnaissance survey of a proposed new HELCO transmission line and substation located at Halepōhaku. No historic sites were found during the survey, which extended from an existing 69 KV powerline north of the Saddle Road and west of the Mauna Kea Access Road to the substation location at Halepōhaku.

The subsequent discovery of lithic artifacts in the vicinity of the HELCO substation led to a data recovery project that involved additional survey and surface collections at 11 different lithic scatters and limited test excavations of two of the scatters (Sinoto 1987; McCoy 1991). A total of 2,364 artifacts and 129 faunal remains were collected. In addition to the debris related to adze and octopus sinker manufacture, 20 special purpose bird cooking stones called *pohaku`eho* were recovered. Three radiocarbon dates from charcoal recovered in fire pits indicate that the site, which has been interpreted as a temporary camp occupied for the ascent to and descent from the Mauna Kea Adze Quarry, is of late pre-contact age (ca. AD 1600-1700).

In 1990, a reconnaissance survey at Halepōhaku was conducted in conjunction with the proposed construction of dormitories for the Japan National Large Telescope (later renamed the Subaru Telescope). The survey covered the southern portion of the area surveyed by McCoy (1985a) and relocated two lithic scatters, which were recommended for data recovery investigations (Robins and Hammatt 1990). The data recovery excavations were conducted in 1993; radiocarbon dates from the project confirmed a late pre-Contact occupation of the area (Hammatt and Shideler 2002).

In 2005, archaeological monitoring was conducted during the installation of four septic tanks at Halepōhaku (McCoy 2005). No historic properties or subsurface archaeological deposits were recorded

---

⁵ The archaeological inventory survey was conducted in accordance with Hawaii Revised Statutes (HRS) Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13, Chapter 276.

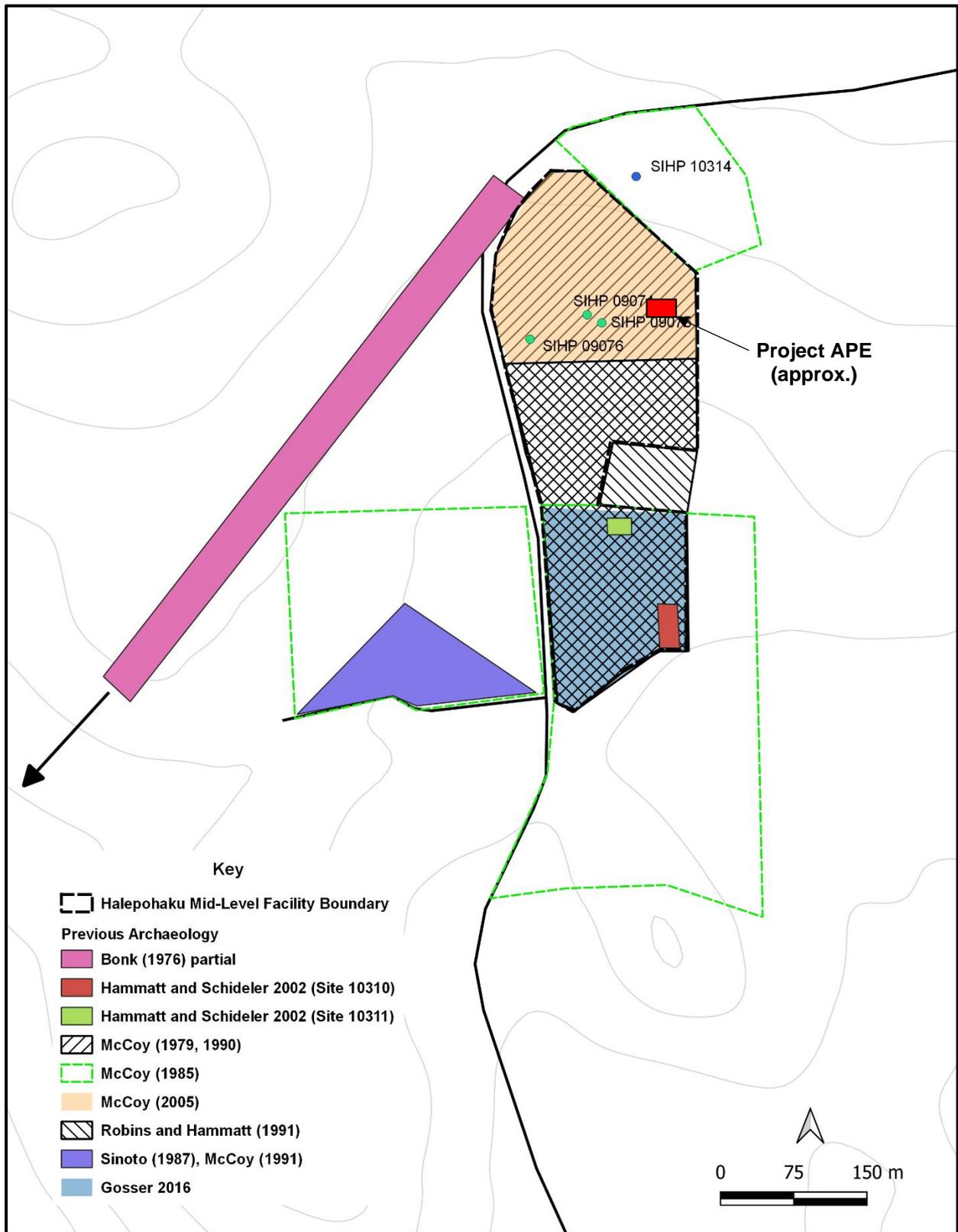


Figure 5. Location of Previous Archaeological Projects.

within the current project area during the monitoring.

In 2016 (Gosser 2016), an archaeological survey was conducted near the Visitor Information Station as part of infrastructure improvements. No new historic properties were recorded, although several isolated artifacts were observed.

#### **SIHP SITE 50-10-23-10314**

SIHP Site 10314 is one of several sites comprising the Pu`u Kalepeamoia Site Complex (McCoy 1991). The site is characterized as a lithic scatter that includes adze and octopus lure sinker manufacturing by-products and other artifacts possibly used in other activities, such as wood-working (McCoy 1991). SIHP Site 10314 covers approximately 2,000 m². Most of the artifacts were found in a single concentration at the base of a clump of living and dead *mamane* trees situated on what is believed to be one of the dunelike bodies of reworked Pu`u Haiwahine tephra (McCoy 1985b).

The site was re-visited in June of 1985 at which time it was noted that the area had been recently disturbed. Because of the potential for more damage, surface artifacts were collected from the most vulnerable areas. A total of 44 artifacts were mapped and collected in an area covering 9 m² (McCoy 1985b). The majority of the artifacts are dunite and gabbro cored bomb fragments related to the manufacture of octopus lure sinkers and manufacturing tools, which were called fabricators. The concentration contained only two basalt waste flakes from adze manufacture (McCoy 1991). Since 2012, SIHP Site 10314 has been visited annually to assess changes. While some natural erosion has exposed additional lithic material, the site has remained undisturbed.

#### **SIHP SITES 50-10-23-09074, 09075, AND 09076 (THE HALEPŪHAKU REST CAMP AND COMFORT STATION)**

The Halepōhaku Rest Camp and Comfort Station comprises three buildings immediately south of the Halepōhaku Mid-Level Support Facility. The buildings were constructed between 1936 and 1950; SIHP Sites 09074 and 09075 (Rest Camp) were constructed by the Civilian Conservation Corps between 1936 and 1939, while SIHP 09076 (comfort station) was constructed in 1950 by the Territory of Hawai`i's Division of Forestry.

The three buildings of the Halepōhaku Rest Camp and Comfort Station have been individually recommended as eligible for the National Register of Historic Places (NRHP) and Hawaii's State Register of Historic Places under Criterion A and Criterion C. These historic properties are associated with events that have made a significant contribution to the broad patterns of history, thus fulfilling Criterion A. These properties also embody the distinctive characteristics of a type, period, or method of construction, thus fulfilling Criterion C.

### **5.0 FIELD SURVEY**

Although the APE has been surveyed by archaeologists during multiple projects (see above), PCSI conducted a pedestrian archaeological inventory survey (AIS) of the APE on 18 October 2019 (Figure 6). The ground surface of the APE has been heavily modified by a dirt access road, the installation of a septic system (see Figure 2), and use of the area for equipment storage. No historic properties or surface archaeological deposits were recorded during the inspection. A *mamane* tree is present to the east of the APE. Because the AIS did not record any historic properties, the AIS report will be reported to SHPD (based on its directives) as an Archaeological Literature Review with Field Inspection (ALRFI; also called an Archaeological Assessment).

### **6.0 CONSULTATION**

In an effort to more fully understand the cultural and historical background and setting within and around the project area and bring as much information to the decision-making process for this project as possible, PCSI sought community input. The consultation process to identify historic and cultural resources attempts to bridge a gap between historic properties and traditional and customary practices.

While the historic preservation component has been well developed in terms of regulatory efforts, the traditional and customary practices aspects, with regards to CIAs, has been slower to develop. One analytical framework for addressing the preservation and protection of customary and traditional native

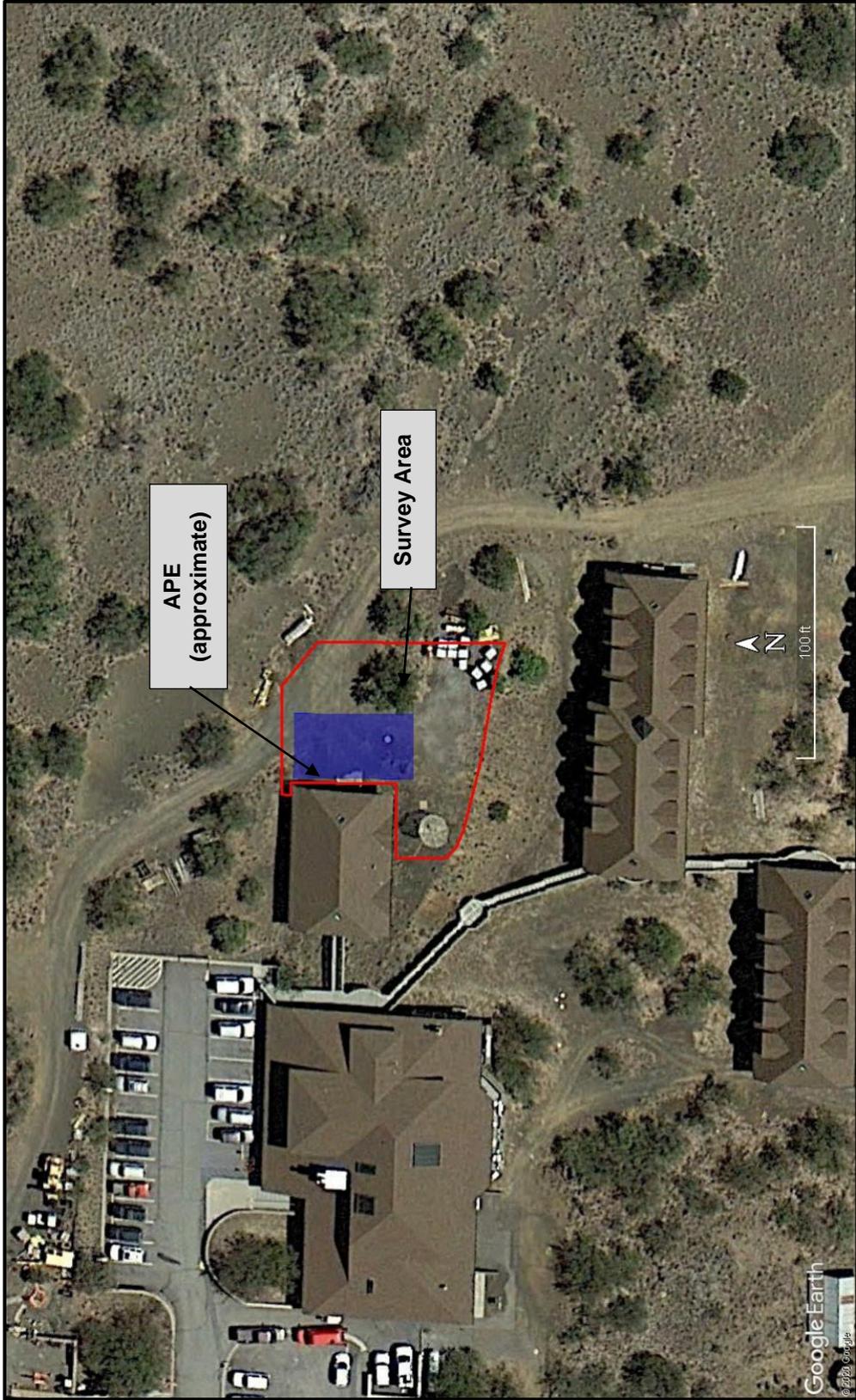


Figure 6. Extent of Field Inspection and Approximate APE.

practices specific to Native Hawaiian communities has been developed as a result of a court case identified as *Ka Pa'akai O Ka 'Āina vs. Land Use Commission (Ka Pa'akai)*. From that court decision, the following three-part process was developed to evaluate potential impacts and is commonly applied to implement and satisfy HRS 343 and the *Guidelines for Assessing Cultural Impacts*:

1. Identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary Native Hawaiian rights are exercised;
2. Identify the extent to which those resources and rights will be affected or impaired; and
3. Specify any measures to be taken to reasonably protect Native Hawaiian rights if they are found to exist.

## 6.1 CONSULTANTS

Initially, consultation invitation letters were sent to 68 entities (community members, community groups, and State agencies) on 30 October 2020 and 29 June 2021 either by email or post asking for input concerning historic sites located in or near the project area, as well as cultural traditions, legends, and traditional cultural places and practices pertaining to the area; the letter included background information as well as a project location map. The 68 entities were identified as interested parties by OMKM, primarily through interactions as part of previous undertakings within University of Hawaii managed lands on Mauna Kea (Table 1). An additional eight potentially interested entities (three of which were alternate chapters or individuals of previously contacted community groups) were identified and sent consultation invitation letters on 1 October 2021.

In addition to the direct mailings, PCSI met with the Kahu Kū Mauna council (KKMC) to discuss the project. KKMC is a volunteer community-based council from the native Hawaiian community that advises the Mauna Kea Management Board, OMKM/CMS, and the UH Hilo Chancellor on Hawaiian cultural matters affecting the UH Management Areas of Mauna Kea.

**Table 1. List of Agencies, Groups, and Individuals Invited to Consult**

<b>State Agencies</b>	<b>Responded</b>
Department of Hawaiian Home Lands	No
DLNR State Historic Preservation Division	Yes
Office of Hawaiian Affairs	Yes
Hawaii State Aha Moku Advisory Committee	No
Department of Business, Economic Development and Tourism	Yes
<b>Community Groups</b>	
KAHEA	No
Nā 'Ahahui: Moku o Keawe -- Kohala Hawaiian Civic Club	No
Royal Order of Kamehameha I*	Yes
Royal Order of the Crown of Hawai'i	No
Perpetuating Unique Educational Opportunities (P.U.E.O)	No
Queen Lili'uokalani Trust	No
Nā Wahine O Kamehameha	No
Kailapa Community Association	No
Pi'ihonua Hawaiian Homestead Community Association	No
La'i 'Ōpua Association	No
Waimea Hawaiian Homesteaders' Association	No
Keaukaha Community Association*	No
Hawaii Island Native Hawaiian Chamber of Commerce*	Yes
Kua O Ka La*	No
Sovereign Councils of the Hawaiian Homelands Assembly*	No
'Ahahui Ka'ahumanu*	No

**Table 1. List of Agencies, Groups, and Individuals Invited to Consult**

<b>Education Groups</b>	
American Astronomical Society, Executive Office	No
American Astronomical Society, Historical Astronomy Division	No
Hanakahi Council--UHH Native Hawaiian Faculty Advisory Group	Yes
Institute for Astronomy*	No
Edith Kanaka'ole Foundation*	No
<b>Individuals</b>	
Bimo Akiona	No
Brannon Kamahana Kealoha	No
C.M. Kaho'okahi Kanuha	No
Cheyenne Perry	No
Cindy Freitas	No
Clarence Kukauakahi Ching	No
Dr. Kamana'opono Crabbe	No
Dwight Vincente	No
Flores-Case 'Ohana	No
Hank Fergerstrom	No
Hannah Springer	No
J. Leina'ala Sleightholm	No
Jim Kauahikaua	No
Joseph Kualii Lindsey Camara	No
Kalani Flores	No
Kala Asing	No
Kaliko Kanaele	Yes
Kama Hopkins	No
Keahi Warfield	No
Kealoha Pisciotta	No
Kehaulani Costa	No
Kimo Lee	No
Lanny Sinkin	No
Lehua Vincent	Yes
Leilani Lindsey-Kaapuni	No
Mamo Bezilla	No
Mehana Kihoi	No
Michael Akau	No
Mike Kaleikini	No
Mike McCartney	No
Moses Kealamakia Jr.	No
Nelson Ho	No
Patrick Kahawaiolaa	No
Paul K. Neves	No
Pua Case	No
Richard Ha	No
Thomas Chun	No
Tiffnie Kakalia	No
Walter Kaneakua	No
William Freitas	No

**Table 1. List of Agencies, Groups, and Individuals Invited to Consult**

Wilma Holi	No
Shane Palacat-Nelsen	No
Leningrad Elarianoff	Yes
U'ilani Naipo	No
Kālepa Baybayan	No
Kimo Lee	No
Wally Lau	No
Nakoolani Warrington	No
Wally Ishibashi	No

*Groups or individuals invited to consult on 1 October 2021

Finally, an invitation to participate in the consultation process was published in the Public Notices section of the December 2021 (Figure 7) edition of the *Ka Wai Ola* newsletter (Office of Hawaiian Affairs).

## 6.2 RESPONSES

There were no responses following the Public Notice publication in the *Ka Wai Ola* newsletter.

Nine responses were returned from the email/postal solicitation. None of the responses provided specific information concerning historic properties, cultural resources, or traditional practices within the project area. Nonetheless, several responses provided feedback and recommendations to strengthen the CIA; several consultants also noted an opposition to further development on Mauna Kea. Below are summaries of the responses.

- The Office of Hawaiian Affairs (OHA) requested regulatory clarification concerning why an archaeological inventory survey (AIS) and an archaeological literature review (ALR) was being conducted for the project.
  - As noted above, an AIS (with no subsurface testing) was conducted for the APE. However, because the AIS resulted in negative findings (no historic properties), the document will be prepared as an ALR with field inspection following the guidance of SHPD.
- The Office of Hawaiian Affairs also recommended providing invited consultants a more integrated discussion that provides information concerning how the invited information could be used and how the invited information might be integrated with other proposed projects, specifically the Hōkū Ke‘a Decommissioning Project, which will remove an observatory previously used as the UH Hilo Educational telescope from the summit region. The Halepohaku project will provide a new location for the UH Hilo Educational telescope.
  - Subsequent invitations to potential consultants clarified the regulatory aspects as well as the nature of the consultation request. Most of the invited parties were also invited to consult on the Hōkū Ke‘a Decommissioning Project, which also provided regulatory and cross-project clarification.
- The State Historic Preservation Division (SHPD) had no substantive comments but did provide several historic preservation-related reports pertinent to the Mauna Kea summit region.
  - The additional reports were integrated into the CIA
- The University of Hawaii-Hilo Hanakahi Council (UHH Native Hawaiian Faculty Advisory Group) requested a presentation.
  - An email providing links to the overall project, including background information and project details was provided

Kamohiwikiwiki [ARTICLES](#) [ISSUES](#) [VIDEOS](#) [COMMUNITY](#) [CALENDAR](#) [ABOUT](#) [SEARCH](#)

692-8020, Email: [Regina.Hilo@hawaii.gov](mailto:Regina.Hilo@hawaii.gov)]. All interested parties shall respond within thirty (30) days of this notice and file descendency claim forms and/or provide information to the SHPD adequately demonstrating lineal descent from this specific burial or cultural descent from ancestors who once resided, or are buried in, the same ahupua'a or district.

## Cultural Impact Assessment Notice: UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea, Ka'ōhe Ahupua'a, Hāmākua District, Island of Hawai'i

Pacific Consulting Services, Inc. (PCSI), on behalf of the University of Hawai'i at Hilo (UH Hilo), is preparing a Cultural Impact Assessment (CIA) for the proposed UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea, Ka'ōhe Ahupua'a, Hāmākua District, Island of Hawai'i (TMK [3] 4-4-015:012). The new educational telescope facility at Halepōhaku will replace the Hōkū Ke'a Observatory located at the summit, which is planned for decommissioning. This new telescope will be used by students for training in modern astronomical observing techniques, developing skills in scientific research, and communicating science to the general public. The CIA team is seeking consultation with practitioners, Native Hawaiian Organizations, stakeholders, and other interested individuals. Specifically, consultation is sought on a) historic or existing cultural resources that may be impacted by the proposed project, b) historic or existing traditional practices and/or beliefs that may be impacted by the proposed project, and c) identification of individuals or organizations that should be sought out for consultation on the CIA. Individuals or organizations interested in participating can contact the CIA team by email at [halepohaku@pcsihawaii.com](mailto:halepohaku@pcsihawaii.com), by mail at UHH New Educational Telescope, c/o Pacific Consulting Services, Inc., 720 Iwilei Road, Suite 424, Honolulu, HI 96817, or by phone at 808.546.5557, ext. 212.

### Cultural Impact Assessment Notice: Hōkū Ke'a Observatory Decommissioning Project, Mauna Kea, Ka'ōhe Ahupua'a, Hāmākua District, Island of Hawai'i

**Related Articles**



News Briefs

**News Briefs | December 2021**  
 Ka Wai Ola Staff · December 1, 2021 0  
 News Briefs - December 2021 Issue of Ka Wai Ola



**Public Notice | December 2021**  
 Public Notices · December 1, 2021



**Public Notice | November 2021**  
 Public Notices · November 1, 2021



**News Briefs | November 2021**  
 News Briefs · November 1, 2021



**Ho'olewa for Haunani-Kay Trask**  
 News · November 1, 2021

**Send Us Your Feedback**

Figure 7. Screen Capture of the December 2021 Public Notice Published in the *Ka Wai Ola* Newsletter.

- One community member (Mr. Leningrad Elarianoff) provided information concerning Hawaiian origins passed down to him from his mother who "...was a story teller who spent many hours with the old folks in Kau trading stories that were passed down for generations."
- One community member (Mr. Kaliko Akulele) did not provide specific information concerning historic properties or traditional or customary places or practices within or near the project area but did voice an opposition to any further development on Mauna Kea (especially the top)
- The Royal Order of Kamehameha did not provide specific information concerning historic properties or traditional or customary places or practices within or near the project area but did voice an opposition to development of any kind on Mauna Kea
- The President of the Hawaii Island Native Hawaiian Chamber of Commerce responded saying she would share the provided information with her board and reply. No additional information was received.
- The Department of Business, Economic Development and Tourism responded saying they had no information to provide concerning the subject matter
- One community member (Mr. Lehua Vincent) responded choosing not participate but commented that he did not support another telescope on Mauna Kea

## **7.0 POTENTIAL PROJECT CULTURAL IMPACTS AND RECOMMENDATIONS**

### **7.1 DETERMINING EFFECTS TO SIGNIFICANT HISTORIC PROPERTIES (HAR §13-275-7)**

Based on the results of research and consultation, the effect determination for this project is "No historic properties affected." Recommendations are provided below.

### **7.2 CONSULTATION**

With respect to the Ka Pa'akai analysis (as described in Section 6.0), the consultation process did not identify any previously unknown historic properties, traditional properties, or traditional/customary cultural practices within the proposed project area. As such, based on the consultation process, there is no indication that any Native Hawaiian resources or rights will be affected or impaired as a result of the proposed decommissioning project. While the first two components of a Ka Pa'akai analysis can, and typically do focus directly on a specific project design or area, the third component of mitigation is an opportunity to speak to and support broader themes of cultural responsibility that can be fruitfully addressed as recommendations.

### **7.3 RECOMMENDATIONS**

Based on the results of background research and consultation, it is recommended that the effect determination for this project is "No historic properties affected." However, because the proposed project will include ground disturbance in an area near where non-contiguous archaeological deposits have been recorded, it is recommended that a commitment be made to monitor (with an SHPD-approved monitoring plan) ground-disturbing activities during construction for identification purposes.

The lack of identified traditional or customary practices within the proposed project area should not diminish the need for culturally appropriate protocols being established for the project within a demonstrably culturally sensitive landscape. Although not mandated by State historic preservation rules, it is recommended that a cultural monitor be engaged throughout the project planning and implementation. Likewise, it is also recommended that a cultural monitoring plan (developed in consultation with KKMC) be established to provide guidance and constancy throughout the project.

## 8.0 REFERENCES

- Bonk, William J.  
1986 An Archaeological Survey at the Middle Level, Southern Flank of Mauna Kea, Hawaii. *Papers in Ethnic & Cultural Studies* 86-2.
- Brigham, W. T.  
1902 *Stone Implements and Stone Work of the Ancient Hawaiians*. Memoirs of the B.P. Bishop Museum, Vol. 14, No. 4. Bishop Museum Press, Honolulu.
- Collins, Sara L., and Patrick McCoy  
2014 *Final Report: Burial Treatment Plan for Burial Sites in the Mauna Kea Science Reserve and the Mauna Kea Access Road Corridor, Ka'ohē Ahupua'a, Hamakua District, Hawaii Island TMK (3)4-4-015:009 and (3)4-4-015:por. 001*. Prepared for the Office of Mauna Kea Management by Pacific Consulting Services, Inc., Honolulu.
- CMP (Comprehensive Management Plan)  
2009 *Mauna Kea Comprehensive Management Plan UH Management Areas*. Manuscript on file at SHPD, Kapolei.
- DePaolo, D.J., and E.M. Stolper  
1996 Models of Hawaiian Volcano Growth and Plume Structure: Implications of results from the Hawaii Scientific Drilling Project. *Journal of Geophysical Research* 101(B5):11643-11654.
- de Silva, Kihei, and Mapuana de Silva  
2007 *E Ho'ka Nani I Mana*. Ka'iwakiloumoku-Hawaiian Cultural Center, University of Hawaii at Manoa, Honolulu. 8/2/2007. <http://hccp.ksbe.edu/kaleinamanu/8-ehoikanani.php>.
- Ellis, William  
1979 *Journal of William Ellis: Narrative of a Tour of Hawaii, or Owhyhee; with Remarks on the History, Traditions Manners, Customs, and Language of the Inhabitants of the Sandwich Islands*. Charles E. Tuttle Company, Inc. Rutland, Vermont.
- Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger.  
2014. Evapotranspiration of Hawai'i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai'i.
- Goodrich, Joseph  
1826 Notice of the Volcanic Character of the Islands of Hawaii. *American Journal of Science* Ser. 1, 11:2-7.  
1833 In "Letters to the Editor." *American Journal of Science* 25:199-20.
- Gosser, Dennis, Stephan D. Clark, and Richard C. Nees  
2014 *Long-Term Historic Property Monitoring Plan for the Three University of Hawaii Management Areas on Mauna Kea, Ka'ohē Ahupua'a, Hāmākua District, Hawai'i Island, State of Hawai'i*. Manuscript on file at SHPD, Kapolei.
- Hammatt, Hallett H., and David W. Shideler  
2002 Data Recovery Report for Two Archaeological Lithic Scatters, Sites 50-10-23-10,310 and 50-10-23-10,311 at The Pu`u Kalepeamoā Complex, Hale Pohaku, Ka`ohē Ahupua`a, Mauna Kea, Hawaii Island (TMK 4-4-15:12). Prepared for The Institute for Astronomy, University of Hawaii.
- Hibbard, Don  
1999 Letter of May 3, 1999 to Dr. Robert McLaren (IfA) Regarding Historic Preservation Review of the Proposed W.M. Keck Outrigger Telescopes Project.
- Kamakau, Samuel M.  
1961 *The Ruling Chiefs of Hawaii*. Kamehameha Schools/Bishop Estate. Honolulu.  
1976 *The Works of the People of Old (Na Hana a ka Po'e Kahiko)*. Bernice P. Bishop Museum Special Publication 61.

- Kanahele, P.K., and Edward L.H. Kanahele  
 1997 *A Hawaiian Cultural Assessment of the Proposed Saddle Road Alignments. Project A-AD-6(1), Hilo, Hawaii.*
- Langlas, Charles  
 1999 *Supplement to Archaeological, Historical and Traditional Cultural Property Assessment for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR200) Project.*
- Langlas, Charles, Thomas R. Wolforth, James Head, and Peter Jensen  
 1997 *Archaeological Inventory Survey and Historical and Traditional Cultural Property Assessment for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR200) Project, Districts of South Kohala, Hamakua, North Hilo and South Hilo, Island of Hawai'i.* Paul H. Rosendahl Ph.D., Inc., Hilo. Prepared for RUST Environmental and Infrastructure Inc., Phoenix, Arizona.
- Lyons, C.  
 1875 Land Matters in Hawaii. *The Islander* 1:1-33.
- Macrae, James  
 1922 *With Lord Byron at the Sandwich Islands*, edited by W.F. Wilson. Honolulu.
- Macdonald, Gordon A., and Agatin T. Abbott  
 1970 *Volcanoes in the Sea: The Geology of Hawaii.* University of Hawaii Press, Honolulu.
- Malo, David  
 1951 *Hawaiian Antiquities.* Bernice P. Bishop Museum Special Publication 2. Second Edition. Bishop Museum Press, Honolulu.
- Maly, Kepa  
 1998 "Mauna Kea—Kuahiwi Ku Ha'o Malie." A Report on Archival and Historical Documentary Research, Ahupua'a of Humu'ula and Ka'ohe, Districts of Hilo and Hamakua, Island of Hawai'i. Kumu Pono Associates. Hilo.  
 1999 "Mauna Kea Science Reserve and Hale Pohaku Complex Development Plan Update: Oral History and Consultation Study, and Archival Literature Research. Ahupua'a of Ka'ohe (Hamakua District) and Humu'ula (Hilo District), Island of Hawai'i. In *Mauna Kea Science Reserve Master Plan* (Appendix I), Group 70 International, Inc. Honolulu.
- Maly, Kepa, and Onaona Maly  
 2005 *Mauna Kea—Ka Piko Kaulana o Ka 'Aina* (Mauna Kea—The Famous Summit of the Land: A Collection of Native Traditions, Historical Accounts, and Oral History Interviews for: Mauna Kea, the Lands of Ka'ohe, Humu'ula and the 'Aina Mauna on the Island of Hawai'i. Prepared for the Office of Mauna Kea Management. Kumu Pono Associates LLC. Hilo.
- McCoy, Patrick C., and Richard C. Nees  
 2010 *Archaeological Inventory Survey of the Mauna Kea Science Reserve Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i TMK: (3) 4-4-015: 09 (por.).* Manuscript on file at SHPD, Kapolei.
- McCoy, Patrick  
 1977 The Mauna Kea Adz Quarry Project: A Summary of the 1975 Field Investigations. *Journal of the Polynesian Society* 86(2):233-244.  
 1979 Letter Report Dated August 22, 1979 to Mr. Francis Oda on archaeological reconnaissance survey of two alternative locations for the Proposed Mauna Kea Mid-Elevation Facilities. Department of Anthropology, Bishop Museum.  
 1984 Mauna Kea Summit Region Survey: A Summary of the 1984 Fieldwork. Ms. on file at the Department of Anthropology, Bishop Museum.  
 1985a Biogeoclimatic Factors of Production in a Hawaiian Alpine Desert AdzeQuarry. Paper Presented at the 50th Annual Meeting of the Society for American Archaeology, Denver, Colorado.  
 1985b Preliminary Archaeological Survey of the Pu`u Kalepeamoia Site, Mauna Kea, Hawaii. Appendix C of the Amendment to the Mauna Kea Science Reserve Complex Development Plan. Draft

- Supplemental Environmental Impact Statement for Construction Camp Housing at Hale Pohaku, Hamakua, Hawaii. University of Hawaii.
- 1986 Archaeological Investigations in the Hopukani and Lilo Springs Area of the Mauna Kea Adze Quarry, Hawai'i: A Data Summary Report. Ms. on file at the Department of Anthropology, Bishop Museum.
- 1990 Subsistence in a "Non-Subsistence" Environment: Factors of Production in a Hawaiian Alpine Desert Adze Quarry. In *Pacific Production Systems: Approaches to Economic Prehistory*, edited by D.E. Yen and J.M.J. Mummery, pp. 85-119. Occasional Papers in Prehistory, No. 18, Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra.
- 1991 Survey and Test Excavations of the Pu`u Kalepeamo Site, Mauna Kea, Hawai'i. Prepared for Facilities Planning and Management Office, University of Hawaii. Ms. on file in the Department of Anthropology, Bernice P. Bishop Museum. Honolulu.
- 2005 Archaeological Monitoring of Four Septic Tank Excavations at the Mid-Level Facilities Located at Hale Pohaku, Mauna Kea, Ka'ohe, Hamakua. Island of Hawai'i (TMK: [3]:4-4-015:012. Prepared for the University of Hawaii Institute for Astronomy.
- McCoy, Patrick C., Sara Collins, and Stephan D. Clark  
 2009 *A Cultural Resource Management Plan for the University of Hawaii Management Areas On Mauna Kea, Ka'ohe, Hamakua, Island of Hawai'i*. Prepared for the Office of Mauna Kea Management.
- McEldowney, Holly  
 1982 Ethnographic Background of the Mauna Kea Summit Region. Report 1. In *Cultural Resources Reconnaissance of the Mauna Kea Summit Region*. Bishop Museum Department of Anthropology ms.
- Moore, James G., and D.A. Clague  
 1992 Volcano growth and the evolution of the island of Hawaii. *Geological Society of America Bulletin* 104(10):1471-1484.
- NASA (National Aeronautics and Space Administration)  
 2005 *Final Environmental Impact Statement for the Outrigger Telescopes Project*. Vols. 1 and 2. Washington, D.C.
- Orr, Maria  
 2004 *Cumulative Cultural Impact Study/Assessment, Desktop Study & Ethnographic Survey, NASA W.M. Keck Observatory Outrigger Telescopes, Mauna Kea, Kaohe & Humu'ula Ahupua'a, Moku of Hamakua & Hilo, Hawai'i*. Prepared for International Archaeological Institute, Inc. (IARII), National Aeronautics and Space Administration (NASA), Tetra Tech, Inc., and Science Applications International Corporation (SAIC).
- PHRI (Paul H. Rosendahl, Ph.D., Inc.)  
 1999 *Cultural Impact Assessment Study: Native Hawaiian Cultural Practices, Features, and Beliefs Associated with the University of Hawai'i Mauna Kea Science Reserve Master Plan Project Area*. Prepared for University of Hawaii Institute for Astronomy. In Mauna Kea Science Reserve Master Plan (Appendix N).
- Porter, Stephen C.  
 1979 Geological Map of Mauna Kea Volcano, Hawaii. The Geological Society of America, Inc.
- Robins, Jennifer, and Hallett H. Hammatt  
 1990 Archaeological Reconnaissance for Summit and Mid-Level Facilities for the Proposed Japan National Large Telescope. Prepared for MCM Planning, Honolulu.
- Sharp, W.D., and P.R. Renne  
 2003 The ⁴⁰Ar/³⁹Ar dating of a Core Recovered by the Hawaii Scientific Drilling Project (Phase 2), Hilo, Hawaii. *Geochemistry, Geophysics, Geosystems* 6 (No. Q04G17): doi:10.1029/2004GC000846).

- Sherrod, D.R., J.M. Sinton, S.E. Watkins, and K.E. Brunt  
2007 *Geologic Map of the State of Hawaii*. U.S. Geological Survey Open-File Report 2007-1089.
- Stearns, H.T., and G.A. Macdonald  
1946 *Geology and Ground-Water Resources of the Island of Hawaii. Hawaii Division of Hydrography Bulletin 9*. Honolulu.
- U.S. Geological Survey  
2002 *Mauna Kea: Hawaii's Tallest Volcano*. From <http://hvo.wr.usgs.gov/volcanoes/maunakea>.
- Wentworth, Chester K., and William E. Powers  
1941 *Multiple Glaciation of Mauna Kea, Hawaii. Bulletin of the Geological Society of America*. 52:1193-1216.
- Wolfe, Edward W., William S. Wise, and G. Brent Dalrymple  
1997 *The Geology and Petrology of Mauna Kea Volcano, Hawaii—A Study of Postshield Volcanism*. U.S. Geological Survey Professional Paper 1557, Washington, D.C.
- Wolfe, Edward W., and Jean Morris, Compilers  
1996 *Geologic Map of the Island of Hawaii*. U.S. Geological Survey, Miscellaneous Investigation Series. Washington, D.C.

*This page intentionally left blank.*

# Appendix C

---

Archaeological Literature Review with Field Inspection in  
Support of the UH Hilo Educational Telescope at the  
Halepōhaku Mid-Level Support Facility on Maunakea, Hawai'i  
Island, Hawai'i

*This page intentionally left blank.*

PRELIMINARY DRAFT REPORT

Archaeological Literature Review with Field Inspection in Support of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea, Hawai'i Island, Hawai'i

TMK: (3) 4-4-015:012

Prepared For:  
SSFM International  
99 Aupuni Street, Suite 202  
Hilo, Hawaii 96720

Prepared By:  
Pacific Consulting Services, Inc.  
720 Iwilei Road, Suite 424  
Honolulu, HI 96817

December 2020

DRAFT

This Page Left Blank Intentionally

## MANAGEMENT SUMMARY

Document Title:	Archaeological Literature Review with Field Inspection in Support of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea, Hawai'i Island
Date/Revised Date:	Preliminary Draft: December 2020
Archaeological Permit #:	SHPD Permit No. 20-29
Project Location:	Mauna Kea Mid-Level Support Facility, Ka'ōhe Ahupua'a, Hāmākua District, Island of Hawai'i
Project TMK:	TMK (3) 4-4-015:012
Land Owner:	State of Hawai'i
Project Proponents:	University of Hawaii-Hilo
Project Tasks:	Archaeological Literature Review with Field Inspection
Project Acreage:	1,200 square feet (0.03 acres)
Principal Investigator:	Dennis Gosser, M.A.
Regulatory Oversight:	Hawaii Revised Statutes (HRS) Chapter 6E-7 and 6E-8, and Hawaii Administrative Rules (HAR) Chapter 275
Project Background:	The project scope of work includes the construction of the observatory building to house the new UH Hilo Educational telescope
SIHP #:	None
Findings:	Archaeological investigations have documented four historic properties within a 100 meters of the project area; 50-10-23-10314 (pre-Contact lithic scatter), 50-10-23-09074 (historic structure), 50-10-23-09075 (historic structure), and 50-10-23-09076 (historic structure).
Human Skeletal Remains:	None identified within the project area.
Recommendations:	<p><b>Recommended effect determination:</b> No historic properties affected</p> <p><b>Recommended commitments:</b> Because the proposed project will include ground disturbance in an area near where non-contiguous archaeological deposits have been recorded, it is recommended that a commitment be made to monitor (with an SHPD-approved monitoring plan) ground-disturbing activities during construction.</p>

DRAFT

This Page Left Blank Intentionally

## TABLE OF CONTENTS

MANAGEMENT SUMMARY .....	i
TABLE OF CONTENTS .....	iii
LIST OF FIGURES .....	iii
LIST OF TABLES .....	<b>Error! Bookmark not defined.</b>
1.0 INTRODUCTION.....	1
1.1 PROJECT PURPOSE, REGULATORY GUIDANCE, AND AREA OF POTENTIAL EFFECT (APE) .....	1
1.2 METHODS .....	1
2.0 ENVIRONMENTAL BACKGROUND .....	1
2.1 SETTING .....	1
2.2 CLIMATE, HYDROLOGY, AND FLORA .....	5
3.0 HISTORICAL BACKGROUND .....	5
3.1 PLACE NAMES, MYTHS, LEGENDS, AND TRADITIONAL HISTORIES .....	5
3.2 LAND USE .....	6
3.2.1 PRE-CONTACT PERIOD LAND USE .....	9
3.2.2 POST-CONTACT PERIOD LAND USE .....	9
4.0 PREVIOUS ARCHAEOLOGY .....	10
SIHP SITE 50-10-23-10314 .....	12
SIHP SITES 50-10-23-09074, 09075, AND 09076 (THE HALEPŌHAKU REST CAMP AND COMFORT STATION) .....	12
3.0 FIELD SURVEY .....	13
4.0 ANTICIPATED FINDS.....	13
5.0 PROJECT IMPACT ASSESSMENT .....	13
5.1 CONSULTATION .....	13
5.2 DETERMINING EFFECTS TO SIGNIFICANT HISTORIC PROPERTIES (HAR §13-275-7) .....	13
6.0 REFERENCES.....	15

## LIST OF FIGURES

Figure 1 Island of Hawai'i Showing the District, Ahupua'a, Mauna Kea Science Reserve, Natural Area Reserve, and Project Location.....	2
Figure 2 Halepōhaku Mid-Level Facility Showing Proposed Location APE for the New Teaching Telescope (Red Box) .....	3
Figure 3. The Summit Plateau Looking Northeast with Pōhakoloa Gulch in the Foreground, Pu'u Kūkahau'ula (summit) at the top center, and Pu'u Makanaka in the Distance. ....	4
Figure 4. Map Titled <i>Kaohe and Humuula Hawaii Government Survey Map by C.J. Lyons 1891</i> (Hawaii State Archives Registered Map 1641). ....	7
Figure 5. Location of Previous Archaeological Projects.....	11
Figure 6. Extent of Field Inspection and Approximate APE. ....	14

DRAFT

This Page Left Blank Intentionally

## 1.0 INTRODUCTION

Under contract to SSFM, International (SSFM), Pacific Consulting Services, Inc. (PCSI) has prepared this Archaeological Literature Review with Field Inspection (ALRFI) in support of the proposed location of the UH Hilo Educational Telescope at the Halepōhaku Mid-Level Support Facility on Mauna Kea¹, Ka'ōhe Ahupua'a, Hāmākua District, Island of Hawai'i (Figures 1 and 2). The project proponent is the University of Hawai'i-Hilo (UHH). The 19.3-acre Halepōhaku Mid-Level Support Facility is leased from the State of Hawaii and managed by the University of Hawai'i (CDUP No. HA-1819, Tax Map Key [3] 4-4-15:12) and includes modern buildings housing offices and dormitories, the Onizuka Center for International Astronomy (OCIA), the Visitor Information Station (VIS), and several historic buildings.

The new educational telescope facility at Halepōhaku will replace the Hōkū Ke'a Observatory (planned for decommissioning) located at the summit. This new telescope will be used by students for training in modern astronomical observing techniques, developing skills in scientific research, and communicating science to the general public.

### 1.1 PROJECT PURPOSE, REGULATORY GUIDANCE, AND AREA OF POTENTIAL EFFECT (APE)

The objective of developing this ALRFI is to gather together information concerning historic properties and cultural resources that may be impacted by the proposed UHH Educational Telescope project. The current study draws upon and is in compliance with Hawaii Revised Statutes Chapter 6E-8 as well as Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13 (State Historic Preservation Division [SHPD] Rules), Chapter 275: (Rules Governing Procedures for Historic Preservation Review for Governmental Projects). The ALRFI will be submitted to SHPD in order to obtain a "determination letter" for the project (HAR §13-275-3). The determination letter will provide a response to the recommended actions (with regards to historic preservation) set forth in this document.

The proposed project activities include:

- Construction of an observatory building to house the telescope and associated equipment; and
- Conduit trench excavations for utilities servicing the telescope.

The Area of Potential Effect (APE) is approximately 1,200 square feet (0.03 acres) bounded on the west by Halepōhaku Dorm "A," on the north and east by a graded access road, and arbitrarily on the south (see Figure 2).

### 1.2 METHODS

PCSI staff conducted a historical and archaeological literature review for the Halepōhaku project in order to assess any potential effect on historic properties or other cultural resources. The background research was completed using various documentary and archival resources, including the State Historic Preservation Division's (SHPD) database of archaeological reports, the SHPD report library, a review of historic maps, and a review of Mauna Kea reports on file at PCSI. As part of a HRS 343 environmental impact assessment for the project, community consultation was initiated with community members and groups. The results of the consultation are summarized below.

## 2.0 ENVIRONMENTAL BACKGROUND

### 2.1 SETTING

Mauna Kea is the highest (4,205 m² [13,796 ft] above sea level [asl]) and second largest of the five shield volcanoes forming the island of Hawai'i and is between 600,000 and 1.5 million years old (DePaolo and Stolper 1996; Moore and Clague 1992; Sharp and Rene 2005; Wolfe et al. 1997) (Figure 3). The oldest stage of volcanism consists of a basaltic shield called the Hāmākua Volcanic Series (Stearns and

---

¹ Where applicable, geographic names follow the Hawaii Geographic Names Board Place Names (October 2018).

² Metric abbreviation use and style follow the Society for American Archaeology American Antiquity Style Guide (2018).

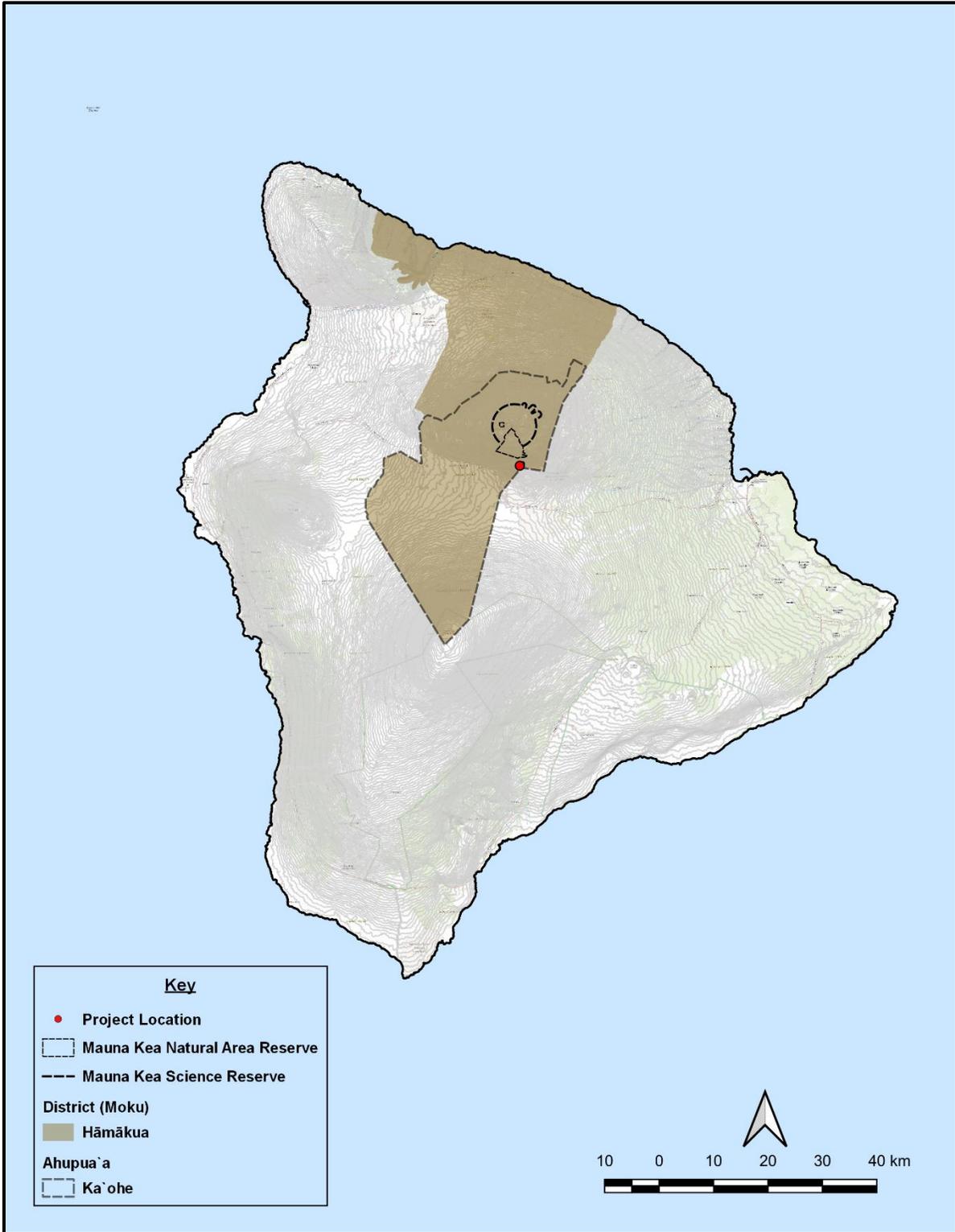


Figure 1 Island of Hawai'i Showing the District, Ahupua'a, Mauna Kea Science Reserve, Natural Area Reserve, and Project Location.

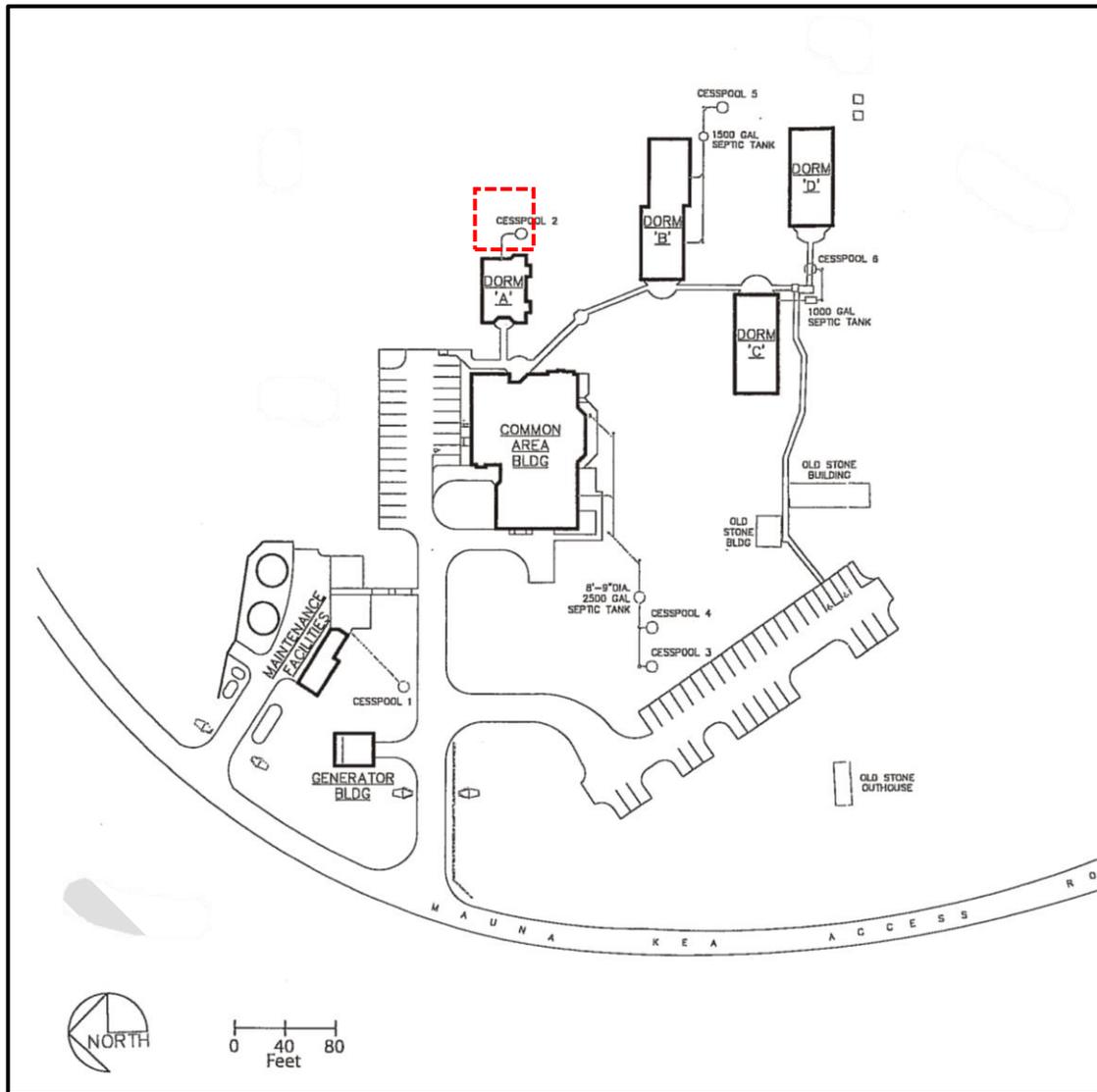


Figure 2 Halepōhaku Mid-Level Facility Showing Proposed Location APE for the New Teaching Telescope (Red Box)

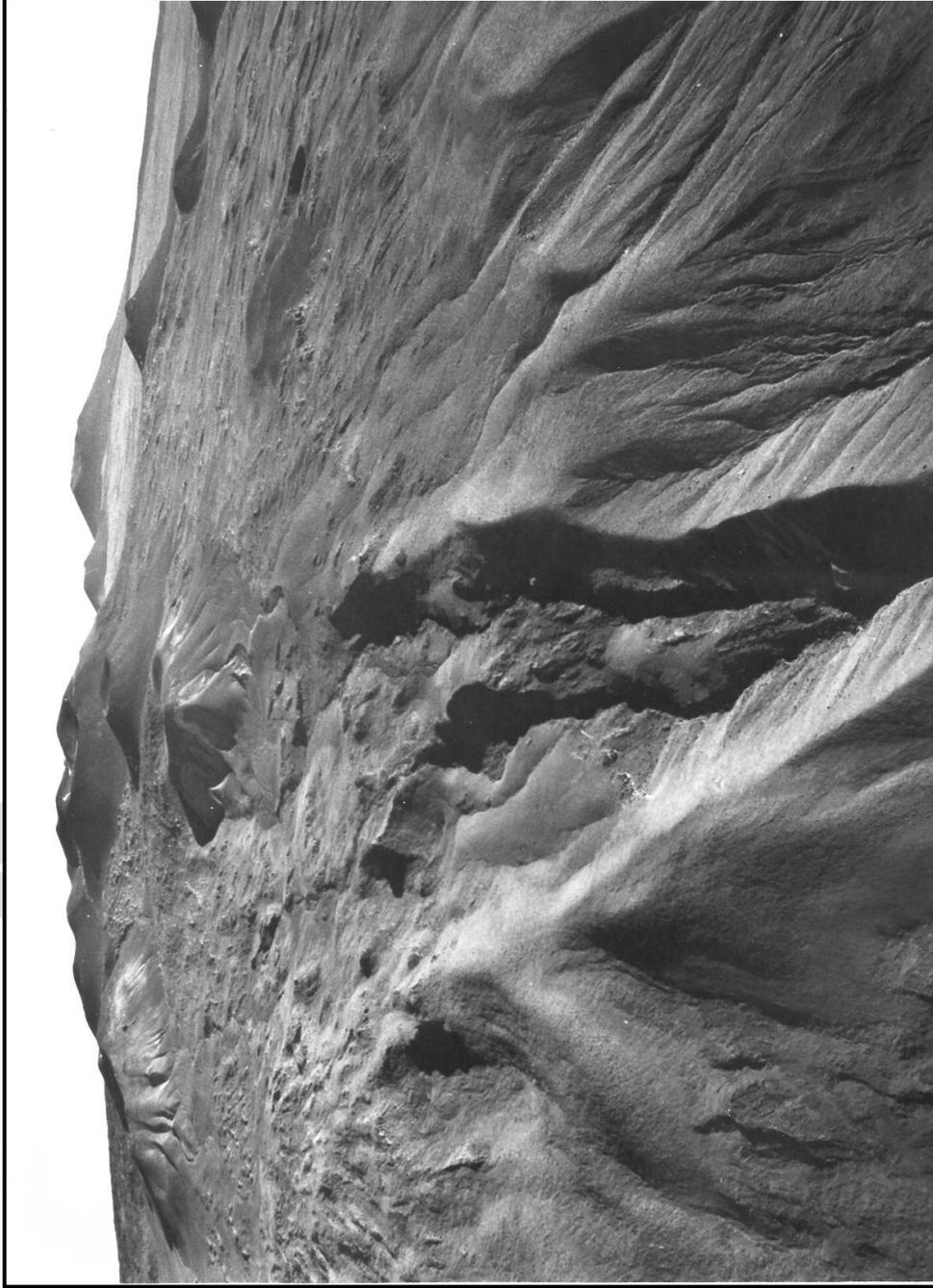


Figure 3. The Summit Plateau Looking Northeast with Pōhakoloa Gulch in the Foreground, Pu'u Kūkahau'ūla (summit) at the top center, and Pu'u Makaanaka in the Distance.

Macdonald 1946) or the Hāmākua Group (Porter 1979). The most recent stage of volcanism consists of andesitic lavas (Macdonald and Abbott 1970:142; Sherrod et al. 2007; Wolfe and Morris 1996; Wolfe et al. 1997) called the Laupāhoehoe Volcanic Series (Stearns and Macdonald 1946) or the Laupāhoehoe Group (Porter 1979). Even though the last eruption occurred sometime between 4,580 and 8,200 years ago (Sherrod et al. 2007:470), the U.S. Geological Survey (USGS) considers Mauna Kea to be an active post-shield volcano (U.S. Geological Survey 2002).

## 2.2 CLIMATE, HYDROLOGY, AND FLORA

The climate at Halepōhaku is dry and cool, with an annual mean rainfall of approximately 25 inches (635 millimeters) and a temperature range of between 30° and 70°F (Giambelluca et al. 2014). Precipitation in the form of snow is rare at Halepōhaku. Prevailing winds are from the northeast. There are no permanent streams on the south flank of Mauna Kea, and the nearest sources of permanent water are springs and seeps located in Waikahalulu Gulch (Wentworth and Powers 1943). The summit region is dry and cold with little difference in the mean minimum and mean maximum temperature ranges throughout the year. Precipitation at the summit averages approximately 204 mm (8.0 inches) per year ( ). Prevailing winds at the summit are from the east-northeast.

Halepōhaku is situated at the transitional zone between two overlapping vegetation communities: sub-alpine xerophytic scrubland and the *mamane* (*Sophora chrysophylla*) parkland. The scrubland is characterized by *pukiawe* (*Styphella tameiameia*), *noho-anu* (*Geranium cuneatum*), *'ohelo* (*Vaccinium reticulatum*), and *na'ena'e* (*Raillardia ciliolata*). The parkland is dominated by *mamane* and *'aheahea* (*Chenopodium oahuense*)

## 3.0 HISTORICAL BACKGROUND

McEldowney (1982), Langlas (Langlas et al. 1997; Langlas 1999), Maly (Maly 1998, 1999; Maly and Maly 2005), and McCoy and Nees (2010) have summarized the traditional culture history, traditions, historical accounts, oral histories, and spiritual significance of Mauna Kea's summit region through early journal accounts, maps, ethnographic collections, Boundary Commission testimonies, and oral interviews. McCoy and Nees (2010) summarized the cultural history and previous archaeological work on Mauna Kea. The overview that follows is based on these studies, which should be consulted for more detail.

### 3.1 PLACE NAMES, MYTHS, LEGENDS, AND TRADITIONAL HISTORIES

Place names in the Mauna Kea summit region are a mix of traditional and modern nomenclature. Mauna Kea has been interpreted literally as White (Kea) Mountain (Mauna), but also as a reference to the union between the gods Wākea and Papa that formed the mountain (Ellis 1979:292). In an account and *mele* of Queen Emma's trip to Lake Waiau in 1881 or 1882, de Silva and de Silva (2007) present details about the names of the mountain and Lake Waiau:

Although Maunakea is popularly translated as “white mountain,” Kea is also an abbreviated form of Wakea, the sky father who, with Papa, the earth mother, stands at the apex of Hawaiian genealogy. Mauna Wakea is thus viewed traditionally as the sacred meeting point of sky and earth, father and mother, Wakea and Papa. Emma's poets were well-acquainted with the older name and its lasting significance; they refer to Waiau as “ka piko on Wakea”—as the mountain's navel/genital/umbilical/connecting-point/center (de Silva and de Silva 2007: footnote 7).

The currently used name for the summit is Kūkahau'ula (“Kūkahau'ula of the red-hewed dew or snow”), instead of the formerly used Pu'u Wekiu, and refers to the legendary husband of Līlīnoe and an *'aumakua* (family deity) of fishermen (Hibbard 1999). Maly and Maly (2005:vi) give the name as Pu'u o Kūkahau'ula, which they say was “named for a form of the god Ku, where the *piko* of new-born children were taken to insure long life and safety.” According to Maly and Maly (2005:vi):

The name Pu'u of Kukahau'ula is the traditional name of the summit cluster of cones on Mauna Kea, appearing in native accounts and cartographic resources until c. 1932. The recent names, Pu'u Wekiu, Pu'u Hau'oki and Pu'u Haukea, have...been used since the 1960s (since the development of astronomy on Mauna Kea), and have displaced the significant spiritual and

cultural values and sense of place associated with the traditional name, Pu'u o Kukahau'ula.

The names Kūkahau'ula and Līlīnoe are both attributed to cinder cones in the summit region: Kūkahau'ula at the summit and Līlīnoe immediately southeast of the summit cluster. These names, along with that of Waiau, appear on Lyon's 1884 sketch map (Figure 4), and Līlīnoe and Waiau are repeated in the survey of the summit region conducted in 1892 by Alexander. Kūkahau'ula is given as the name of "the highest peak" even earlier in 1873 land boundary testimonies. Of the place names in the summit region, these three are applied the earliest and most consistently to specific landmarks on the mountain. In compiling the 1892 map of Mauna Kea, W.D. Alexander refers to these as "genuine native names."

Some contemporary Native Hawaiian cultural practitioners continue to view Mauna Kea as a first-born child of Papa and Wākea, and thus, the mountain is revered as "the *hiapo*, the respected older sibling of all Native Hawaiians" (Kanahale and Kanahale 1997 in Langlas 1999:7). Cultural practitioner Kealoha Piscotta explains that this link to Papa and Wākea "is the connection to our ancestral ties of creation" (Orr 2004:61). Pualani Kanaka'ole Kanahale states that "the very fact that it is the 'Mauna a Wākea' tells you that it is the *mauna* that is meeting Wākea" (Maly 1999:A-368).

Traditional genealogical *mele* and *mo'olelo* (stories, traditions) recount associations between Mauna Kea and Poli'ahu, Līlīnoe, Waiau, and Kahoupakane. In a *mo'olelo* recounting the travels of Pūpū-kani-'oe, it was said that Mauna Kea was a mountain "on which dwell the women who wear the *kapa hau* (snow garments)" (Maly and Maly 2005:31). Another *mo'olelo*, which dates to the 1300s, explains that Ka-Miki was sent atop Mauna Kea's summit to the royal compound of Poli'ahu, Līlīnoe, and their ward, Kapi-o-Waiiau, to fetch water for use in an 'ai-lolo ceremony (Maly and Maly 2005:42-43).

In 1931, Emma Ahu'ena Taylor, a historian of Hawaiian descent with genealogical ties to the lands of Waimea and Mauna Kea, reported on Poli'ahu's residence at Mauna Kea, but also described the creation of Lake Wai'au. She wrote:

Poli'ahu, the snow-goddess of Mauna-kea, was reared and lived like the daughter of an ancient chief of Hawaii. She was restricted to the mountain Mauna-kea by her godfather Kane. She had a nurse Lihau who never left her for a moment. Kane created a silvery swimming pool for his daughter at the top of Mauna-kea. The pool was named Wai-au. The father placed a supernatural guard [Mo'o-i-nanea] at that swimming pool so that Poli'ahu could play at leisure without danger of being seen by a man... (Maly and Maly 2005:53).

According to Taylor, on Mauna Kea, Poli'ahu's attendants Līlīnoe, Lihau, and Kipu'upu'u drove away her suitor, Kūkahau'ula (the pink-tinted snow god). But Mo'o-i-nanea allowed the snow god to embrace Poli'ahu, and to this day, Taylor reports, "Ku-kahau-ula, the pink snow god, and Poli'ahu of the snow white bosom, may be seen embracing on Mauna-kea" (Maly and Maly 2005:53).

Of the several place names in the vicinity of Halepohaku, Pu'u Kalepeamoā (lit. the comb by a chicken) is the only one to appear on early government survey maps and in the literature on late nineteenth century expeditions to the summit (Figure 4). The Mauna Kea-Humuula trail, first plotted by Alexander in 1892, is shown passing near or through the Halepohaku area.

### 3.2 LAND USE

The summit of Mauna Kea is located in Ka'ohe Ahupua'a, Hāmākua District. Ka'ohe is a large *ahupua'a* found in what Lyons referred to as the "almost worthless wastes of interior Hawaii:"

Then there are the large ahupuaas which are wider in the open country than the others, and on entering the woods expand laterally so as to cut off the smaller ones, and extend toward the mountain till they emerge into the open interior country; not however to converge to a point at the tops of the respective mountains. Only a rare few reach those elevations, sweeping past the upper ends of all the others, and by virtue of some privilege in bird-catching, or some analogous right, taking the whole mountain to themselves...The whole main body of Mauna Kea belongs to one land from Hamakua, viz., Kahohe, to whose owners belonged the sole privilege of capturing the *ua'u*, a mountain-inhabiting but sea-fishing bird.



These same lands generally had the more extended sea privileges. While the smaller ahupuaas had to content themselves with the immediate shore fishery extending out not further than a man could touch bottom with his toes, the larger ones swept around outside of these, taking to themselves the main fisheries much in the same way as that in which the forests were appropriated. Concerning the latter, it should here be remarked that it was by virtue of some valuable product of said forests that the extension of territory took place. For instance, out of a dozen lands, only one possessed the right to *kalai wa`a*, hew out canoes from the koa forest. Another land embraced the *wauke* and *olona* grounds, the former for kapa, the latter for fish-line (Lyons 1875:111).

The boundaries of Ka`ohe, as shown on modern maps, are open to question. A map of the adjoining Humu`ula Ahupua`a made by S.C. Wiltse in 1862 (Hawaii State Archives Register Map No. 668) included the adze quarry and Lake Waiau, which was labeled on the map as "Pond Poliahu." Maly and Maly (2005:280-287) note that

By the time the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them in 1874, disputes over the boundary of Humu`ula and Ka`ohe had arisen...[and]...by the time of settlement in 1891, the boundary of Humu`ula was taken down to around the 9,000 foot elevation, with Ka`ohe taking in the entire summit region.

The testimony of Kahue of Humu`ula, presented in Maly and Maly (2005:287), mentions the boundary running from a gulch called Kahawai Koikapue, where *mele* were sung, to Waiau and then to the summit which was called Pu`uokūkahu`ula. Parenthetically, there is a note that "half of the water in the gulch belonging to Ka`ohe and half to Humu`ula."

In addition to the district and *ahupua`a* system of land tenure, there were other traditional land classifications, including one that employed the term *wao* for a series of natural and cultural zones (Malo 1951:16-18). According to some descriptions, the *wao kanaka* was a low-lying coastal area where the *maka`āinana* were free to move and inhabit. The *wao kele* was the upland forested area that the *maka`āinana* could only access for gathering purposes. The *wao akua*, which was believed to be inhabited by *akua*, was the subalpine desert region above the tree line. The *maka`āinana* were hesitant to venture into the *wao akua* and could do so only by offering prayer and displaying great respect (NASA 2005:3-18, 3-19).

The Mauna Kea summit region is commonly described today as lying within the *wao akua*, which is different, however, from Malo's description of this zone which placed it at a lower elevation in forested lands (Malo 1951:17). As noted in the footnotes to Malo's *Hawaiian Antiquities* (Malo 1951:18), *wao akua* can also be understood to mean "a remote desolate location where spirits, benevolent or malevolent, lived and people did not live. Usually these places were deep interior regions, inhospitable places such as high mountains, deserts and deep jungles. These areas were not necessarily *kapu* but were places generally avoided out of fear or respect" (PHRI 1999, 24). When Rev. William Ellis toured Hawai'i Island in 1823, he noted the reluctance of native Hawaiians to venture into the summit areas of Mauna Kea:

...numerous fabulous tales relative to its being the abode of the gods, and none ever approach the summit--as, they say, some who have gone there have been turned to stone. We do not know that any have been frozen to death; but neither Mr. Goodrich, nor Dr. Blatchely and his companion, could persuade the natives, whom they engaged as guides up the side of the mountain, to go near its summit (Ellis 1979:292).

Although the *ahupua`a* system (including *kapu* restrictions) of land and resource management no longer exists legally, knowledge of some traditional *kapu* have been passed down and endure. In Maly (1999: A-371), Pualani Kanaka`ole Kanahale stated that she learned from her *kūpuna* that the forested regions are not the realm of humans but rather that the forest's *kupa* (citizens) are the trees. Kanahale notes that "when I go *maha`oi* [intrude] in their realm, I have to ask permission to be up there." Likewise, Irene Lindsey-Fergerstrom indicated that in the context of taking *piko* up to the Mauna Kea summit, that her *tūtū* (grandmother) had knowledge of the *kapu* restriction that only *ali`i* were permitted on the summit (Maly 1999:A-390).

During pre-Contact times, the slopes of Mauna Kea, above the limits of agriculture and permanent settlement, were a vast montane "wilderness" probably known to only a small number of Hawaiians

engaged in primarily “special purpose” activities such as bird-catching, canoe making, stone-tool manufacture, or burial of the dead (McEldowney 1982); ethnographic information relating to specific activity localities is generally lacking although archaeological evidence provides some evidence of past land use in the form of adze production (primarily at the Mauna Kea Adze Quarry but elsewhere as well), human burial, and the erection of shrines.

Early post-Contact ascents of Mauna Kea by Europeans and Hawaiians occurred throughout the nineteenth century, including Queen Emma’s famous visit to Lake Waiau in 1881 or 1882 (de Silva and de Silva 2007). de Silva and de Silva (2007:5) note that

the historical record of pilgrimages to Maunakea is not limited to Emma’s mele and Phillips’s mo’olelo. Steve Desha writes, that as a young man, Kamehameha Pai’ea went to Waiau to pray and leave an offering of ‘awa. Kamakau tells us that Ka’ahumanu made the same journey in 1828 in an unsuccessful attempt to retrieve the iwi of her ancestress Lilinoe. Kauikeaouli visited Waiau and the summit in 1830, Alexander Liloiliho in 1849 and Peter Young Ka’eo in 1854.

### **3.2.1 PRE-CONTACT PERIOD LAND USE**

While the summit region was known and accessible to early Hawaiians, the only activity that is known with certainty to have occurred during the pre-contact period is the manufacture of stone adzes. Radiocarbon dates on wood charcoal and 230 Thorium dates on branch coral indicate that the adze quarry was in use over a period of possibly as much as 700 years between ca. A.D. 1100 and 1800 (McCoy 1986:Figure 28; 1990:Figure 4), although a shorter chronology of perhaps just 500 years now seems more likely. When the quarry was abandoned is unknown and may never be known with any certainty, but there is some evidence that it may have occurred as late as European contact in 1778 or shortly thereafter.

An interesting account of the adze quarry was published by Brigham at the turn of the 20th century:

Let us climb to the workshop of the adze maker. All these were in high places, and one on Mauna Kea, Hawaii, was nearly 12,900 ft. above the sea. As good clinkstone was not found in many places the known quarries hardly exceeded half-a-dozen. On Hawaii was the most important of all, that on Mauna Kea, where the workmen could only work in favorable seasons for the snow frequently covered the quarry, but from the immense quantity of fragments and chips the work must have extended over many generations; so far as known, this was the earliest quarry exploited, and it is puzzling how the place was discovered when we consider the aversion the Hawaiians had to even visiting those high, bleak and desert regions, the supposed abode of spirits not always friendly. It is possible that the tradition which speaks of the survivor of the deluge of Kahinalii grounding on Mauna Kea and following the receding waters to the lower levels, discovering the koi pohaku on the way, may point to the considerable antiquity of adze-making in this place, but I am inclined to believe that all traditions of the Hawaiian deluge date after the coming of the Spanish discoverers. It has always seemed strange that the axe-makers did not bring the raw material down to their homes and work it up in comfort instead of freezing in their kapa garments at this great altitude. It may be that the mystery of the place and its very solitude kept the trade in few hands and so enhanced the value of a tool that so many must have (Brigham 1902:75-76).

### **3.2.2 POST-CONTACT PERIOD LAND USE**

Changes to traditional Hawaiian lifeways began soon after the arrival of Captain James Cook in 1778. One significant change was the rapid adoption of Western tools, clothing and other items, initially by the chiefs and subsequently by commoners. The impact on traditional technologies is known in a general way from historic accounts, such as diaries and newspapers, but for remote centers of traditional crafts, such as the Mauna Kea Adze Quarry, there is little or no information on how long they continued to be utilized before abandonment.

The first recorded ascent of Mauna Kea by a European was made by the Rev. Joseph Goodrich on August 26, 1823 (Goodrich 1833:200). A number of visits followed shortly thereafter, including ones by

such prominent figures as the renowned botanist David Douglas (see Maly and Maly 2005 for a comprehensive overview of early visits and expeditions to the top of Mauna Kea). Macrae mentions that Goodrich found a “heap of stones” on a cinder cone which many have interpreted as located on the summit. Macrae’s description suggests a cinder cone at a lower elevation on the edge of the summit plateau:

Rev. Joseph Goodrich, who, on this occasion, was unfortunately laid up with mountain sickness, had on 26th August, 1823, reached the summit of Mauna Kea. This is the first recorded instance of the ascent of this mountain, although Mr. Goodrich mentions that on reaching the top of one of the terminal cones that encircle the main plateau of Mauna Kea, he discovered a heap of stones, probably erected by some former visitor. Who this former visitor was is unknown, but he was probably one of the white men that in the early years of the nineteenth century got a living by shooting wild bullocks that roved on the side of Mauna Kea. It is very unlikely that any native had reached the top of the terminal cones on the summit, owing to being unprovided with warm clothing to resist the great cold and also to the fact that the natives had a superstitious dread of the mountain spirits or gods. About six months after the date of the first ascent of Mauna Kea by Mr. Goodrich, the peak was scaled by Dr. Abraham Blatchley and Mr. Samuel Ruggle, both connected with the American Mission (Macrae 1922:55).

The early 20th century marked the beginning of a new era in the land use history of Mauna Kea. Large numbers of wild sheep were devastating the forests below the summit in the early part of the century. The extent of the devastation was the impetus for a monumental fencing program undertaken by the CCC in the 1930s. The CCC was also engaged at the same time in improving roads and building facilities for visitors. In 1936 the CCC made improvements to what is believed to have been a section of the old Mauna Kea-Humu`ula Trail, from near the Humu`ula Sheep Station at Kalaieha to the summit (Bryan 1939:11). According to Bryan (1939:11), the first stone cabin, from which Halepōhaku takes its name (Hale Pōhaku-“House of Stone”), was built by the CCC about this same time. Prior to the construction of a road above Ho`okomo, the cabin at Halepōhaku provided a convenient overnight rest spot for hikers and ski enthusiasts (McCoy 1984:8).

#### 4.0 PREVIOUS ARCHAEOLOGY

Ten archaeological investigations have been conducted at or near Halepōhaku, including an archaeological inventory survey³ conducted for the proposed project; no historic properties have been recorded within the proposed telescope location (Figure 5). Four significant historic properties are located within approximately 100 meters of the proposed telescope location, but would not be adversely impacted by the proposed undertaking:

- SIHP 50-10-23-10314; pre-Contact traditional lithic scatter
- SIHP 50-10-23-09074; historic Halepōhaku Rest House 1
- SIHP 50-10-23-09075; historic Halepōhaku Rest House 2; and
- SIHP 50-10-23-09076; historic Halepōhaku Comfort Station

In 1979, a one-day reconnaissance survey of the Halepōhaku area was conducted for the “Hale Pohaku Mid-Level Complex Development Plan.” No archaeological sites were recorded (McCoy 1979).

Three more surveys were conducted between July 1984 and June 1985 as part of the preparation of a supplemental Environmental Impact Statement (EIS) for a permit to build a new construction laborer camp (McCoy 1985a, 1991). Seven noncontiguous historic properties (five lithic scatters and two shrines) were recorded on both sides of the Mauna Kea Observatory Access Road and were collectively designated as the Pu`u Kalepeamoia Site complex (Statewide Inventory of Historic Places [SIHP] 50-10-23-16244). No formal boundary was defined for Site 16244 and it appears that the limits coincide with the collective extent of individual properties (McCoy 1991); each property was also assigned an SIHP number. Two of the properties (SIHP Sites 10310 and 10311 [both lithic scatters]) are located more than 275 meters south of

---

³ The archaeological inventory survey was conducted in accordance with Hawaii Revised Statutes (HRS) Chapter 6E, and Title 13 of the Hawaii Administrative Rules (HAR), Subtitle 13, Chapter 276.

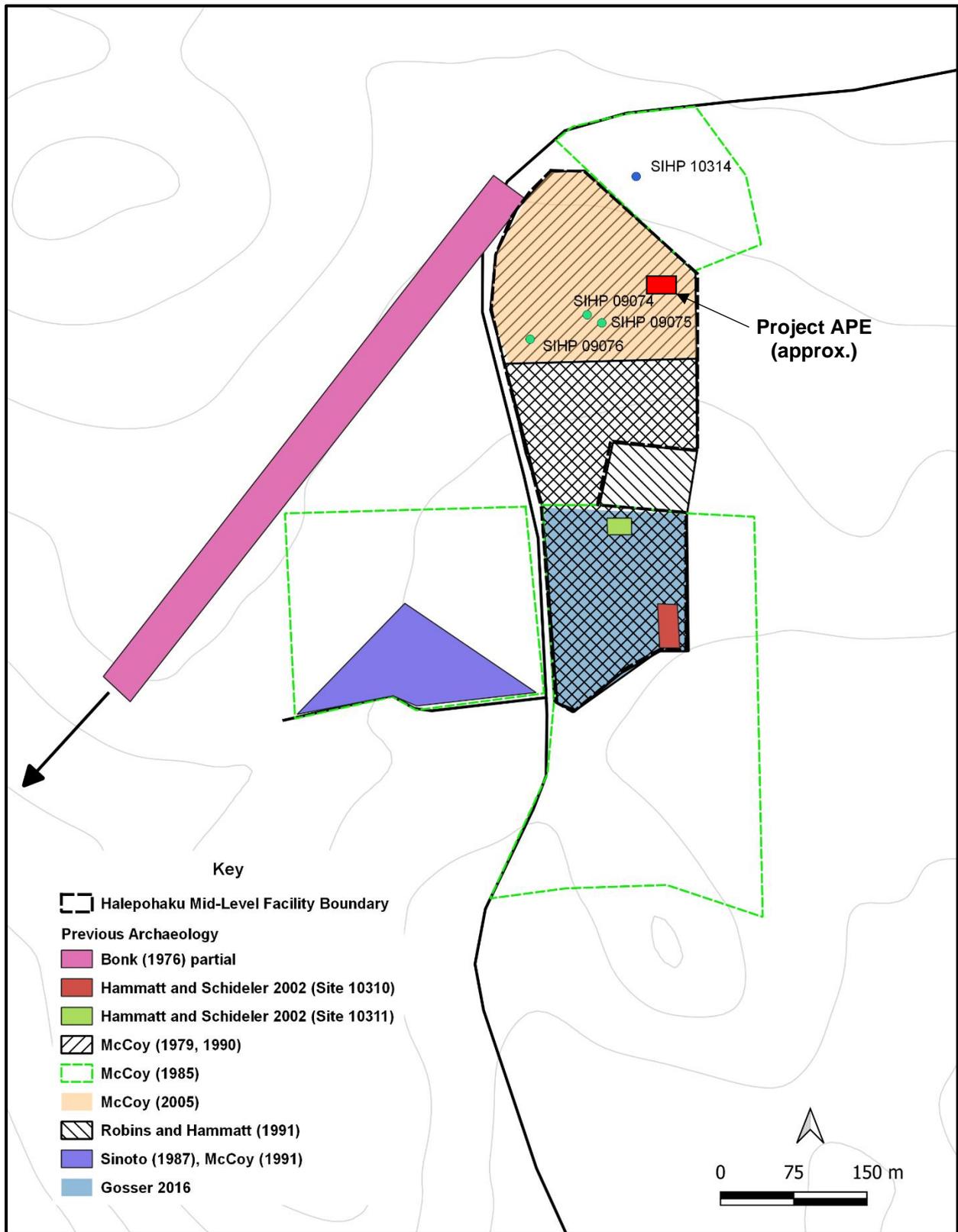


Figure 5. Location of Previous Archaeological Projects.

the project area. As noted above, SIHP Site 10314 (lithic scatter) is located approximately 100 m north of the project area.

In 1986, Bonk (Bonk 1986) conducted a reconnaissance survey of a proposed new HELCO transmission line and substation located at Halepōhaku. No historic sites were found during the survey, which extended from an existing 69 KV powerline north of the Saddle Road and west of the Mauna Kea Access Road to the substation location at Halepōhaku.

The subsequent discovery of lithic artifacts in the vicinity of the HELCO substation led to a data recovery project that involved additional survey and surface collections at 11 different lithic scatters and limited test excavations of two of the scatters (Sinoto 1987; McCoy 1991). A total of 2,364 artifacts and 129 faunal remains were collected. In addition to the debris related to adze and octopus sinker manufacture, 20 special purpose bird cooking stones called *pohaku`eho* were recovered. Three radiocarbon dates from charcoal recovered in fire pits indicate that the site, which has been interpreted as a temporary camp occupied for the ascent to and descent from the Mauna Kea Adze Quarry, is of late pre-contact age (ca. AD 1600-1700).

In 1990, a reconnaissance survey at Halepōhaku was conducted in conjunction with the proposed construction of dormitories for the Japan National Large Telescope (later renamed the Subaru Telescope). The survey covered the southern portion of the area surveyed by McCoy (1985a) and relocated two lithic scatters, which were recommended for data recovery investigations (Robins and Hammatt 1990). The data recovery excavations were conducted in 1993; radiocarbon dates from the project confirmed a late pre-Contact occupation of the area (Hammatt and Shideler 2002).

In 2005, archaeological monitoring was conducted during the installation of four septic tank at Halepōhaku (McCoy 2005). No historic properties or subsurface archaeological deposits were recorded within the current project area during the monitoring.

In 2016 (Gosser 2016), an archaeological survey was conducted near the Visitor Information Station as part of infrastructure improvements. No new historic properties were recorded, although several isolated artifacts were observed.

#### **SIHP SITE 50-10-23-10314**

SIHP Site 10314 is one of several sites comprising the Pu`u Kalepeamoia Site Complex (McCoy 1991). The site is characterized as a lithic scatter that includes adze and octopus lure sinker manufacturing by-products and other artifacts possibly used in other activities, such as wood-working (McCoy 1991). SIHP Site 10314 covers approximately 2,000 m². Most of the artifacts were found in a single concentration at the base of a clump of living and dead *mamane* trees situated on what is believed on one of the dunelike bodies of reworked Pu`u Haiwahine tephra (McCoy 1985b).

The site was re-visited in June of 1985 at which time it was noted that the area had been recently disturbed. Because of the potential for more damage, surface artifacts were collected from the most vulnerable areas. A total of 44 artifacts were mapped and collected in an area covering 9 m² (McCoy 1985b). The majority of the artifacts are dunite and gabbro cored bomb fragments related to the manufacture of octopus lure sinkers and manufacturing tools, which were called fabricators. The concentration contained only two basalt waste flakes from adze manufacture (McCoy 1991). Since 2012, SIHP Site 10314 has been visited annually to assess changes. While some natural erosion has exposed additional lithic material, the site has remained undisturbed.

#### **SIHP SITES 50-10-23-09074, 09075, AND 09076 (THE HALEPŌHAKU REST CAMP AND COMFORT STATION)**

The Halepōhaku Rest Camp and Comfort Station comprises three buildings immediately south of the Halepōhaku Mid-Level Support Facility. The buildings were constructed between 1936 and 1950; SIHP Sites 09074 and 09075 (Rest Camp) were constructed by the Civilian Conservation Corps between 1936 and 1939, while SIHP 09076 (comfort station) was constructed in 1950 by the Territory of Hawai`i's Division of Forestry.

The three buildings of the Halepōhaku Comfort Station and Comfort Station have individually recommended as eligible for the National Register of Historic Places (NRHP) and Hawaii's State Register

of Historic Places under Criterion A and Criterion C. These historic properties are associated with events that have made a significant contribution to the broad patterns of history, thus fulfilling Criterion A. These properties also embodies the distinctive characteristics of a type, period, or method of construction, thus fulfilling Criterion C.

### **3.0 FIELD SURVEY**

On 18 October 2019 PCSI conducted a pedestrian field survey of approximately 5,420 square feet (0.12 acres) of area that included the APE area for the proposed telescope building footprint (Figure 6). The ground surface has been heavily modified by a dirt access road, the installation of a septic system (see Figure 2), and use of the area for equipment storage. No historic properties or surface archaeological deposits were recorded during the survey. A *mamane* tree is present to the east of the APE.

### **4.0 ANTICIPATED FINDS**

Based on multiple archaeological projects within the APE that have included both surface and subsurface scrutiny, it is anticipated that no above-ground archaeological resources will be recorded during the proposed Halepōhaku educational telescope project. It is unlikely that subsurface archaeological deposits or human burials will be present within the APE.

### **5.0 PROJECT IMPACT ASSESSMENT**

While no above-ground archaeological properties will be impacted by the proposed project and no subsurface archaeological deposits were recorded during the installation of Cesspool # 2 (within the APE of the proposed project), there is a possibility of subsurface deposits in the area based on the recording of several non-contiguous archaeological sites near the proposed project.

#### **5.1 CONSULTATION**

In an effort to more completely understand the cultural and historical background within and around the project area and bring as much information to bear on the decision-making process for this project, PCSI sought community input. Sixty-eight entities (community members, community groups, and State agencies) were sent letters (66 by email and two by post) asking for input concerning historic sites located in or near the project area, as well as cultural traditions, legends, and traditional cultural places and practices pertaining to the area. In addition, the letter provided a link to a website where more background information was provided. The 68 entities were identified by OMKM primarily through interactions as part of previous undertakings within University of Hawaii managed lands on Mauna Kea.

Four responses were returned. None of the responses provided specific information concerning historic properties, cultural resources, or traditional practices within the project area but did provide commentary and recommendations to strengthen the historic preservation documents associated with the project.

#### **5.2 DETERMINING EFFECTS TO SIGNIFICANT HISTORIC PROPERTIES (HAR §13-275-7)**

Based on the results of research and consultation, it is recommended that the effect determination for this project is “No historic properties affected.” However, because the proposed project will include ground disturbance in an area near where non-contiguous archaeological deposits have been recorded, it is recommended that a commitment be made to monitor (with an SHPD-approved monitoring plan) ground-disturbing activities during construction.

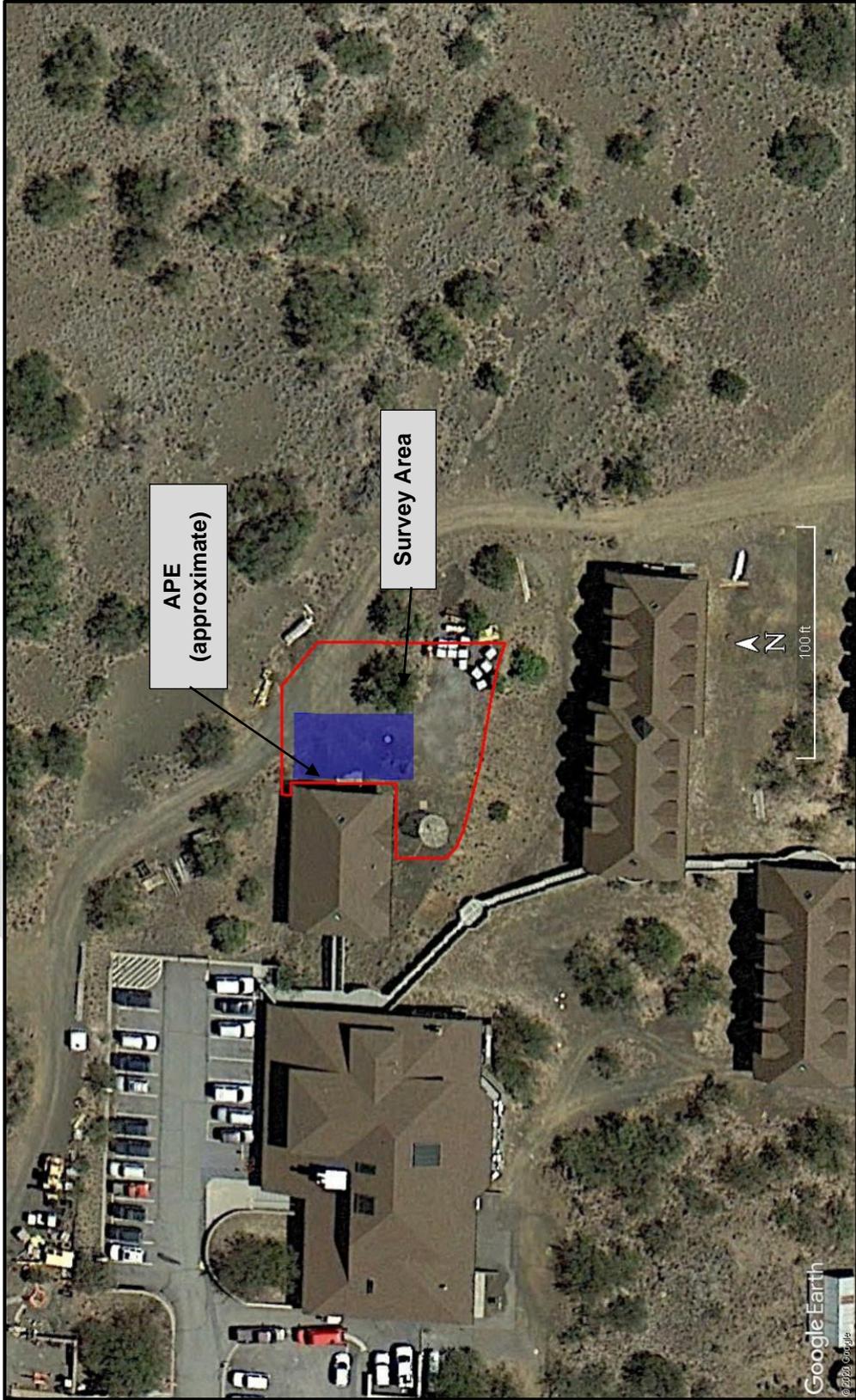


Figure 6. Extent of Field Inspection and Approximate APE.

## 6.0 REFERENCES

- Bonk, William J.  
1986 An Archaeological Survey at the Middle Level, Southern Flank of Mauna Kea, Hawaii. *Papers in Ethnic & Cultural Studies* 86-2.
- Brigham, W. T.  
1902 *Stone Implements and Stone Work of the Ancient Hawaiians*. Memoirs of the B.P. Bishop Museum, Vol. 14, No. 4. Bishop Museum Press, Honolulu.
- Collins, Sara L., and Patrick McCoy  
2014 *Final Report: Burial Treatment Plan for Burial Sites in the Mauna Kea Science Reserve and the Mauna Kea Access Road Corridor, Ka'ohē Ahupua'a, Hamakua District, Hawaii Island TMK (3)4-4-015:009 and (3)4-4-015:por. 001*. Prepared for the Office of Mauna Kea Management by Pacific Consulting Services, Inc., Honolulu.
- CMP (Comprehensive Management Plan)  
2009 *Mauna Kea Comprehensive Management Plan UH Management Areas*. Manuscript on file at SHPD, Kapolei.
- DePaolo, D.J., and E.M. Stolper  
1996 Models of Hawaiian Volcano Growth and Plume Structure: Implications of results from the Hawaii Scientific Drilling Project. *Journal of Geophysical Research* 101(B5):11643-11654.
- de Silva, Kihei, and Mapuana de Silva  
2007 *E Ho'ka Nani I Mana*. Ka'iwakiloumoku-Hawaiian Cultural Center, University of Hawaii at Manoa, Honolulu. 8/2/2007. <http://hccp.ksbe.edu/kaleinamanu/8-ehoikanani.php>.
- Ellis, William  
1979 *Journal of William Ellis: Narrative of a Tour of Hawaii, or Oowhyee; with Remarks on the History, Traditions Manners, Customs, and Language of the Inhabitants of the Sandwich Islands*. Charles E. Tuttle Company, Inc. Rutland, Vermont.
- Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger.  
2014. Evapotranspiration of Hawai'i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai'i.
- Goodrich, Joseph  
1826 Notice of the Volcanic Character of the Islands of Hawaii. *American Journal of Science* Ser. 1, 11:2-7.  
1833 In "Letters to the Editor." *American Journal of Science* 25:199-20.
- Gosser, Dennis, Stephan D. Clark, and Richard C. Nees  
2014 *Long-Term Historic Property Monitoring Plan for the Three University of Hawaii Management Areas on Mauna Kea, Ka'ohē Ahupua'a, Hāmākua District, Hawai'i Island, State of Hawai'i*. Manuscript on file at SHPD, Kapolei.
- Hammatt, Hallett H., and David W. Shideler  
2002 Data Recovery Report for Two Archaeological Lithic Scatters, Sites 50-10-23-10,310 and 50-10-23-10,311 at The Pu`u Kalepeamoā Complex, Hale Pohaku, Ka`ohē Ahupua`a, Mauna Kea, Hawaii Island (TMK 4-4-15:12). Prepared for The Institute for Astronomy, University of Hawaii.
- Hibbard, Don  
1999 Letter of May 3, 1999 to Dr. Robert McLaren (IfA) Regarding Historic Preservation Review of the Proposed W.M. Keck Outrigger Telescopes Project.
- Kamakau, Samuel M.  
1961 *The Ruling Chiefs of Hawaii*. Kamehameha Schools/Bishop Estate. Honolulu.  
1976 *The Works of the People of Old (Na Hana a ka Po'e Kahiko)*. Bernice P. Bishop Museum Special Publication 61.

- Kanahele, P.K., and Edward L.H. Kanahele  
 1997 *A Hawaiian Cultural Assessment of the Proposed Saddle Road Alignments. Project A-AD-6(1), Hilo, Hawaii.*
- Langlas, Charles  
 1999 *Supplement to Archaeological, Historical and Traditional Cultural Property Assessment for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR200) Project.*
- Langlas, Charles, Thomas R. Wolforth, James Head, and Peter Jensen  
 1997 *Archaeological Inventory Survey and Historical and Traditional Cultural Property Assessment for the Hawai'i Defense Access Road A-AD-6(1) and Saddle Road (SR200) Project, Districts of South Kohala, Hamakua, North Hilo and South Hilo, Island of Hawai'i.* Paul H. Rosendahl Ph.D., Inc., Hilo. Prepared for RUST Environmental and Infrastructure Inc., Phoenix, Arizona.
- Lyons, C.  
 1875 Land Matters in Hawaii. *The Islander* 1:1-33.
- Macrae, James  
 1922 *With Lord Byron at the Sandwich Islands*, edited by W.F. Wilson. Honolulu.
- Macdonald, Gordon A., and Agatin T. Abbott  
 1970 *Volcanoes in the Sea: The Geology of Hawaii.* University of Hawaii Press, Honolulu.
- Malo, David  
 1951 *Hawaiian Antiquities.* Bernice P. Bishop Museum Special Publication 2. Second Edition. Bishop Museum Press, Honolulu.
- Maly, Kepa  
 1998 "Mauna Kea—Kuahiwi Ku Ha'o Malie." A Report on Archival and Historical Documentary Research, Ahupua'a of Humu'ula and Ka'ohe, Districts of Hilo and Hamakua, Island of Hawai'i. Kumu Pono Associates. Hilo.  
 1999 "Mauna Kea Science Reserve and Hale Pohaku Complex Development Plan Update: Oral History and Consultation Study, and Archival Literature Research. Ahupua'a of Ka'ohe (Hamakua District) and Humu'ula (Hilo District), Island of Hawai'i. In *Mauna Kea Science Reserve Master Plan* (Appendix I), Group 70 International, Inc. Honolulu.
- Maly, Kepa, and Onaona Maly  
 2005 *Mauna Kea—Ka Piko Kaulana o Ka 'Aina (Mauna Kea—The Famous Summit of the Land: A Collection of Native Traditions, Historical Accounts, and Oral History Interviews for: Mauna Kea, the Lands of Ka'ohe, Humu'ula and the 'Aina Mauna on the Island of Hawai'i.* Prepared for the Office of Mauna Kea Management. Kumu Pono Associates LLC. Hilo.
- McCoy, Patrick C., and Richard C. Nees  
 2010 *Archaeological Inventory Survey of the Mauna Kea Science Reserve Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i TMK: (3) 4-4-015: 09 (por.).* Manuscript on file at SHPD, Kapolei.
- McCoy, Patrick  
 1977 The Mauna Kea Adz Quarry Project: A Summary of the 1975 Field Investigations. *Journal of the Polynesian Society* 86(2):233-244.  
 1979 Letter Report Dated August 22, 1979 to Mr. Francis Oda on archaeological reconnaissance survey of two alternative locations for the Proposed Mauna Kea Mid-Elevation Facilities. Department of Anthropology, Bishop Museum.  
 1984 Mauna Kea Summit Region Survey: A Summary of the 1984 Fieldwork. Ms. on file at the Department of Anthropology, Bishop Museum.  
 1985a Biogeoclimatic Factors of Production in a Hawaiian Alpine Desert AdzeQuarry. Paper Presented at the 50th Annual Meeting of the Society for American Archaeology, Denver, Colorado.  
 1985b Preliminary Archaeological Survey of the Pu`u Kalepeamo Site, Mauna Kea, Hawaii. Appendix C of the Amendment to the Mauna Kea Science Reserve Complex Development Plan. Draft

- Supplemental Environmental Impact Statement for Construction Camp Housing at Hale Pohaku, Hamakua, Hawaii. University of Hawaii.
- 1986 Archaeological Investigations in the Hopukani and Lilo Springs Area of the Mauna Kea Adze Quarry, Hawai'i: A Data Summary Report. Ms. on file at the Department of Anthropology, Bishop Museum.
- 1990 Subsistence in a "Non-Subsistence" Environment: Factors of Production in a Hawaiian Alpine Desert Adze Quarry. In *Pacific Production Systems: Approaches to Economic Prehistory*, edited by D.E. Yen and J.M.J. Mummery, pp. 85-119. Occasional Papers in Prehistory, No. 18, Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra.
- 1991 Survey and Test Excavations of the Pu'u Kalepeamo Site, Mauna Kea, Hawai'i. Prepared for Facilities Planning and Management Office, University of Hawaii. Ms. on file in the Department of Anthropology, Bernice P. Bishop Museum. Honolulu.
- 2005 Archaeological Monitoring of Four Septic Tank Excavations at the Mid-Level Facilities Located at Hale Pohaku, Mauna Kea, Ka'ohe, Hamakua. Island of Hawai'i (TMK: [3]:4-4-015:012. Prepared for the University of Hawaii Institute for Astronomy.
- McCoy, Patrick C., Sara Collins, and Stephan D. Clark  
 2009 *A Cultural Resource Management Plan for the University of Hawaii Management Areas On Mauna Kea, Ka'ohe, Hamakua, Island of Hawai'i*. Prepared for the Office of Mauna Kea Management.
- McEldowney, Holly  
 1982 Ethnographic Background of the Mauna Kea Summit Region. Report 1. In *Cultural Resources Reconnaissance of the Mauna Kea Summit Region*. Bishop Museum Department of Anthropology ms.
- Moore, James G., and D.A. Clague  
 1992 Volcano growth and the evolution of the island of Hawaii. *Geological Society of America Bulletin* 104(10):1471-1484.
- NASA (National Aeronautics and Space Administration)  
 2005 *Final Environmental Impact Statement for the Outrigger Telescopes Project*. Vols. 1 and 2. Washington, D.C.
- Orr, Maria  
 2004 *Cumulative Cultural Impact Study/Assessment, Desktop Study & Ethnographic Survey, NASA W.M. Keck Observatory Outrigger Telescopes, Mauna Kea, Kaohe & Humu'ula Ahupua'a, Moku of Hamakua & Hilo, Hawai'i*. Prepared for International Archaeological Institute, Inc. (IARII), National Aeronautics and Space Administration (NASA), Tetra Tech, Inc., and Science Applications International Corporation (SAIC).
- PHRI (Paul H. Rosendahl, Ph.D., Inc.)  
 1999 *Cultural Impact Assessment Study: Native Hawaiian Cultural Practices, Features, and Beliefs Associated with the University of Hawai'i Mauna Kea Science Reserve Master Plan Project Area*. Prepared for University of Hawaii Institute for Astronomy. In Mauna Kea Science Reserve Master Plan (Appendix N).
- Porter, Stephen C.  
 1979 Geological Map of Mauna Kea Volcano, Hawaii. The Geological Society of America, Inc.
- Robins, Jennifer, and Hallett H. Hammatt  
 1990 Archaeological Reconnaissance for Summit and Mid-Level Facilities for the Proposed Japan National Large Telescope. Prepared for MCM Planning, Honolulu.
- Sharp, W.D., and P.R. Renne  
 2003 The ⁴⁰Ar/³⁹Ar dating of a Core Recovered by the Hawaii Scientific Drilling Project (Phase 2), Hilo, Hawaii. *Geochemistry, Geophysics, Geosystems* 6 (No. Q04G17): doi:10.1029/2004GC000846).
- Sherrod, D.R., J.M. Sinton, S.E. Watkins, and K.E. Brunt

2007 *Geologic Map of the State of Hawaii*. U.S. Geological Survey Open-File Report 2007-1089.

Stearns, H.T., and G.A. Macdonald

1946 Geology and Ground-Water Resources of the Island of Hawaii. *Hawaii Division of Hydrography Bulletin* 9. Honolulu.

U.S. Geological Survey

2002 Mauna Kea: Hawaii's Tallest Volcano. From <http://hvo.wr.usgs.gov/volcanoes/maunakea>.

Wentworth, Chester K., and William E. Powers

1941 Multiple Glaciation of Mauna Kea, Hawaii. *Bulletin of the Geological Society of America*. 52:1193-1216.

Wolfe, Edward W., William S. Wise, and G. Brent Dalrymple

1997 *The Geology and Petrology of Mauna Kea Volcano, Hawaii—A Study of Postshield Volcanism*. U.S. Geological Survey Professional Paper 1557, Washington, D.C.

Wolfe, Edward W., and Jean Morris, Compilers

1996 *Geologic Map of the Island of Hawaii*. U.S. Geological Survey, Miscellaneous Investigation Series. Washington, D.C.

DRAFT

# Appendix D

---

## Targeted Soil Screen Report

*This page intentionally left blank.*

# TARGETED SOIL SCREEN REPORT

**UNIVERSITY OF HAWAI'I AT HILO  
NEW EDUCATIONAL TELESCOPE  
HALEPŌHAKU  
MAUNA KEA ACCESS ROAD, BIG ISLAND, HAWAI'I**

Prepared for:  
**SSFM INTERNATIONAL**  
99 Aupuni Street, Suite 202  
Hilo, Hawai'i 96720



**LEHUA ENVIRONMENTAL INC.**  
P.O. Box 1018  
Kamuela, Hawai'i 96743

September 24, 2020

## TABLE OF CONTENTS

1.0	CERTIFICATIONS AND LIMITATIONS.....	1
2.0	EXECUTIVE SUMMARY .....	2
3.0	INTRODUCTION/PURPOSE.....	4
4.0	METHODOLOGY .....	5
5.0	RESULTS.....	6
6.0	SUMMARY.....	7
7.0	REFERENCES .....	8

### TABLES

TABLE 1	SOIL SCREEN SURVEY RESULTS .....	APPENDIX I
---------	----------------------------------	------------

### APPENDICES

APPENDIX I:	TABLE OF RESULTS
APPENDIX II:	FIGURE 1: DU BOUNDARIES FOR SOIL SCREEN
APPENDIX III:	PHOTOGRAPH LOG 1: TARGETED SOIL SCREEN SURVEY
APPENDIX IV:	SOIL LABORATORY ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY FORMS

## LIST OF ACRONYMS

<	less than
%	percent
%R	percent recovery
bgs	below ground surface
COPC	chemicals of potential concern
DOH	State of Hawai'i Department of Health
DU	decision unit
DQO	data quality objective
EAL	Environmental Action Level
EPA	Environmental Protection Agency
ft	feet
g	gram
HEER	Hazard Evaluation and Emergency Response
HUD	Housing and Urban Development
IDW	investigation derived waste
in	inch
LEI	Lehua Environmental Inc.
mg/kg	milligrams per kilogram
MIS	multi-increment sampling
ND	not detected
PPE	personal protective equipment
RCRA	Resource Conservation Recovery Act
SBRC	Solubility/Bioavailability Research Consortium
USEPA	United States Environmental Protection Agency

## **1.0 CERTIFICATIONS AND LIMITATIONS**

---

Lehua Environmental Inc. (LEI) has completed this targeted soil screen for the University of Hawai'i at Hilo's New Educational Telescope Project located at Halepōhaku on Mauna Kea Access Road on Maunakea, Big Island, Hawai'i. LEI's findings and recommendations contained herein are based on research, site observations, government regulations and laboratory data, which were gathered at the time and location of the study. Opinions stated in this report do not apply to changes that may have occurred after the services were performed.

LEI has performed specified services for this project with the degree of care, skill and diligence ordinarily exercised by professional consultants performing the same or similar services. No other warranty, guarantee, or representation, expressed or implied, is included or intended; unless otherwise specifically agreed to in writing by both LEI and LEI's Client.

This report is intended for the sole use of SSFM International, exclusively for the Subject Site. SSFM International may use and release this report, including making and retaining copies, provided such use is limited to the particular site and project for which this report is provided. However, the services performed may not be appropriate for satisfying the needs of other users. Release of this report to third-parties will be at the sole risk of LEI's Client and/or said user, and LEI shall not be liable for any claims or damages resulting from or connected with such release or any third party's use or reuse of this report.



Prepared By: _____

Kamalana Kobayashi  
State of Hawai'i Certified Asbestos Inspector  
Certification #: HIASB-0613, Expires: 6/18/21  
State of Hawai'i Certified Lead Risk Assessor  
Certification #: PB-0132, Expires: 5/16/21

Date: _____

September 24, 2020

## **2.0 EXECUTIVE SUMMARY**

---

This report describes the results of LEI's targeted soil screen (Survey) for the University of Hawai'i at Hilo's New Educational Telescope Project located at Halepōhaku on Mauna Kea Access Road on Maunakea, Big Island, Hawai'i (Subject Site). All site work was completed on September 9, 2020 at the Subject Site.

### ***Project Scope and Objectives***

The objective of the Survey was to identify the presence (if any) of arsenic-, barium-, cadmium-, chromium-, lead-, selenium-, silver-, mercury-, and organochlorinated pesticide-contaminated soil within the planned areas of soil disturbance for the New Educational Telescope Project at the Subject Site, so that the information can be incorporated in the design. The results of the Survey were used to determine if these soils may pose a potential health risk to construction workers, building tenants and the general public during the renovation work at the Subject Site and to determine appropriate soil management and disposal practices, if needed.

### ***Summary of Multi-Increment Sampling Soil Screen Survey***

LEI's multi-increment sampling (MIS) soil screen at the Subject Site was conducted on September 9, 2020 and included a surface (0"-6" below ground surface (bgs)) and subsurface (6"-18" bgs) soils screen for the contaminants of potential concern (COPC) at the Subject Site with established Department of Health (DOH) Environmental Action Levels (EALs) to be disturbed during this project. Laboratory analytical results of the soil samples were used to determine if the surface and/or subsurface soils contain COPC that exceed applicable DOH Environmental Action Levels (EALs) for residential (unrestricted) and commercial/industrial (restricted) land use.

The Decision Units (DUs) at the Subject Site were based on the planned soil disturbance activities and included the below described areas. Figure 1 located in Appendix II identifies the DU locations on the site map.

- DU-1: Footprint of Planned Telescope, Walkway and Wall, 0"-6" bgs
- DU-2: Footprint of Planned Telescope, Walkway and Wall, 6"-18" bgs
- DU-3: Footprint of Planned Gate Areas, 0"-6" bgs
- DU-4: Footprint of Planned Gate Areas, 6"-18" bgs

### **RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) 8 METALS**

Total arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury were not detected in the surface and subsurface soil samples at concentrations that exceed the RCRA 8 metals DOH EALs for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is > 150 meters. Table 1 located in Appendix I summarizes the results for the Survey at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

## ORGANOCHLORINE PESTICIDES

Organochlorine pesticides were not detected in the surface and subsurface soil samples at concentrations that exceed the lead DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is > 150 meters. Table 1 located in Appendix I summarizes the results for the Survey at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

### *Summary and Conclusions*

In summary, the contaminants of potential concern were not identified above the Hawai'i Department of Health environmental action levels in the soils with planned disturbance for the University of Hawai'i at Hilo's New Educational Telescope Project at the Subject Site.

### **3.0 INTRODUCTION/PURPOSE**

---

LEI conducted a targeted soil screen for contaminants of potential concern within the soils of the Subject Site with planned disturbance activities for the University of Hawai'i at Hilo's New Educational Telescope Project at Halepōhaku on Mauna Kea Access Road on Maunakea, Big Island, Hawai'i.

The objective of the targeted soil screen was to identify the presence (if any) of arsenic-, barium, cadmium-, chromium-, lead-, selenium-, silver-, mercury-, and organochlorinated pesticide-contaminated soil within the planned areas of soil disturbance for the New Educational Telescope Project at the Subject Site, so that the information can be incorporated in the design. Specifically, LEI completed the following tasks:

- Performed site reconnaissance at the Subject Site;
- Identified a total of four (4) decision units within the Subject Site;
- Collected a total of six (6) multi-increment samples from the 4 decision units of the Subject Site, which included a duplicate and triplicate sample per the Hawai'i DOH recommendations. Each MIS included 50 sub-samples collected utilizing DOH recommended hand tools and equipment;
- Submitted the six (6) MIS soil samples to Hawaii Analytical Laboratories, LLC in Honolulu, Hawai'i for the following analysis:
  - MIS laboratory preparation
  - Total Arsenic, Lead, Barium, Cadmium, Chromium, Silver, and Mercury by Environmental Protection Agency (EPA) Method 6010B and 7471A
  - Selenium by EPA Method 6020B
  - Organochlorine Pesticides by EPA Method 8141A/B
- Prepared this report documenting the field activities and the results of the investigation including analytical results, photographs and recommendations.

## 4.0 METHODOLOGY

---

Multi-increment sample (MIS) soil sampling was chosen for the Subject Site so that reproducible data, representative of average background concentrations, can be obtained for use as reference control data. A total of four (4) decision units were identified at the Subject Site. Decision unit boundaries were based on the locations of the proposed site work and site characteristics (Figure 1, Appendix II). Each MIS soil sample consisted of 50 increments. Based on sampling theory (Pitard, 1993), a minimum of 30 increments per sample is generally recommended in order to obtain a reliable estimate of the mean concentration. The DOH typically specifies the use of 30 to 100 increments per sample in their Technical Guidance Manual (DOH, 2009b). Each increment was taken from 0-6 inches below ground surface for surface soils and from 6-18 inches below ground surface for subsurface soils. Samples were screened for arsenic-, barium-, cadmium-, chromium-, lead-, selenium-, silver-, mercury-, and organochlorinated pesticide.

The location of each increment was based on a systematic random grid that was developed during the site visit. The grid was drawn with a random starting point for even distribution across the sampling area. The systematic random sampling design provided coverage of the decision unit along a horizontal plane, without the gaps associated with purely random designs.

Each increment was taken and then placed into a double-bagged Ziploc[®] bag. This process was repeated until 50 increments were collected. MIS soil samples were then placed into a cooler with ice packs for delivery to the laboratory for analysis.

### *Equipment Decontamination*

All sampling equipment used to collect MIS samples were decontaminated prior to use between DUs. The decontamination procedure for sampling equipment is as follows:

1. Clean with distilled water and brush if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with distilled water.
3. Rinse thoroughly with Liquinox[™].
4. Rinse with distilled water.

### *Soil Sample Analysis*

The six (6) MIS soil samples were submitted to Hawaii Analytical Laboratories, LLC for multi-increment preparation and analysis via EPA Method 6010B arsenic-, barium-, cadmium-, chromium-, lead-, silver-, mercury-, EPA Method 6020B for selenium, and EPA Method 8141A/B for organochlorine pesticides.

## 5.0 RESULTS

---

The objective of the Survey was to identify the presence (if any) of arsenic-, barium-, cadmium-, chromium-, lead-, selenium-, silver-, mercury-, and organochlorinated pesticide-contaminated soil within the planned areas of soil disturbance for the New Educational Telescope Project at the Subject Site, so that the information can be incorporated in the design. The results of the Survey were used to determine if these soils may pose a potential health risk to construction workers, building tenants and the general public during the renovation work at the Subject Site and to determine appropriate soil management and disposal practices, if needed.

### RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) 8 METALS

Total arsenic, barium, cadmium, chromium, lead, selenium, silver and mercury were not detected in the surface and subsurface soil samples at concentrations that exceed the RCRA 8 metals DOH EALs for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is > 150 meters. Table 1 located in Appendix I summarizes the results for the Survey at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

### ORGANOCHLORINE PESTICIDES

Organochlorine pesticides were not detected in the surface and subsurface soil samples at concentrations that exceed the lead DOH EAL for unrestricted land use, where groundwater is a drinking water resource and the distance to the nearest surface water body is > 150 meters. Table 1 located in Appendix I summarizes the results for the Survey at the Subject Site. Additionally, Figure 1 located in Appendix II identifies the DU locations at the Subject Site.

## **6.0 SUMMARY**

---

In summary, the contaminants of potential concern were not identified above the Hawai'i Department of Health environmental action levels in the soils with planned disturbance for the University of Hawai'i at Hilo's New Educational Telescope Project at the Subject Site.

## 7.0 REFERENCES

---

- Code of Federal Regulations. Occupational Safety and Health Standards. Title 29, Part 1910 (1910.1000 TO END). Washington DC. US Government Printing Office, 2001.
- Code of Federal Regulations. Occupational Safety and Health Standards. Title 29, Part 1926.62. Washington DC. US Government Printing Office, 2001.
- Pitard, Francis F., 1993. Pierre Gy's Sampling Theory and Sampling Practice: Heterogeneity, Sampling Correctness, and Statistical Process Control. 2nd Ed. Boca Raton, FL: CRC Press.
- University of Wisconsin-Milwaukee, Department of Environmental Health, Safety and Risk Management website, <http://www.uwm.edu/Dept/EHSRM/HAZEXCEPTIONS/a.html>, 2000.
- Department of Health, Hazard Evaluation and Emergency Response (HEER) website, <http://www.Hawaii.doh.org/tgm.aspx>.
- State of Hawai'i, Department of Health. Update to Soil Action Levels for Inorganic Arsenic and Recommended Soil Management Practices (updates default, background arsenic soil action level presented in 2010 guidance to 24 mg/kg; arsenic exposure units in Section 3.0 table corrected to  $\mu\text{g}/\text{day}$  September 2012), November 2011 (updated September 2012).
- _____, 2009a. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Office of Hazard Evaluation and Emergency Response. March.
- _____, 2009b. Technical Guidance Manual for the Implementation of the Hawai'i State Contingency Plan. June.
- _____, 2011. Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater Honolulu. August.

# Appendix **I**

## **TABLE OF RESULTS**

Table 1. Soil Screen Sampling Results  
 University of Hawai'i at Hilo Educational Observatory  
 Halepōhaku, Maunakea, Hawai'i

Analyte	Laboratory Analytical Method	DOH EAL Unrestricted Land Use (mg/kg)	DOH EAL Commercial/Industrial Land Use (mg/kg)	Sample Location			Footprint of Planned Telescope, Walkway, and Wall (0"-6" bgs)		
				Descriptive Sample ID			DU-1		
				Result (mg/kg)	Laboratory Reporting Limit (mg/kg)	Pass/Fail	Result (mg/kg)	Laboratory Reporting Limit (mg/kg)	Pass/Fail
<b>RCRA 8 Metals</b>									
Arsenic (Total)	EPA 3051m/7061Am	24	95	2.8	1	Pass	2.8	1	Pass
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	ND	500	Pass	ND	500	Pass
Cadmium (Cd)	EPA 3051m/7000Bm	14	120	ND	9.9	Pass	ND	9.9	Pass
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	ND	79	Pass	ND	79	Pass
Lead (Pb)	EPA 3051m/7000Bm	200	800	43	40	Pass	66	40	Pass
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	Pass	ND	2	Pass
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	20	Pass	ND	20	Pass
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	4	Pass	ND	4	Pass
<b>Organochlorine Pesticides</b>									
4,4'-DDD	EPA 8081A	2.2	8.4	ND	0.02	Pass	ND	0.02	Pass
4,4'-DDE	EPA 8081A	1.9	8.2	ND	0.02	Pass	ND	0.02	Pass
4,4'-DDT	EPA 8081A	1.8	5.6	ND	0.02	Pass	ND	0.02	Pass
Aldrin	EPA 8081A	3.9	8.4	ND	0.02	Pass	ND	0.02	Pass
alpha-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
beta-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Chlordane (Technical)	EPA 8081A	17	23	ND	0.2	Pass	ND	0.2	Pass
delta-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Dieldrin	EPA 8081A	2.5	24	ND	0.02	Pass	ND	0.02	Pass
Endosulfan I	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass
Endosulfan II	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass
Endosulfan sulfate	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass
Endrin	EPA 8081A	3.8	30	ND	0.02	Pass	ND	0.02	Pass
Endrin Aldehyde	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Endrin ketone	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
gamma-BHC (Lindane)	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Heptachlor	EPA 8081A	1.3	5.6	ND	0.02	Pass	ND	0.02	Pass
Heptachlor epoxide	EPA 8081A	0.2	2.7	ND	0.02	Pass	ND	0.02	Pass
Methoxychlor	EPA 8081A	16	16	ND	0.02	Pass	ND	0.02	Pass

Notes:

DU = Decision Unit

DOH = State of Hawai'i Department of Health

EPA = Environmental Protection Agency

ND = Not detected above the laboratory detection limit

EAL = Environmental Action Level

mg/kg = Milligrams per kilogram

bgs = Below ground surface

Table 1. Soil Screen Sampling Results  
 University of Hawai'i at Hilo Educational Observatory  
 Halepōhaku, Maunakea, Hawai'i

				Sample Location			Footprint of Planned Telescope, Walkway, and Wall (0"-6" bgs)			Footprint of Planned Telescope, Walkway, and Wall (6"-18" bgs)		
				Descriptive Sample ID			DU-1C			DU-2		
Analyte	Laboratory Analytical Method	DOH EAL Unrestricted Land Use (mg/kg)	DOH EAL Commercial/Industrial Land Use (mg/kg)	Result (mg/kg)	Laboratory Reporting Limit (mg/kg)	Pass/Fail	Result (mg/kg)	Laboratory Reporting Limit (mg/kg)	Pass/Fail			
<b>RCRA 8 Metals</b>												
Arsenic (Total)	EPA 3051m/7061Am	24	95	2.2	1	Pass	3	1	Pass			
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	ND	500	Pass	580	500	Pass			
Cadmium (Cd)	EPA 3051m/7000Bm	14	120	ND	9.9	Pass	ND	9.9	Pass			
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	ND	79	Pass	ND	79	Pass			
Lead (Pb)	EPA 3051m/7000Bm	200	800	43	40	Pass	81	40	Pass			
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	Pass	ND	2	Pass			
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	20	Pass	ND	20	Pass			
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	4	Pass	ND	4	Pass			
<b>Organochlorine Pesticides</b>												
4,4'-DDD	EPA 8081A	2.2	8.4	ND	0.02	Pass	ND	0.02	Pass			
4,4'-DDE	EPA 8081A	1.9	8.2	ND	0.02	Pass	ND	0.02	Pass			
4,4'-DDT	EPA 8081A	1.8	5.6	ND	0.02	Pass	ND	0.02	Pass			
Aldrin	EPA 8081A	3.9	8.4	ND	0.02	Pass	ND	0.02	Pass			
alpha-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass			
beta-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass			
Chlordane (Technical)	EPA 8081A	17	23	ND	0.2	Pass	ND	0.2	Pass			
delta-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass			
Dieldrin	EPA 8081A	2.5	24	ND	0.02	Pass	ND	0.02	Pass			
Endosulfan I	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass			
Endosulfan II	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass			
Endosulfan sulfate	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass			
Endrin	EPA 8081A	3.8	30	ND	0.02	Pass	ND	0.02	Pass			
Endrin Aldehyde	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass			
Endrin ketone	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass			
gamma-BHC (Lindane)	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass			
Heptachlor	EPA 8081A	1.3	5.6	ND	0.02	Pass	ND	0.02	Pass			
Heptachlor epoxide	EPA 8081A	0.2	2.7	ND	0.02	Pass	ND	0.02	Pass			
Methoxychlor	EPA 8081A	16	16	ND	0.02	Pass	ND	0.02	Pass			

Notes:

DU = Decision Unit

DOH = State of Hawai'i Department of Health

EPA = Environmental Protection Agency

ND = Not detected above the laboratory detection limit

EAL = Environmental Action Level

mg/kg = Milligrams per kilogram

bgs = Below ground surface

Table 1. Soil Screen Sampling Results  
 University of Hawai'i at Hilo Educational Observatory  
 Halepōhaku, Maunakea, Hawai'i

				Sample Location			Footprint of Planned Gate Areas		
				Descriptive Sample ID			Footprint of Planned Gate Areas		
				DU-3			DU-4		
Analyte	Laboratory Analytical Method	DOH EAL Unrestricted Land Use (mg/kg)	DOH EAL Commercial/Industrial Land Use (mg/kg)	Result (mg/kg)	Laboratory Reporting Limit (mg/kg)	Pass/Fail	Result (mg/kg)	Laboratory Reporting Limit (mg/kg)	Pass/Fail
<b>RCRA 8 Metals</b>									
Arsenic (Total)	EPA 3051m/7061Am	24	95	ND	1	Pass	ND	1	Pass
Barium (Ba)	EPA 3051m/7000Bm	1000	2500	ND	500	Pass	ND	500	Pass
Cadmium (Cd)	EPA 3051m/7000Bm	14	120	ND	9.9	Pass	ND	9.9	Pass
Chromium (Cr)	EPA 3051m/7000Bm	1100	1100	ND	79	Pass	ND	79	Pass
Lead (Pb)	EPA 3051m/7000Bm	200	800	ND	40	Pass	ND	40	Pass
Selenium (Se)	EPA 6020B/3050B	78	1000	ND	2	Pass	ND	2	Pass
Silver (Ag)	EPA 3051m/7000Bm	78	1000	ND	20	Pass	ND	20	Pass
Mercury (Hg)	EPA 3051m/7471Bm	4.7	61	ND	4	Pass	ND	4	Pass
<b>Organochlorine Pesticides</b>									
4,4'-DDD	EPA 8081A	2.2	8.4	ND	0.02	Pass	ND	0.02	Pass
4,4'-DDE	EPA 8081A	1.9	8.2	ND	0.02	Pass	ND	0.02	Pass
4,4'-DDT	EPA 8081A	1.8	5.6	ND	0.02	Pass	ND	0.02	Pass
Aldrin	EPA 8081A	3.9	8.4	ND	0.02	Pass	ND	0.02	Pass
alpha-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
beta-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Chlordane (Technical)	EPA 8081A	17	23	ND	0.2	Pass	ND	0.2	Pass
delta-BHC	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Dieldrin	EPA 8081A	2.5	24	ND	0.02	Pass	ND	0.02	Pass
Endosulfan I	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass
Endosulfan II	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass
Endosulfan sulfate	EPA 8081A	13	13	ND	0.02	Pass	ND	0.02	Pass
Endrin	EPA 8081A	3.8	30	ND	0.02	Pass	ND	0.02	Pass
Endrin Aldehyde	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Endrin ketone	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
gamma-BHC (Lindane)	EPA 8081A	N/A	N/A	ND	0.02	Pass	ND	0.02	Pass
Heptachlor	EPA 8081A	1.3	5.6	ND	0.02	Pass	ND	0.02	Pass
Heptachlor epoxide	EPA 8081A	0.2	2.7	ND	0.02	Pass	ND	0.02	Pass
Methoxychlor	EPA 8081A	16	16	ND	0.02	Pass	ND	0.02	Pass

Notes:

DU = Decision Unit

DOH = State of Hawai'i Department of Health

EPA = Environmental Protection Agency

ND = Not detected above the laboratory detection limit

EAL = Environmental Action Level

mg/kg = Milligrams per kilogram

bgs = Below ground surface

## Appendix **II**

### **FIGURE 1: DECISION UNIT BOUNDARY MAP**

Figure 1. Decision Unit (DU) Locations and Site Layout  
University of Hawai'i at Hilo New Educational Telescope Project



*Appendix* **III**

**PHOTOGRAPH LOG 1: TARGETED SOIL SCREEN SURVEY**

**Photograph Log 1. Targeted Soil Screen Survey  
University of Hawai'i at Hilo  
New Educational Telescope Project  
Halepōhaku, Maunakea, Hawai'i**



**Photo 1: View of Proposed Site for New Educational Telescope**

View facing west of DU-1, DU-1B, DU-1C, and DU-2; the proposed site for the educational telescope, walkway, and wall.



**Photo 2: View of Proposed Site for Upper Gate**

View facing south-east of DU-3 and DU-4; the proposed site for the upper gate.

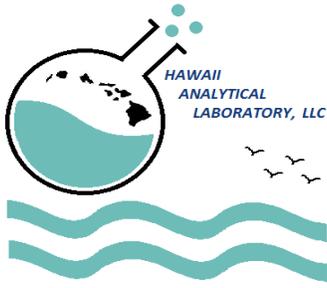


**Photo 3: View of Proposed Site for Lower Gate**

View facing south of DU-3 and DU-4; the proposed site for the lower gate.

# Appendix **IV**

## SOIL LABORATORY ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY FORMS



# Hawaii Analytical Laboratory ANALYTICAL REPORT

Friday, September 18, 2020

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

## Chlordane (Technical Grade) #

EPA Method: 8081A -m [Gas Chromatography - ECD]

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	< 1	mg/kg	9/16/2020
Comments: Multi-incremental sampling was performed on the sample.				
202046842	DU-1B	< 1	mg/kg	9/16/2020
Comments: Multi-incremental sampling was performed on the sample.				
202046843	DU-1C	< 1	mg/kg	9/16/2020
Comments: Multi-incremental sampling was performed on the sample.				
202046844	DU-2	< 1	mg/kg	9/16/2020
Comments: Multi-incremental sampling was performed on the sample.				
202046845	DU-3	< 1	mg/kg	9/16/2020
Comments: Multi-incremental sampling was performed on the sample.				
202046846	DU-4	< 1	mg/kg	9/16/2020
Comments: Multi-incremental sampling was performed on the sample.				

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
 Lehua Environmental Inc.  
 P.O. Box 1018  
 Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

## Organochlorinated Pesticides #

EPA Method: 8081A -m [Gas Chromatography - ECD]

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
<b>202046841</b>	<b>DU-1</b>			9/16/2020
Comments	4,4'-DDD	< 0.02 mg/kg		
	4,4'-DDE	< 0.02 mg/kg		
	4,4'-DDT	< 0.02 mg/kg		
	Aldrin	< 0.02 mg/kg		
	alpha-BHC	< 0.02 mg/kg		
	beta-BHC	< 0.02 mg/kg		
	delta-BHC	< 0.02 mg/kg		
	Dieldrin	< 0.02 mg/kg		
	Endosulfan I	< 0.02 mg/kg		
	Endosulfan II	< 0.02 mg/kg		
	Endosulfan Sulfate	< 0.02 mg/kg		
	Endrin	< 0.02 mg/kg		
	Endrin Aldehyde	< 0.02 mg/kg		
	Endrin Ketone	< 0.02 mg/kg		
	gamma-BHC	< 0.02 mg/kg		
	Heptachlor	< 0.02 mg/kg		
	Heptachlor Epoxide	< 0.02 mg/kg		
	Methoxychlor	< 0.02 mg/kg		

Multi-incremental sampling was performed on the sample.

<b>202046842</b>	<b>DU-1B</b>			9/16/2020
Comments	4,4'-DDD	< 0.02 mg/kg		
	4,4'-DDE	< 0.02 mg/kg		
	4,4'-DDT	< 0.02 mg/kg		
	Aldrin	< 0.02 mg/kg		
	alpha-BHC	< 0.02 mg/kg		
	beta-BHC	< 0.02 mg/kg		
	delta-BHC	< 0.02 mg/kg		
	Dieldrin	< 0.02 mg/kg		
	Endosulfan I	< 0.02 mg/kg		
	Endosulfan II	< 0.02 mg/kg		
	Endosulfan Sulfate	< 0.02 mg/kg		
	Endrin	< 0.02 mg/kg		
	Endrin Aldehyde	< 0.02 mg/kg		
	Endrin Ketone	< 0.02 mg/kg		
	gamma-BHC	< 0.02 mg/kg		
	Heptachlor	< 0.02 mg/kg		
	Heptachlor Epoxide	< 0.02 mg/kg		
	Methoxychlor	< 0.02 mg/kg		

Multi-incremental sampling was performed on the sample.

**Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015**

Mr. Kama Kobayashi  
 Lehua Environmental Inc.  
 P.O. Box 1018  
 Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

## Organochlorinated Pesticides #

EPA Method: 8081A -m [Gas Chromatography - ECD]

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
<b>202046843</b>	<b>DU-1C</b>			9/16/2020
Comments	4,4'-DDD	< 0.02 mg/kg		
	4,4'-DDE	< 0.02 mg/kg		
	4,4'-DDT	< 0.02 mg/kg		
	Aldrin	< 0.02 mg/kg		
	alpha-BHC	< 0.02 mg/kg		
	beta-BHC	< 0.02 mg/kg		
	delta-BHC	< 0.02 mg/kg		
	Dieldrin	< 0.02 mg/kg		
	Endosulfan I	< 0.02 mg/kg		
	Endosulfan II	< 0.02 mg/kg		
	Endosulfan Sulfate	< 0.02 mg/kg		
	Endrin	< 0.02 mg/kg		
	Endrin Aldehyde	< 0.02 mg/kg		
	Endrin Ketone	< 0.02 mg/kg		
	gamma-BHC	< 0.02 mg/kg		
	Heptachlor	< 0.02 mg/kg		
	Heptachlor Epoxide	< 0.02 mg/kg		
	Methoxychlor	< 0.02 mg/kg		

Multi-incremental sampling was performed on the sample.

<b>202046844</b>	<b>DU-2</b>			9/16/2020
Comments	4,4'-DDD	< 0.02 mg/kg		
	4,4'-DDE	< 0.02 mg/kg		
	4,4'-DDT	< 0.02 mg/kg		
	Aldrin	< 0.02 mg/kg		
	alpha-BHC	< 0.02 mg/kg		
	beta-BHC	< 0.02 mg/kg		
	delta-BHC	< 0.02 mg/kg		
	Dieldrin	< 0.02 mg/kg		
	Endosulfan I	< 0.02 mg/kg		
	Endosulfan II	< 0.02 mg/kg		
	Endosulfan Sulfate	< 0.02 mg/kg		
	Endrin	< 0.02 mg/kg		
	Endrin Aldehyde	< 0.02 mg/kg		
	Endrin Ketone	< 0.02 mg/kg		
	gamma-BHC	< 0.02 mg/kg		
	Heptachlor	< 0.02 mg/kg		
	Heptachlor Epoxide	< 0.02 mg/kg		
	Methoxychlor	< 0.02 mg/kg		

Multi-incremental sampling was performed on the sample.

**Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015**

Mr. Kama Kobayashi  
 Lehua Environmental Inc.  
 P.O. Box 1018  
 Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

## Organochlorinated Pesticides #

EPA Method: 8081A -m [Gas Chromatography - ECD]

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
<b>202046845</b>	<b>DU-3</b>			9/16/2020
Comments	4,4'-DDD	< 0.02 mg/kg		
	4,4'-DDE	< 0.02 mg/kg		
	4,4'-DDT	< 0.02 mg/kg		
	Aldrin	< 0.02 mg/kg		
	alpha-BHC	< 0.02 mg/kg		
	beta-BHC	< 0.02 mg/kg		
	delta-BHC	< 0.02 mg/kg		
	Dieldrin	< 0.02 mg/kg		
	Endosulfan I	< 0.02 mg/kg		
	Endosulfan II	< 0.02 mg/kg		
	Endosulfan Sulfate	< 0.02 mg/kg		
	Endrin	< 0.02 mg/kg		
	Endrin Aldehyde	< 0.02 mg/kg		
	Endrin Ketone	< 0.02 mg/kg		
	gamma-BHC	< 0.02 mg/kg		
	Heptachlor	< 0.02 mg/kg		
	Heptachlor Epoxide	< 0.02 mg/kg		
	Methoxychlor	< 0.02 mg/kg		

Multi-incremental sampling was performed on the sample.

<b>202046846</b>	<b>DU-4</b>			9/16/2020
Comments	4,4'-DDD	< 0.02 mg/kg		
	4,4'-DDE	< 0.02 mg/kg		
	4,4'-DDT	< 0.02 mg/kg		
	Aldrin	< 0.02 mg/kg		
	alpha-BHC	< 0.02 mg/kg		
	beta-BHC	< 0.02 mg/kg		
	delta-BHC	< 0.02 mg/kg		
	Dieldrin	< 0.02 mg/kg		
	Endosulfan I	< 0.02 mg/kg		
	Endosulfan II	< 0.02 mg/kg		
	Endosulfan Sulfate	< 0.02 mg/kg		
	Endrin	< 0.02 mg/kg		
	Endrin Aldehyde	< 0.02 mg/kg		
	Endrin Ketone	< 0.02 mg/kg		
	gamma-BHC	< 0.02 mg/kg		
	Heptachlor	< 0.02 mg/kg		
	Heptachlor Epoxide	< 0.02 mg/kg		
	Methoxychlor	< 0.02 mg/kg		

Multi-incremental sampling was performed on the sample.

**Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015**

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

### Total Lead (soil)

EPA Method: 3051m / 7000Bm

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	43	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046842	DU-1B	66	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046843	DU-1C	43	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046844	DU-2	81	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046845	DU-3	< 40	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046846	DU-4	< 40	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

### Total Recoverable Arsenic (Gaseous Hydride) #

EPA Method: 3051m / 7061Am

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	2.8	mg/kg	9/14/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046842	DU-1B	2.8	mg/kg	9/14/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046843	DU-1C	2.2	mg/kg	9/14/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046844	DU-2	3	mg/kg	9/14/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046845	DU-3	< 0.99	mg/kg	9/14/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046846	DU-4	< 1	mg/kg	9/14/2020
Comments	Multi-incremental sampling was performed on the sample.			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

### Total Recoverable Barium #

EPA Method: 3051m / 7000Bm

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	< 500	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046842	DU-1B	< 500	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046843	DU-1C	< 500	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046844	DU-2	580	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046845	DU-3	< 500	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046846	DU-4	< 500	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

### Total Recoverable Cadmium #

EPA Method: 3051m / 7000Bm

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	< 10	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046842	DU-1B	< 10	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046843	DU-1C	< 10	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046844	DU-2	< 10	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046845	DU-3	< 10	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046846	DU-4	< 10	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

### Total Recoverable Chromium #

EPA Method: 3051m / 7000Bm

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	< 79	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046842	DU-1B	< 80	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046843	DU-1C	< 80	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046844	DU-2	< 79	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046845	DU-3	< 80	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046846	DU-4	< 80	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

### Total Recoverable Mercury (Manual Cold-Vapor Technique) #

EPA Method: 3051m / 7471Bm

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	< 4	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046842	DU-1B	< 4	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046843	DU-1C	< 4	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046844	DU-2	< 4	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046845	DU-3	< 4	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046846	DU-4	< 4	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

### Total Recoverable Silver #

EPA Method: 3051m / 7000Bm

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202046841	DU-1	< 20	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046842	DU-1B	< 20	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046843	DU-1C	< 20	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046844	DU-2	< 20	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046845	DU-3	< 20	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			
202046846	DU-4	< 20	mg/kg	9/18/2020
Comments	Multi-incremental sampling was performed on the sample.			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

Mr. Kama Kobayashi  
Lehua Environmental Inc.  
P.O. Box 1018  
Kamuela HI 96743

**Phone Number:** (808) 494-0365  
**Facsimile:**  
**Email:** lehuaenvironmental@gmail.com

**Lab Job No:** 202007749  
**Date Submitted:** 9/11/2020  
**Your Project:** Mauna Kea, Hale Pohaku Educational Telescope, 9/9/20

---

**All Quality Control data are acceptable unless otherwise noted.**  
**MRL for lead air is 5ug.**  
**MRL for lead wipe is 10ug.**  
**MRL for lead paint or soil is 40 mg/kg for a 0.25g sample.**

**General Comments**

The sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures associated with the "analytical method" referenced above. Modifications to this methodology may have been made based upon the analyst's professional judgment and / or sample matrix effects encountered. The analysis of sample relates only to the sample analyzed, and may or may not be representative of the original source of the material submitted for our analysis. All analysts participate in interlaboratory quality control testing to continuously document proficiency. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report should not be construed as an endorsement for a product or a service by the AIHA LAP, LLC or any affiliated organizations. Sample and associated sampling / collection data is reported as provided by client. TWA values have been calculated based on information supplied by the client that the laboratory has not independently verified. Results have not been corrected for blank determinations unless noted in remarks. Unless otherwise indicated the sample condition at the time of receipt was acceptable.

**Results and Symbols Definitions**

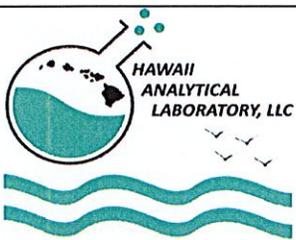
> This testing result is greater than the numerical value listed.  
< This testing result is less than the numerical value listed.  
# = Analytical methods marked with an "#" are not within our AIHA LAP, LLC Scope of Accreditation.  
MRL = Method Reporting Limit.



---

**Jennifer Hsu Liao**  
**Laboratory Manager**

**Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on [www.aihaaccreditedlabs.org](http://www.aihaaccreditedlabs.org), in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015**



3615 Harding Avenue, Suite 308  
 Honolulu, HI 96816  
 Ph: 808-735-0422 - Fax: 808-735-0047  
 www.analyzehawaii.com

New Client?

Report To* : Kama Kobayashi  
 Company : Lehua Environmental Inc.  
 Address* : PO BOX 1018  
 : Kamuela, Hawaii 96743  
 Phone / Cell No.* : 808-494-0365  
 Report results to : K. Kobayashi  
 via email or fax : [JKline.geo@gmail.com](mailto:JKline.geo@gmail.com),  
[lehuaenvironmental@gmail.com](mailto:lehuaenvironmental@gmail.com)

Invoice To* : Kamalana Kobayashi  
 Company : Lehua Environmental Inc.  
 Address* : PO BOX 1018  
 : Kamuela, Hawaii 96743  
 Phone / Cell No.* :  
 Purchase Order No. :  
 Email Invoice To : [lehuaenvironmental@gmail.com](mailto:lehuaenvironmental@gmail.com)

**Need Results By*:**

- 5 Working Days (WD)
- 4 WD
- 3 WD
- 2 WD
- 24 hours
- 6 hours or less
- 4 hours or less
- 1-2 hours

Site/Project Name: **Mauna Kea, Hale Pohaku Educational Telescope** Client Project No.: **9.11.20** Sampled By: **Jason Kline**

Comments / Special Instructions: ***Temp. 7.2°C - upon receipt. AA**  
 MIS Lab Prep, RCRA 8 metals (As on 24 hr TAT, if As>23mg/kg then Bioaccessible As on 5 day TAT), Organochlorine Pesticides w Technical Chlordane  
 PLM POSITIVE STOP Instructions:  
 Positive stop per SAMPLE  
 Positive stop per LAYER  
**LAB USE ONLY**  
**202007749**

Sample Identification / Description* (Maximum of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
1 DU-1	9/9/2020	Soil		See Comments		202046841
2 DU-1B	9/9/2020	Soil		See Comments		202046842
3 DU-1C	9/9/2020	Soil		See Comments		202046843
4 DU-2	9/9/2020	Soil		See Comments		202046844
5 DU-3	9/9/2020	Soil		See Comments		202046845
6 DU-4	9/9/2020	Soil		See Comments		202046846
Relinquished By (Print and Sign)		Date/Time		Received By (Print and Sign)		Date/Time
Jason Kline		9/10/2020 12:00		Anne Antin <i>Anne Antin</i>		09-11-20 09:40 IN

*Sample description can be paint chips, concrete, specific sample collection location, etc...

- via HAC  via USPS  via drop box  via FedEx  via pick up

If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.

All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.

awb#: 173-07419510

*Required fields, failure to complete these fields may result in a delay in your samples being processed.



12524 130th Lane NE  
Kirkland WA 98034

Tel: (425) 214-5858  
(425) 214-5868  
Email: lisa@accu-lab.com  
website: www.accu-lab.com

### Analytical Report

<b>Client</b>	<b>Advanced Analytical Laboratory</b> 544 Ohohia Street #10 Honolulu, HI, 96819	<b>Acculab WO#</b>	<b>20-AL0915-4</b>
<b>Project Manager</b>	Uwe Baumgartner/ Elisa Young	Date Sampled	9/9/2020
<b>Project Name</b>	<b>Hale Pohaku Educational telescope</b>	Date Received	9/15/2020
<b>Client Project#</b>	<b>202007749</b>	Date Reported	9/18/2020
<b>Project#</b>	<b>V764</b>		

### Metals in Soil by EPA 6020B/EPA3050B

Accu Lab Batch# AL091820-11

Client sample ID					DU-1A	DU-1B	DU-1C	DU-2
Lab ID	<b>MRL</b>	<b>Unit</b>	<b>MTH BLK</b>	<b>LCS</b>	20-AL0915-4-1	20-AL0915-4-2	20-AL0915-4-3	20-AL0915-4-4
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Date Digested			9/18/2020	9/18/2020	9/18/2020	9/18/2020	9/18/2020	9/18/2020
Date Analyzed			9/18/2020	9/18/2020	9/18/2020	9/18/2020	9/18/2020	9/18/2020
Selenium (Se)	2.0	mg/kg	nd	108%	nd	nd	nd	nd

*Acceptable Recovery Limits:*

LCS	80-120%
MS/MSD	75-125%
Acceptable RPD limit:	20%



12524 130th Lane NE  
Kirkland WA 98034

Tel: (425) 214-5858  
(425) 214-5868  
Email: lisa@accu-lab.com  
website: www.accu-lab.com

### Analytical Report

<b>Client</b>	<b>Advanced Analytical Laboratory</b> 544 Ohohia Street #10 Honolulu, HI, 96819	<b>Acculab WO#</b>	<b>20-AL0915-4</b>
<b>Project Manager</b>	Uwe Baumgartner/ Elisa Young	<b>Date Sampled</b>	9/9/2020
<b>Project Name</b>	<b>Hale Pohaku Educational telescope</b>	<b>Date Received</b>	9/15/2020
<b>Client Project#</b>	<b>202007749</b>	<b>Date Reported</b>	9/18/2020
<b>Project#</b>	<b>V764</b>		

### Metals in Soil by EPA 6020B/EPA3050B

Accu Lab Batch# AL091820-11

Client sample ID			DU-3	DU-4	MS	MSD	RPD
Lab ID	<b>MRL</b>	<b>Unit</b>	20-AL0915-4-5	20-AL0915-4-6	20-AL0915-3-1	20-AL0915-3-1	20-AL0915-3-1
Matrix			Soil	Soil	Soil	Soil	Soil
Date Digested			9/18/2020	9/18/2020	9/18/2020	9/18/2020	9/18/2020
Date Analyzed			9/18/2020	9/18/2020	9/18/2020	9/18/2020	9/18/2020
Selenium (Se)	2.0	mg/kg	nd	nd	91%	90%	1%

*Acceptable Recovery Limits:*

LCS	80-120%
MS/MSD	75-125%
Acceptable RPD limit:	20%

**Analytical Report**

<b>Client</b>	<b>Advanced Analytical Laboratory</b> 544 Ohohia Street #10 Honolulu, HI, 96819	<b>Acculab WO#</b>	<b>20-AL0915-4</b>
<b>Project Manager</b>	Uwe Baumgartner/ Elisa Young	Date Sampled	9/9/2020
<b>Project Name</b>	<b>Hale Pohaku Educational telescope</b>	Date Received	9/15/2020
<b>Client Project#</b>	<b>202007749</b>	Date Reported	9/18/2020
<b>Project#</b>	<b>V764</b>		

**Data Qualifiers and Comments:**

**Results reported on dry-weight basis for soil samples.**

- MRL-** Method Reporting Limit
- nd-** Indicates the analyte is not detected at the listing reporting limit.
- C-** Coelution with other compounds.
- M-** % Recovery of surrogate, MS/MSD is out of the acceptable limit due to matrix effect.
- B-** Indicates the analyte is detected in the method blank associated with the sample.
- J-** The analyte is detected at below the reporting limit.
- E-** The result reported exceeds the calibration range, and is an estimate.
- D-** Sample required dilution due to matrix. Method Reporting Limits were elevated due to dilutions.
- H-** Sample was received or analyzed past holding time
- Q-** Sample was received with head space, improper preserved or above recommended temperature.
- I-** Due to insufficient sample, LCS/LCS DUP were analyzed in place of MS/MSD.
- R-** The recovery of this analyte in QC sample failed high, but the analyte was not detected in all related samples. No action was taken.
- R-1-** The RPD value for the MS/MSD was outside of QC acceptance limits however both recoveries were acceptable. All related samples were "nd". No action was taken.
- R-2-** The recovery of the surrogate in sample failed high, but all related analytes were not detected in the sample. No action was taken.

# ADVANCED ANALYTICAL LABORATORY-CHAIN OF CUSTODY RECORD

Phone: (808) 836 2252

Fax: (808) 836 2250

Address: 3210 Koapaka Street#A Honolulu, HI 96819

TURNAROUND TIME: 3 Day TAT

AAL PROJECT#: _____

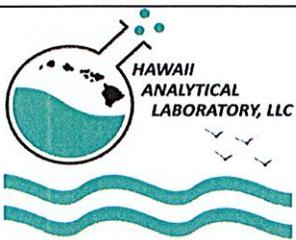
V764

20-AL0915-4

CLIENT: <u>Hawaii Analytical Laboratory</u>	PROJECT NAME: <u>Mauna Kea, Hale Pohaku Educational Telescope</u>
ADDRESS: <u>3615 Harding Ave, Suite 308 - Honolulu HI, 96816</u>	COLLECTOR: <u>Jason Kline</u>
PHONE / EMAIL : <u>808-735-0422 jhsu@analyzehawaii.com &amp; aantin@analyzehawaii.com</u>	DATE OF COLLECTION: <u>09/09/20</u>
CLIENT PROJECT#: <u>202007749</u>	PROJECT MANAGER: <u>Anne Antin</u>

Sample Number	Sample Type	Container Type	ANALYSES										Number of containers	Number containers received					
DU-1	Soil	1 ziploc									X						MIS 30 incr.	1	
DU-1B	Soil	1 ziploc									X						MIS 30 incr.	1	
DU-1C	Soil	1 ziploc									X						MIS 30 incr.	1	
DU-2	Soil	1 ziploc									X						MIS 30 incr.	1	
DU-3	Soil	1 ziploc									X						MIS 30 incr.	1	
DU-4	Soil	1 ziploc									X						MIS 30 incr.	1	

RELINQUISHED BY (Signature) <u>Anne Antin</u>	DATE/TIME <u>9/14/2020</u>	RECEIVED BY (Signature) <u>[Signature]</u>	DATE/TIME <u>9-15-20</u>	<b>SAMPLE RECEIPT</b>	LABORATORY NOTES:
				TOTAL NUMBER OF CONTAINERS <u>6</u>	Big Island soil samples. MIS was already performed. Please provide QAQC data.
				CHAIN OF CUSTODY SEALS INTACT <u>✓</u>	
				RECEIVED IN GOOD CONDITION <u>✓</u>	
				TEMPERATURE _____	
				Page 1 of 1	



3615 Harding Avenue, Suite 308  
 Honolulu, HI 96816  
 Ph: 808-735-0422 - Fax: 808-735-0047  
 www.analyzehawaii.com

New Client?

Report To* : Kama Kobayashi  
 Company : Lehua Environmental Inc.  
 Address* : PO BOX 1018  
 : Kamuela, Hawaii 96743  
 Phone / Cell No.* : 808-494-0365  
 Report results to : K. Kobayashi  
 via email or fax : [JKline.geo@gmail.com](mailto:JKline.geo@gmail.com),  
[lehuaenvironmental@gmail.com](mailto:lehuaenvironmental@gmail.com)

Invoice To* : Kamalana Kobayashi  
 Company : Lehua Environmental Inc.  
 Address* : PO BOX 1018  
 : Kamuela, Hawaii 96743  
 Phone / Cell No.* :  
 Purchase Order No. :  
 Email Invoice To : [lehuaenvironmental@gmail.com](mailto:lehuaenvironmental@gmail.com)

**Need Results By*:**

- 5 Working Days (WD)
- 4 WD
- 3 WD
- 2 WD
- 24 hours
- 6 hours or less
- 4 hours or less
- 1-2 hours

Site/Project Name: Mauna Kea, Hale Pohaku Educational Telescope Client Project No.: 9.11.20 Sampled By: Jason Kline

Comments / Special Instructions: *Temp. 7.2°C - upon receipt. AA  
 MIS Lab Prep, RCRA 8 metals (As on 24 hr TAT, if As>23mg/kg then Bioaccessible As on 5 day TAT), Organochlorine Pesticides w Technical Chlordane

PLM POSITIVE STOP Instructions:  
 Positive stop per SAMPLE  
 Positive stop per LAYER

**LAB USE ONLY**  
 202007749

Sample Identification / Description* (Maximum of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
1 DU-1	9/9/2020	Soil		See Comments		202046841
2 DU-1B	9/9/2020	Soil		See Comments		202046842
3 DU-1C	9/9/2020	Soil		See Comments		202046843
4 DU-2	9/9/2020	Soil		See Comments		202046844
5 DU-3	9/9/2020	Soil		See Comments		202046845
6 DU-4	9/9/2020	Soil		See Comments		202046846
Relinquished By (Print and Sign)		Date/Time		Received By (Print and Sign)		Date/Time
Jason Kline		9/10/2020 12:00		Anne Antin Anne Antin		09-11-20 09:40 IN

*Sample description can be paint chips, concrete, specific sample collection location, etc...

- via HAC  via USPS  via drop box  via FedEx  via pick up

If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.

All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.

awb#: 173-07419510

*Required fields, failure to complete these fields may result in a delay in your samples being processed.

# Appendix E

---

## Pre-Assessment Consultation Comments and Responses

*This page intentionally left blank.*

**Jennifer Scheffel**

---

**From:** Vivian Chang <vividchange@mac.com>  
**Sent:** Sunday, February 14, 2021 6:12 AM  
**To:** Jennifer Scheffel  
**Subject:** UH Hilo New Educational Telescope Facility

Email received from EXTERNAL sender. Confirm the content is safe prior to opening attachments or links.

Aloha Ms. Scheffel,

I appreciate the opportunity to encourage the construction of the UH Hilo New Educational Telescope Facility. This is a wonderful opportunity for the people of Hawaii, to advance human knowledge about the universe, and for the people of the world, to benefit from the rare combination of geography, geology and history that make our islands the best place in the world for such a project.

The original navigators who located our tiny islands in the middle of the vast blue Pacific Ocean used an incredible combination of observation, historical memory, skill, aptitude, technology, and courage. We can and should continue that tradition, with exploration into the vast universe. The observations of the stars and the sky enabled the ancestors to locate Hawaii in the world, and now further observations will continue to help Hawaii and the world locate ourselves in the universe.

We live on the tallest mountain in the world, measured from the sea floor. Our atmosphere is among the clearest in the world. Our people, using the latest astronomical technology, can continue the tradition of exploration.

This is a better use of our minds, hearts and resources than a casino, which only preys on the foolishness and weakness of materialistic culture, and sows greed, preys on ignorance, and invites criminal behavior. This project will be an investment, not a cancer, and will truly help the people of Hawaii, and benefit the rest of the world.

I once visited Halepohaku, "House of Stone" to acclimate to the rarified atmosphere of the mountain. I noticed the colorful but obsolete Apple Emacs in the visitor facilities. Let us bring the latest tools to the people who are exploring the vast unknown universe.

By the way, I'm not meant to be climbing the Himalayas, and got dopey and confused on the way up, and had to be stopped from staggering on, by a helpful ranger...

I cannot go to the top, but I will do everything I can to help others have access to the mountain, to study the sky.

Mahalo,

Vivian Chang  
3093 Pualei Circle #205  
Honolulu, HI 96815  
808 265-6215  
vividchange@mac.com



August 29, 2022

SSFM 2020_037.000

Ms. Vivian Chang  
EMAIL: [vividchange@mac.com](mailto:vividchange@mac.com)

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Ms. Chang,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). The University of Hawaii at Hilo (UH Hilo) appreciates your support for the proposed New Educational Telescope project.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner



## The Senate

STATE CAPITOL  
HONOLULU, HAWAII 96813

To: Jennifer M. Scheffel, Sr. Environmental Planner, SSFM International

From: Senator Lorraine Inouye

Date: March 2, 2021

Subject: Comments on the Construction of New Educational Telescope Facility  
On Mauna Kea, Hamakua District, Island of Hawaii  
For Draft Environmental Assessment

I am writing this statement in **support** of the construction of a new educational telescope facility on Mauna Kea, Island of Hawaii for the University of Hawaii at Hilo. The 28-inch telescope will be built on a parcel at the Hale Pohaku area below the summit at the 9,200 foot level (TMK): (3)-4-4-015:012.

Access to a state of the art, educational telescope will benefit University of Hawaii students and faculty who pursue the study of astronomy. It may also benefit the community since the telescope will be at a lower elevation. Students and other astronomers could use it as an informational tool to educate the public.

This telescope will be housed in a small, domed structure measuring 14 feet tall and 18 feet wide. The area is presently used for storage. I don't see any adverse environmental impact to the area that is already developed with several structures that support the astronomy community.

I believe the telescope will be a great supplemental instrument to have on the island as we groom our future astronomers for careers that can keep them in Hawaii. Astronomy is a good, clean, knowledge based industry that contributes to our economy and continues to astonish mankind's knowledge of our universe.

The University of Hawaii should be allowed to build it.

Sincerely,

Senator Lorraine Inouye  
Senator, 4th District of the State of Hawaii



August 29, 2022

SSFM 2020_037.000

Senator Lorraine Inouye  
4th District of the State of Hawaii'i  
Hawaii'i State Capitol  
Room 210  
Honolulu, HI 96813

**SUBJECT: University of Hawaii'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawaii'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Senator Inouye,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). The University of Hawaii at Hilo (UH Hilo) appreciates your support for the proposed New Educational Telescope project.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

**Jennifer Scheffel**

**From:** Jim Anthony <drjmanthony77@gmail.com>  
**Sent:** Thursday, March 4, 2021 11:03 PM  
**To:** Jennifer Scheffel  
**Subject:** Re: University of Hawaii at Hilo, New Educational Telescope

Email received from EXTERNAL sender. Confirm the content is safe prior to opening attachments or links.

Ms. Scheffel

Your emailed letter of March 4 is acknowledged. The last page of your letter invites me to comment on the proposed new telescope and invites me also to ask questions.

Abbreviated preliminary comments interspersed with some questions are as follows:

1. A mere 30 days is not enough time for members of the public like me to comment on a proposal of this magnitude. I seek an additional 60 days to deal effectively with just what your eMail note sets out.
  2. The tone of your letter does not sit well with me.
  3. There is no profile disclosure statement on who or what 'SSFM International, Inc'. is. I think every member of the public contacted by you is entitled to know (for a variety of reasons including professional courtesy) as to who the members of the Board of Directors of SSFM International, Inc. are. Their full titles and a brief annotation that tells us something significant about each member of the Board, including, especially, level of formal higher education (if any) and institutions from which each member of the Board has earned his or her professional credentials. I request a gender breakdown of members of the Board: how many women, how many men? Please disclose how many people of color (by gender breakdown) are members of the Board and when each present 'colored' member of the Board was appointed. Also, please disclose, the process used to appoint members of the Board. Specifically, amongst the current members of the Board of Directors of SSFM International, Inc. how many, if any, are Pacific Islanders including anyone from Hawaii or from any island from within Polynesia, Melanesia or Micronesia.
- Your official designation, below the signature line of your letter says "Sr. Environmental Planner". Please disclose what professional qualifications you have earned and from what institution/s, and when such qualifications were earned. If you have ever published anything that has been peer reviewed, please list all such publications in standard bibliographical format. Please provide me with a short statement disclosing any environmental planning experience that you have had on/in any island anywhere? Do you speak, read or write any first language of any island community in the Pacific? If so, please disclose your level of competence. of any language you identify.
- Has SSFM International, Inc. done any environmental planning work of the kind traversed in your letter in/on any island anywhere? Please provide brief annotated details.

My general comment about your failure to disclose any of the foregoing information raises what I consider to be a huge matter of concern.

The list of questions I have asked are merely illustrative. There are more questions that I have in mind. And, indeed, more comments.

What is the total anticipated cost of this project?

Do you, or your principals (SSFM International. Inc.) have a position on the proposed TMT project on Mauna Kea?

Does SSFM International, Inc. have any kind of connection/relationship with TMT?

Please provide me with as complete a list as possible of the names and professional qualifications of all members of the faculty of UH Hilo who are associated in any way with this proposed project.

Thank you.

J.M. Anthony, PhD  
P.O. Box 1381  
Kaneohe, Hawaii 96744

[drjmanthony77@gmail.com](mailto:drjmanthony77@gmail.com)

On Thu, Mar 4, 2021 at 2:25 PM Jennifer Scheffel <[jscheffel@ssfm.com](mailto:jscheffel@ssfm.com)> wrote:

Aloha Dr. Anthony,

Please see attached letter providing information on the University of Hawaii at Hilo's proposed New Educational Telescope project. Please provide any comments you may have by April 3rd.

Mahalo,

Jennifer Scheffel | Environmental Planner



Innovate | Adapt | Sustain

99 Aupuni Street, Suite 202 | Hilo, Hawaii 96720  
T 808.933.2727 | D 808.356.1273 | F 855.329.7736  
[jscheffel@ssfm.com](mailto:jscheffel@ssfm.com) | [www.ssfm.com](http://www.ssfm.com)

[Gardens for over 1000 special people](#)

NOTICE: This communication and any attachments ("this message") may contain confidential information for the sole use of the intended recipient(s). Any unauthorized use, disclosure, viewing, copying, alteration, dissemination or distribution of, or reliance on this message is strictly prohibited. If you have received this message in error, or you are not an authorized recipient, please notify the sender immediately



August 29, 2022

SSFM 2020_037.000

J.M. Anthony, PhD  
EMAIL: [drjmanthony77@gmail.com](mailto:drjmanthony77@gmail.com)

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Dr. Anthony,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA).

The pre-assessment consultation letter was sent to various agencies and members of the community pursuant to Chapter 11-200.1 of the Hawaii Administrative Rules (HAR) in order to consult with the community prior to the preparation of an EA. The intent of this early consultation is to seek the advice and input of the agencies, citizen groups, and individuals that may be affected (HAR § 11-200.1-18). The University of Hawai'i at Hilo (UH Hilo) identified you as an individual who could provide their perspective on the proposed project.

In addition to the 30-day pre-assessment consultation period, there will be additional opportunities to provide comments throughout the environmental due diligence and permitting process. Once prepared, the Draft EA will be made available for additional public review and comment for 30 days from the date of publication in the Office of Environmental Quality Control's The Environmental Notice. Although not required by law, UH Hilo initiated a public outreach campaign in September and October 2020 at the request of the UH Board of Regents for additional community outreach prior to moving ahead with further plans. This public outreach effort is discussed in Section 6.2 of the Draft EA, and the Community Outreach Report is provided in Appendix F of the Draft EA. UH Hilo also has plans to hold virtual community meetings to receive additional comments coinciding with the 30-day public review period for the Draft EA. Notice of Availability of the Draft EA and notification of the public meetings will be provided to those previously contacted and published in the *Honolulu Star-Advertiser*, *West Hawaii Today*, and the *Hawaii Tribune-Herald*.

As stated in the pre-assessment consultation letter, UH Hilo has contracted SSFM International, Inc. (SSFM) to provide environmental due diligence, planning and permitting, and engineering services for the new educational telescope project. SSFM is a private, locally owned professional multidisciplinary consulting firm providing planning, project management, construction management, civil engineering, structural engineering, traffic engineering, and real estate advisory and development management services. SSFM was founded in 1959 in Honolulu and currently has offices on O'ahu, Maui, Kaua'i, and the Big Island, as well as in Guam, the Philippines, and



July 16, 2021

Okinawa, Japan. The majority of the SSFM team that will be working on the proposed project are part of the Hawaii community who live and work on the Big Island of Hawaii. The company website, <https://www.ssfm.com/>, has more information about the company including biographies of SSFM's management team.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

DAVID Y. IGE  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF BUDGET AND FINANCE  
P.O. BOX 150  
HONOLULU, HAWAII 96810-0150

ADMINISTRATIVE AND RESEARCH OFFICE  
BUDGET, PROGRAM PLANNING AND  
MANAGEMENT DIVISION  
FINANCIAL ADMINISTRATION DIVISION  
OFFICE OF FEDERAL AWARDS MANAGEMENT (OFAM)

CRAIG K. HIRAI  
DIRECTOR  
ROBERT YU  
DEPUTY DIRECTOR

EMPLOYEES' RETIREMENT SYSTEM  
HAWAII EMPLOYER-UNION HEALTH BENEFITS TRUST FUND  
OFFICE OF THE PUBLIC DEFENDER

March 5, 2021

Ms. Jennifer M. Scheffel  
Senior Environmental Planner  
SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, Hawaii 96720

SSFM International, Inc.  
**RECEIVED**  
3.11.2021

Dear Ms. Scheffel:

Your request dated February 8, 2021, requesting written comments on the Pre-Assessment Consultation for Draft Environmental Assessment (EA) for the University of Hawaii at Hilo (UH Hilo), New Educational Telescope Facility, Hawaii, has been reviewed.

I understand that UH Hilo is proposing a new educational telescope facility at Halepohaku on Mauna Kea. As stated in the request, the proposed project requires a Draft EA because the project involves the use of State lands and State funds pursuant to Chapter 11-200, Hawaii Administrative Rules (HAR), and the proposed project site is located in a State Land Use Conservation District pursuant to Chapter 13-31, HAR.

The Department of Budget and Finance notes that legislation currently before the Hawaii State Legislature could impact UH's management of the proposed site. While the project may be eligible for general obligation bond financing when funds are available, future appropriations are subject to legislative approval. At this time, the project as proposed does not impact any existing or planned projects, plans, policies, or programs.

Aloha,

CRAIG K. HIRAI  
Director of Finance



August 29, 2022

SSFM 2020_037.000

Mr. Craig K. Hirai, Director  
State of Hawaii  
Department of Budget and Finance  
P.O. Box 150  
Honolulu, HI 96810-0150

**SUBJECT: University of Hawaii at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawaii  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Hirai,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM and the University of Hawaii at Hilo (UH Hilo) acknowledge that there is legislation currently before the Hawaii State Legislature that could impact the University of Hawaii's management of the proposed site. Thank you for the confirmation that the proposed project does not impact Department of Budget and Finance's existing or planned projects, plans, policies, or programs.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

Mitchell D. Roth  
Mayor

Lee E. Lord  
Managing Director



County of Hawai'i  
DEPARTMENT OF PUBLIC WORKS

Aupuni Center  
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224  
(808) 961-8321 · Fax (808) 961-8630  
public_works@hawaiicounty.gov

Steven Ikaika Rodenhurst, P.E.  
Director

Merrick H. Nishimoto  
Deputy Director

MARCH 8, 2021

SSFM INTERNATIONAL, INC.  
ATTN: JENNIFER SCHEFFEL  
99 AUPUNI STREET, SUITE 202  
HILO, HAWAII 96720  
(via email to [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com))

SUBJECT: UNIVERSITY OF HAWAII' I AT HILO NEW EDUCATIONAL TELESCOPE  
FACILITY  
MAUNAKEA, HAMAKUA DISTRICT, HAWAII'  
TMK: (3)4-4-015:012

We received the subject dated February 8, 2021 and have the following comments:

The subject parcels are in an area designated as Zone D on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Zone D corresponds to unstudied areas where flood hazards are undetermined, but possible.

All development-generated runoff shall be disposed of on site and not directed toward any adjacent properties. A drainage study shall be prepared and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works.

All activities shall comply with the requirements of Hawaii County Code (HCC), Chapter 10, Erosion and Sedimentary Control.

Should there be any questions concerning this matter, please contact Ms. Robyn Matsumoto in our Engineering Division at (808) 961-8924.

  
ALAN K. THOMPSON, Acting Division Chief  
Engineering Division

RM

County of Hawai'i is an Equal Opportunity Provider and Employer.



August 29, 2022

SSFM 2020_037.000

Mr. Alan K. Thompson, Division Chief  
Engineering Division  
County of Hawai'i  
Department of Public Works  
101 Pauahi Street, Suite 7  
Hilo, HI 96720

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Thompson,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM and the University of Hawai'i at Hilo (UH Hilo) acknowledge that the proposed project is located in an area designated as Zone D on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Project design will include consideration of development-generated runoff and a drainage study will be prepared and submitted to the County of Hawai'i Department of Public Works for review and approval. All activities will comply with the requirements of Hawai'i County Code (HCC), Chapter 10, Erosion and Sedimentary Control.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.



Jennifer M. Scheffel  
Sr. Environmental Planner

Mitchell D. Roth  
Mayor

Lee E. Lord  
Managing Director

West Hawai'i Office  
74-5044 Ane Keohokālole Hwy  
Kailua-Kona, Hawai'i 96740  
Phone (808) 323-4770  
Fax (808) 327-3563



**County of Hawai'i**  
PLANNING DEPARTMENT

Zendo Kern  
Director

Jeffrey W. Darrow  
Deputy Director

East Hawai'i Office  
101 Pauahi Street, Suite 3  
Hilo, Hawai'i 96720  
Phone (808) 961-8288  
Fax (808) 961-8742

March 8, 2021

Jennifer M. Scheffel  
Sr. Environmental Planner  
SSFM International, Inc.  
99 Aupuni St, Suite 202  
Hilo, HI 96720

Dear Ms. Scheffel,

**Subject: Pre-Assessment Consultation for Draft Environmental Assessment**  
**Applicant: University of Hawai'i at Hilo**  
**Project: New Educational Telescope Facility Maunakea, Hāmākua District, Island of Hawai'i Tax Map Key**  
**TMK: (3) 4-4- 015:012, County & State of Hawai'i**

We understand the University of Hawai'i is in process of decommissioning Hōkū Ke'a. Between 2016 and 2018, UH Hilo evaluated 16 site alternatives before selecting Halepōhaku for the new educational facility. The selected site within Halepōhaku is currently used for equipment storage. The subject parcel is approximately 20 acres, located in the State Land Use Conservation District along the Mauna Kea Access Road at approximately 9,000 ft. elevation.

UH Hilo intends to install a new educational telescope facility at this site, which includes a telescope, dome enclosure, and a raised platform and walkway. The 28- inch telescope; approximately 14- feet-tall with a diameter of 18- feet and with dome proposed to be installed atop a new platform with a potential walkway connection to an existing building at Halepōhaku. The telescope would be mostly operated remotely from the UH Hilo campus or used in a full robotic mode.

It is submitted the proposed project requires the preparation of an environmental assessment (EA), because (1) the proposed action involves the use of state lands and state funds pursuant to Hawaii Administrative Rules (HAR) § 11-200.1-8, and (2) due to the proposed land use located within the Conservation State Land Use District pursuant to HAR§ 13-5- 31.

While we acknowledge the 'disturbed/previously graded' nature of the proposed action, continued use(s) of land has unique circumstances and long-term impacts determining any

SSFM International, Inc.

RECEIVED

3.9.2021

Mr. Zendo Kern, Director  
Department of Planning  
March 8, 2021  
Page

area(s) of potential effects. The Planning Department is central coordinating agency¹ for input. The Planning Department is responsible for managing Hawai'i County's General Plan (GP), including capital improvements and subsequent Community-level Development Plans (CDP), which, among other topics, focus on community engagement to identify best practices in the promotion and protection of equitable governance. We recommend consultation with stakeholders such as, but not limited to the following:

- Mauna Kea Soil and Water Conservation District
- Hawai'i Pacific Bird Habitat Joint Venture
- KAHEA: The Hawaiian-Environmental Alliance
- Mauna Kea Watershed Alliance

In closing, we also request the action be presented for input to the County's Cultural Resource Commission no later than the Draft EA. You may coordinate through our Planning Division; please contact Alex Roy (alex.roy@hawaiicounty.gov) with copies to myself.

Sincerely,

  
ZENDO KERN  
Planning Director

Cc:

**Approving Agency/Accepting Authority:**

Suzanne Case, DLNR  
Russell Tsuji, Chairman, BLNR, State of Hawai'i: DLNR, Land Division, (808) 587-0419, dlnr.land@Hawai'i .gov 1151 Punchbowl St., Room 220, Honolulu, HI 96813

**Applicant cc:**  
University of Hawaii Hilo

**Consultant:**  
SSFM

¹ HRS §46-18 Central coordinating agency



August 29, 2022

SSFM 2020_037.000

Mr. Zendo Kern, Director  
County of Hawai'i  
Planning Department  
101 Pauahi Street, Suite 3  
Hilo, HI 96720

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Kern,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA).

Section 4.2 of the Draft EA includes and evaluation of how the proposed project is in compliance with the County General Plan and applicable Community Development Plan.

A pre-assessment consultation letter has been sent to KAHEA: The Hawaiian-Environmental Alliance.

SSFM has added the Mauna Kea Soil and Water Conservation District, Hawaii Pacific Bird Habitat Joint Venture, and Mauna Kea Watershed Alliance to the mailing list and provided pre-assessment consultation letters to these organizations.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

DAVID Y. IGE  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
869 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813-5097

March 10, 2021

JADE T. BUTAY  
DIRECTOR

Deputy Director  
LYNN A.S. ARAKI-REGAN  
DEREK J. CHOW  
ROSS M. HIGASHI  
EDWIN H. SNIFFEN

IN REPLY REFER TO:  
DIR 0129  
HWY-PS 2.5274

Ms. Jennifer Scheffel  
Senior Environmental Planner  
SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, Hawaii 96720

Dear Ms. Scheffel:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment  
University of Hawaii (Hilo) Telescope Facility  
Mauna Kea, Hilo, Hawaii  
Tax Map Key No.: (3) 4-4-015: 012

Thank you for your letter dated February 8, 2021 and the opportunity to review the above-referenced project. The upcoming preparation of a Draft Environmental Assessment (DEA) required by Chapter 343, Hawaii Revised Statutes is due to the use of State land and State funds, and also the proposed use within the Conservation State Land Use District. The purpose of the DEA is to evaluate alternatives and various locations considered. The University of Hawaii at Hilo is proposing to create a new educational telescope facility at the Mid-Level Support Facility at Mauna Kea by year 2023.

The proposed work will include the installation of the 28-inch telescope with a 14-foot tall dome atop a new platform. The new facility will be connected to an existing building via a new walkway. The project site is accessible directly from the Mauna Kea Access Road.

The Hawaii Department of Transportation (HDOT) has the following comments:

1. We note that our jurisdiction on Mauna Kea Access Road ends 125 feet past the Visitor Center which is below the entrance to the Mid-Level Support Facilities. Therefore, the access point and this portion of the Mauna Kea Access Road leading to the project site (Mid-Level Support Facilities) are outside of the HDOT's jurisdiction.
2. A full evaluation is required on whether the proposed daily operation related to educational or visitor programs, special events and/or, typical trip patterns will have any local impacts to the roadways and nearby State highways. This should be provided in the DEA and/or if relevant, a Traffic Assessment or a Traffic Impact Analysis Report should be included and prepared by a traffic engineer licensed in the State of Hawaii.

Ms. Jennifer Scheffel  
March 10, 2021  
Page 2

HWY-PS 2.5274

3. A permit is required from the Highways Division, Hawaii District Office to transport oversized and overweight equipment/loads within our State Highway facilities.

If you have any questions, please contact Jeyan Thirugnanam, Systems Planning Engineer, Highways Division, Planning Branch at (808) 587-6336 or by email at [jeyan.thirugnanam@hawaii.gov](mailto:jeyan.thirugnanam@hawaii.gov). Please reference file review number PS 2021-029.

Sincerely,

A handwritten signature in black ink, appearing to read "Jade T. Butay".

JADE T. BUTAY  
Director of Transportation



August 29, 2022

SSFM 2020_037.000

Mr. Jade T. Butay  
State of Hawai'i  
Department of Transportation  
869 Punchbowl Street  
Honolulu, HI 96813-5097

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Butay,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM and the University of Hawai'i at Hilo (UH Hilo) acknowledge that the proposed project is located past the Hawai'i Department of Transportation's (HDOT) jurisdiction on Mauna Kea Access Road. Section 3.10 of the Draft EA includes an analysis of potential impacts to project roadways and nearby State highways. The need for a permit from the Highways Division, Hawai'i District to transport oversized and overweight equipment/loads on State highways will be included in the contract documents and will be the responsibility of the contractor.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

DAVID Y. IGE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

March 08, 2021

SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE  
MANAGEMENT

SSFM International, Inc.  
Attn: Ms. Jennifer M. Scheffel  
Sr. Environmental Planner  
99 Aupuni Street, Suite 202  
Hilo, Hawaii 96720

via email: [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com)

Dear Ms. Scheffel:

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the Proposed **University of Hawaii at Hilo New Educational Telescope Facility** located at Maunakea, Hamakua District, Island of Hawaii; TMK: (3) 4-4-015:012 on behalf of University of Hawaii at Hilo

Thank you for the opportunity to review and comment on the subject matter. The Land Division of the Department of Land and Natural Resources (DLNR) distributed or made available a copy of your request pertaining to the subject matter to DLNR's Divisions for their review and comments.

At this time, enclosed are comments from the (a) Engineering Division and (b) Land Division-Hawaii District on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: [darlene.k.nakamura@hawaii.gov](mailto:darlene.k.nakamura@hawaii.gov). Thank you.

Sincerely,

*Russell Tsuji*

Russell Y. Tsuji  
Land Administrator

Enclosures  
cc: Central Files

3/2/21

DAVID Y. IGE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

February 22, 2021

SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE  
MANAGEMENT

**MEMORANDUM**

TO:

**DLNR Agencies:**

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division ([DLNR_ENGR@hawaii.gov](mailto:DLNR_ENGR@hawaii.gov))
- Div. of Forestry & Wildlife ([rubyrosa.t.terrago@hawaii.gov](mailto:rubyrosa.t.terrago@hawaii.gov))
- Div. of State Parks
- Commission on Water Resource Management ([DLNR_CWRM@hawaii.gov](mailto:DLNR_CWRM@hawaii.gov))
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District ([gordon.c.heit@hawaii.gov](mailto:gordon.c.heit@hawaii.gov))

FROM:

Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT:

Pre-Assessment Consultation for Draft Environmental Assessment for the Proposed **University of Hawaii at Hilo New Educational Telescope Facility**

LOCATION:

Maunakea, Hamakua District, Island of Hawaii; TMK: (3) 4-4-015:012

APPLICANT:

SSFM International on behalf of University of Hawaii at Hilo

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **March 8, 2021**.

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at [darlene.k.nakamura@hawaii.gov](mailto:darlene.k.nakamura@hawaii.gov). Thank you.

- We have no objections.
- We have no comments.
- Comments are attached.

Signed:

Print Name:

Division:

Date:

*[Signature]*  
GORDON C. HEIT  
Land  
3/3/21

Attachments

cc: Central Files



DAVID Y. IGE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

March 3, 2021

**MEMORANDUM**

TO: Russell Y. Tsuji, Land Administrator

FROM: Candace Martin, Land Agent, HDLO *CM*

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for the Proposed University of Hawaii at Hilo New Educational Telescope Facility, Maunakea, Hamakua District, Island of Hawaii; TMK: (3) 4-4-015:012.

In response to your request for review and comment dated February 22, 2021 on the above referenced subject matter, we offer the following:

A review of the current general lease¹ issued to the University of Hawaii by the Board of Land and Natural Resources lists the character of use as follows:

“The Lessee shall use or allow the premises leased to be used solely for permanent mid-level facilities, a construction camp, an information station as well as existing facilities purposes.”

The lease also allows:

“**Commercial uses.** Lessee shall be allowed to sell astronomy-related items and to operate other concessions at the information station and at other University of Hawaii facilities on the premises. Lessee or a concessionaire shall be allowed to operate a service to shuttle visitors from the premises to the Mauna Kea summit for various activities and events; Lessee may charge visitors a fee for use of this service.”

Any uses other than those listed would require approval from the Board of Land and Natural Resources to amend the lease.

If you have any questions, please feel free to contact me at (808) 961-9590. Thank you.

¹ GL S-5529

SUZANNE D. CASE  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE  
MANAGEMENT



August 29, 2022

SSFM 2020_037.000

Mr. Russell Y. Tsuji, Land Administrator  
State of Hawai'i  
Department of Land and Natural Resources  
Land Division  
P.O. Box 621  
Honolulu, HI 96809

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Tsuji,

Thank you for distributing the pre-assessment consultation letter for the Draft Environmental Assessment (EA) to the divisions within the Department of Land and Natural Resources. We offer the following responses to the Engineering Division and Land Division-Hawaii District:

**Engineering Division**

Section 3.13 of the Draft EA includes a map with the Federal Emergency Management Agency's Flood Insurance Rate Map and an analysis of potential flood hazards associated with the proposed project. The proposed project would not have any water demand.

**Land Division – Hawaii District**

The proposed project includes the construction of a new educational telescope, which would be a “permanent mid-level facility.” Therefore, the proposed project is consistent with the current general lease issued to the University of Hawaii by the Board of Land and Natural Resources.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

PHONE (808) 594-1888



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
560 N. NIMITZ HWY., SUITE 200  
HONOLULU, HAWAII 96817

FAX (808) 594-1938

HRD20-9380B

March 4, 2021

Jennifer Scheffel  
Senior Environmental Planner  
SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, HI 96720

Re: Early Consultation in Preparation of a Draft Environmental Assessment  
University of Hawai'i at Hilo, New Educational Telescope Facility  
Ka'ohē Ahupua'a, Hāmākua Moku, Hawai'i Mokuupuni  
Tax Map Key: (3)4-4-015:012

Aloha e Ms. Scheffel:

The Office of Hawaiian Affairs (OHA) is in receipt of your letter dated February 8, 2021, inviting us to pre-assessment consultation for the draft environmental assessment (DEA) needed for the planned University of Hawai'i at Hilo (UHH) new educational telescope facility at the Halepōhaku mid-level facility on Maunakea. SSFM International, Inc., is preparing the DEA on behalf of the UHH pursuant to Hawai'i Revised Statutes (HRS) Chapter 343. The proposed action will include the following improvements at Halepōhaku: 28-inch telescope supported by a single pier (3 ft. above grade and 6 ft. below grade); a 14 ft. tall (18 ft. diameter) prefabricated clam-shell dome to cover the telescope; and, a new platform with a potential walkway connection to an existing building at Halepōhaku. As the current UHH telescope facility, Hōkū Ke'a, atop the summit of Maunakea is being planned for decommissioning, an alternative location is being sought. The notice indicates that while 16 alternative locations were evaluated, Halepōhaku is the preferred alternative.

As an initial matter, OHA emphasizes that Maunakea's lands, resources, and sites are of singular cultural value and significance to Native Hawaiians. Maunakea is considered the first born child of earth-mother Papa and sky-father Wākea, the progenitors of all Native Hawaiians, and thus the mauna serves as a physical connection to ancestral understandings of creation. Given the sacredness of this area, akua (divine ancestral energies) are known to inhabit the remote summit of Maunakea and physically manifest as various pu'u or features such as Lake Waiau. The appropriate management of such a sacred place is accordingly a matter of great concern to many in the Native Hawaiian community.

Jennifer Scheffel, SSFM  
Pre-Assessment Consultation for DEA – UH Hilo Learning Telescope at Halepōhaku  
March 4, 2021  
Page 2 of 5

Furthermore, OHA reiterates that the Maunakea lands at issue are part of the “ceded” lands trust that are also subject to the Public Land Trust.¹ Accordingly, the State of Hawai'i holds moral obligations of the highest responsibility and trust when dealing with Maunakea, as both “ceded” lands, to which Native Hawaiians maintain unrelinquished claims, and as Public Land Trust lands, which the Hawai'i State Constitution mandates must be held as “a public trust for native Hawaiians and the general public.”²

The following comments regarding 1) the expiration of the 2000 *Mauna Kea Science Reserve Master Plan*, 2) HRS Chapters 6E (historic preservation review) and 343 compliance, and 3) the assessment of impacts to cultural resources, should therefore be considered in conjunction with the great cultural significance of Maunakea to the Native Hawaiian community, as well as with the specific fiduciary obligations held by the State in its management and administration of Maunakea's lands and its natural and cultural environment.

#### Expiration of the 2000 *Mauna Kea Science Reserve Master Plan*

It is OHA's understanding that any development and planning actions at Maunakea undertaken by UH are currently guided by the 2000 *Mauna Kea Science Reserve Master Plan* (hereinafter “2000 Master Plan”). While the 2000 Master Plan does call for an expansion of telescope facilities as Halepōhaku, we note that the UH Board of Regents adopted the Master Plan “as the policy framework for the responsible stewardship and use of University-managed lands on Mauna Kea through the year 2020.” Therefore, the master plan itself is currently no longer the policy framework for use of these lands. It is further OHA's understanding that the 2000 Master Plan is currently in the process of being updated.

Moreover, OHA and the community have expressed longstanding concerns about UH's mismanagement on Maunakea. Currently, OHA is actively litigating against the State of Hawai'i and UH over UH's continued failure to adequately or appropriately implement numerous Comprehensive Management Plan actions.³ Governor David Ige expressly proclaimed that the state has “failed” the mountain and UH President David Lassner admitted that the university has “not yet met all of [its] obligations to the mountain or the expectations of the community.” Given these mismanagement concerns and the expiration of the 2000 Master Plan operational application, we believe moving forward with the construction of any new telescope is premature and should be delayed at least until a new Master Plan is approved by the UH Board of Regents. Any development not supported by an approved master plan would only be further evidence of mismanagement.

¹ See Complaint for Declaratory and Injunctive Relief, Accounting, Restitution, and Damages, *Office of Hawaiian Affairs vs. State of Hawai'i, et al.*, Civ. No. 17-1-1823-11 (JPC) (1st Cir. Ct.), filed Nov. 7, 2017, available at <https://www.oha.org/maunakea/>.

² Haw. Const. art. XII, § 4.

³ See OHA Complaint, *supra* note 1.

### HRS Chapters 6E and 343 Compliance

As the Hawai'i Administrative Rules (HAR) § 11-200.1-18 requires an analysis of impacts to the effected environment, OHA expects the DEA to include an analysis of archaeological and cultural resources since the historic and cultural surroundings are explicitly part of the definition of the environment pursuant to HAR § 11-200.1-2. Typically, sections devoted to analyzing impacts to historic and cultural resources are found within DEAs done in the State of Hawai'i. Procedurally, OHA has maintained that the identification portion of the HRS Chapter 6E review process should minimally be completed prior to the DEA as this will help to inform what historic properties stand to be impacted by the proposed action and allows the public to comment on any preliminary mitigations the applicant has to offer. **Without such information, OHA believes the HRS 343 process will not be fulfilled as legislatively intended.**

The intent of HRS Chapter 343 is to ensure a project's impact to the environment is fully considered in the planning process and to integrate mitigation where needed to minimize significant environmental harm. HAR § 11-200.1-18(d)(8) requires that proposed mitigations be included within the DEA. In determining whether historic properties will be adversely impacted, the HRS Chapter 6E review process is essential to identifying historic sites and generating mitigation commitments in consultation with the State Historic Preservation Division (SHPD). Typically, any resulting mitigations made during the HRS Chapter 6E review process are included in the DEA. If recommended mitigations or additional testing work is requested by SHPD at a later time, the DEA would then not be complete as required by the HARs promulgated under HRS Chapter 343. Deferring the HRS Chapter 6E review process would thus hide possible adverse impacts and mitigations from being included in the DEA, skewing any determination and limiting the public's chance to comment.

OHA notes that we were previously contacted for HRS Chapter 6E consultation in October 2020 and did provide a response on November 24. So, we are aware that HRS Chapter 6E has at least been initiated, but it is unknown whether identification efforts have been completed or if mitigations have been proposed. To date, OHA has not received a response to our inquiries regarding the age of prior archaeological work and whether or not HRS Chapter 6E consultation information would also be used to inform the DEA. While OHA still patiently awaits a response to our HRS Chapter 6E inquiry, we find the inquiry relevant to this DEA pre-assessment notice and thus will recapture our concerns here.

In regard to prior archaeological work, OHA specifically requested that the prior archaeological inventory survey (AIS) report referenced within the HRS Chapter 6E consultation invite be shared with consulting parties so that they may comment on the existing level of archaeological work and also better understand the project area's archaeological context. It is still unknown how old the AIS report is and whether or not updated archaeological work would be appropriate for the project area. Any comments from SHPD regarding the current HRS Chapter 6E effort and whether or not additional archaeological work will be required should further be provided to consulting parties for comment. Should additional identification efforts be needed,

OHA maintains that such work should be completed first prior to the release of the DEA for public comment.

In regard to information disclosure, it is OHA's stance that the applicant should disclose to consulting parties how any gathered information will be utilized. If the applicant intends to use information gathered from HRS Chapter 6E consultees for the HRS Chapter 343 process, OHA maintains it would be prudent for the applicant to get permission to use the information in such a manner.

### Assessment of Impacts to Cultural Resources

Guidelines for assessing cultural impacts are provided by the Office of Environmental Quality Control (OEQC) in the *Guide to Implementation and Practice of the Hawaii Environmental Policy Act*, Exhibit 1-1, 2012 Edition. These guidelines call for an analysis of cultural practices and resources located within "the broad geographical area in which the proposed project is located, as well as their direct or indirect significance or connection to the project site." Furthermore, the process should involve an attempt to consult with community members and cultural practitioners to ascertain ethnographic information on cultural resources and practices.

Historically, OHA has reviewed many DEAs that do not explicitly state methodologies for assessing cultural impacts or clear efforts to engage the community as part of the HRS Chapter 343 process as envisioned by the OEQC guidelines. OHA recommends that the OEQC guidelines be strictly followed in this case and that a robust outreach effort be conducted to interview community individuals and organizations regarding cultural practices and resources. While not specifically required by the rules or statute, the applicant may want to consider a formal cultural impact assessment (CIA) given the sensitive nature of Maunakea.

OHA would further like to remind the applicant that the approving agency for the DEA also has a responsibility to reasonably preserve and protect traditional and customary Native Hawaiian rights as required by Articles IX and XII of the State of Hawai'i Constitution. Article XII Section 7 of the State of Hawai'i Constitution states:

"the State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778..."

In *Ka Pa'akai O Ka 'Aina v. Land Use Commission*, 94 Haw. 31 (2000), hereinafter *Ka Pa'akai*, the Hawai'i Supreme Court reiterated the importance of Section 7 and reaffirmed that the State and its agencies, inclusive of the counties, are obligated to reasonably protect the traditional and customary rights of Hawaiians.

The *Ka Pa'akai* court decision set forth that a proper analysis of cultural impacts shall include: 1) the identity and scope of valued cultural, historical, or natural resources in the subject

Jennifer Scheffel, SSFM  
Pre-Assessment Consultation for DEA – UH Hilo Learning Telescope at Halepōhaku  
March 4, 2021  
Page 5 of 5

area, including the extent to which traditional and customary native Hawaiian rights are exercised; 2) the extent to which those resources – including traditional and customary native Hawaiian rights – will be affected or impaired by the proposed action; and, 3) the feasible action, if any, to be taken by the (agency) to reasonably protect native Hawaiian rights if they are found to exist. In OHA's experience, the construct for CIAs and cultural impact studies done as part of the HRS Chapter 343 process have often been used to satisfy these Ka Pa'akai requirements. In fact, some CIAs have explicitly referenced Ka Pa'akai requirements as being considered during development of the CIA's methodology. Thus, we would strongly encourage the applicant to work with the approving agency on any cultural impact study in a manner that could be beneficial to both parties and ensure compliance with both HRS Chapter 343 and Ka Pa'akai.

#### Closing Remarks

Mahalo for the opportunity to comment. OHA looks forward to seeing our comments pertaining to the expiration of the 2000 Master Plan, HRS Chapters 6E and 343 compliance, and the assessment of impacts to cultural resources addressed. More importantly, we hope the voices of Native Hawaiians are heard and identified cultural practices and resources are appropriately protected. Should you have any questions, please contact OHA's Lead Compliance Specialist, Kamakana C. Ferreira at (808) 594-0227 or by email at [kamakanaf@oha.org](mailto:kamakanaf@oha.org).

‘O wau iho nō me ka ‘oia ‘i‘o,



Sylvia M. Hussey, Ed.D.  
Ka Pouhana, Chief Executive Officer

SH:kf

CC: Keola Lindsey, Ke Kua ‘O Hawai‘i, OHA Hawai‘i Island Trustee  
Shane Akoni Palacat-Nelsen, OHA Community Outreach Advocate (Kona, Hawai‘i Island)



March 8, 2021

#### Ku Kia'i Mauna – Maunakea is Sacred August

Response of Wahine Practitioners to University of Hawaii/SSFM Pre-Assessment (Alleged) Consultation for a Draft Environmental Assessment for Hoku Ke'a:

Comments of Wahine Apapalani to SSFM Int. Re: UH "New Educational Telescope"

#### Background:

For years Hawaiians, including Wahine Apapalani, seeking to preserve & protect Mauna Kea have requested that the BLNR, the University of Hawaii & State follow State law by working with & Consulting with Hawaiian cultural & religious practitioners. Several requests have been made in direct testimony and through written correspondence by myself and other Hawaiian practitioners seeking to exercise rights defined & acknowledged in Article XII Section 7 of the Hawaii State Constitution and the First Amendment of the U.S. Constitution.

In addition, the State Auditors office has repeatedly found that the BLNR (and later the OMKM) had failed to adopt Administrative Rules, care for the Mauna and Consult with Hawaiian cultural practitioners. The Auditors findings & recommendations were ignored, during which time the State, BLNR and University of Hawaii have supported & funded over-development and commercial use of the Mauna by private and State parties, to the detriment of the biodiversity, environment, cultural resources and cultural & religious rights of Hawaiians.

Although 13 telescopes were approved, 22 building were constructed!

#### A. Wahine Practitioners prior efforts to work with OMKM, DLNR, & University:

Wahine practitioners submitting this testimony have tried for several years to work with those seeking to develop Mauna Kea (including State parties), to resolve the problems on Mauna Kea. Testimony has been submitted by Wahine individually at hearings for Mauna development going back for years to the Subaru, Keck and TMT telescope projects. Wahine supported & helped sponsor & organized the 3-year sunrise ceremonies called the Apapalani ceremonies that drew hundreds of practitioners and were held in conjunction with the Merry Monarch competitions to accommodate visiting Hawaiians & Statewide Halau.

Wahine practitioners were invited to participate in the discussions on the Mauna, and responded by submitting comments & testimony to the KKM on May 18, 2016 and on August 18, 2017. In our testimony of August 2017, we described ourselves, our religious & our cultural practices, the locations of our uses on the Mauna, as well as the problems we encountered.

We suggested 6 things that could be done to resolve these issues and ended with a request for "CONSULTATION". NO RESPONSE WAS EVER RECEIVED NOR WERE OUR REQUESTS FOR CONSULTATION EVER ACKNOWLEDGED.

We are renewing our request that UH & SSFI host real "Consultations" for Hawaiian cultural practitioners as part of the ongoing work of SSFM under its existing contract. Your representation that SSFM & UH presented this to the Maunakea Management Board & UH Board of Regents at a "public meeting" is not Consultation with Hawaiian practitioners. Outreach to practitioners by "Virtual Open House" fails to take into account the simple fact that many Hawaiian homes have no computer or connectivity.

BACKGROUND:

A. SSFI/UH RECOUNTING OF THE PROJECT HISTORY IS PATENTLY FALSE.

The real historical record can be found in the article entitled "Hope for Hokukea" that appeared in the Fall 2019 edition of Ke Kalakea – a UH publication. See attachment, "Hope for Hoku Kea", incorporated herein by reference & attachment.

Quotes: "The observatory was originally built in the 1960s for use by NASA and the US Air Force, according to the UH Hilo Educational Observatory (UHHEO) website. In 1970, the University of Hawaii acquired the telescope, then gave control of the telescope to UH Hilo's Astronomy and Physics Department in order to train undergraduates on the instrument in 2003. The old 24-inch telescope housed in the small observatory was replaced by a new, but defective, 36-inch [See: <https://hilo.hawaii.edu/news/kekalahea/hope-for-hoku-kea> Page 2 of 4 Hope for Hoku Kea 2/22/21"].

The old telescope & site were decommissioned & although significant State funds were used for the first telescope, it was defective & never worked. At the time UH agreed to accept the old discarded NASA facility, Hawaiian practitioners, including signatories to this comment, told the DLNR & UH that they needed to pursue and obtain an agreement with every telescope operator on the Mauna for Hawaii' student's to work with the operators to ensure educational opportunities for Hawaii's students at the telescopes being leased for job training & experience with & on the telescope technologies being used by astronomy on the Mauna. This recommendation was ignored.

2.

The UH accepted the old NASA facility to save NASA the cost & obligation of decommissioning the facility and removing the old building. Then the UH purchased a cheap telescope that never worked. "In a letter retrieved from the Department of Land and Natural Resources (DLNR) website from UH Hilo to the Office of Maunakea Management (OMM), on Sept. 2015, UH Hilo submitted a formal Notice of Intent to Decommission (NOI) for Hōkū Ke'a's current summit site." [See article sited above]. Since that time UH & the Maunakea Management authority have done nothing for UH students majoring in Astronomy. The telescope has been in storage!

B. Where we are now:

According to the SSFM Pre-Assessment letter, there is a need to use the Hale Pohaku for its students to 1) Increase Competition, 2) Recapture a "niche" for "hands on student learning", 3) Adapting to the Job market and 4) Outreach Efforts of the UH is limited by resources and the need UH has for an adequate facility is unsubstantiated by data and contradicts the statements of the UH when it initially justified accepting the old NASA facility. At that time, Hawaiians & the public were told that the UH needed the NASA facility because they had to be in the best location for Astronomy viewing, at the Summit with all the other telescopes. UH has said & continues to assert that they have many Astronomy students, this proved to be false. It was disclosed in 2018-19 that UH had only 2 students seeking degrees in Astronomy and that there was only 1 Hawaiian ever employed on the Summit by the private sector (Mr. Coleman) who passed in recent years.

**How many students does UH actually have majoring in Astronomy at this time?** Your document says that since 2000, the number of students in the USA has **tripled!!!** This is totally irrelevant – you are not dealing with the entire U.S., but Hawaii. The last time UH had to verify these data, it was unable to show more than 2 students – were pursuing BA's in Astronomy.

Conclusion:

Wahine practitioners request that UH & SSFM disclose when, where & how the "stakeholder meetings" will occur. Wahine practitioners request UH & SSFM send written notice of this Pre-Assessment effort to all Kupuna arrested on Maunakea, and Wahine practitioners request we be included in all communications relating to these meetings, and that UH and SSFM forward written and email communications, news postings. Send to Mililani B. Trask at this email: [mililani.trask@iclhawaii.com](mailto:mililani.trask@iclhawaii.com).

Mahalo,

Mililani B Trask  
On behalf on Wahine ApapaLani

3.

telescope in 2010. As a result, the site was unusable for stargazing, leaving students in UH Hilo's Astronomy program without a dedicated educational telescope. Since 2012, UH Hilo Astronomy professor Dr. R. Pierre Martin has been trying to rectify the situation. Martin, who's career has focused on operating astronomical observatories, led a team that looked at how to fix the defective telescope, only to finally decide to replace the instrument entirely. In 2016, a small, modern telescope and other state-of-the-art equipment, including a remote-operated dome, were purchased under his recommendation using a Capital Improvement Project grant. If the telescope is put on Maunakea, Martin says that it will be made available to not only students at UH Hilo, but open to high school students and other members of the public for educational purposes. The new telescope was assembled, and now sits in a lab at UH Hilo's Science and Technology Building (STB).

# Ke Kalaheea

- [Home](#)
- [Current Issue](#)
- [COVID-19 Updates](#)
- [Back Issues](#)
- [Instagram](#)

Facebook

Search:

## Hope for Hoku Kea

### **UH Board of Regents Motion to Place 28-Inch Educational Telescope on Maunakea**

**Copy Chief** *Elijah Kahula*



In a meeting on Oct. 16, the University of Hawai'i Board of Regents (BOR) brought forth a resolution including, among a series of other Maunakea management items, the new construction of an educational telescope away from Maunakea's summit.

Mentioned by name in the resolution, transcribed on University of Hawai'i News' website, the prime candidate location for the telescope is Hale Pohaku, a housing facility for astronomers and support staff below the summit of the mountain. The long resolution, featuring efforts to define and fast-track Maunakea management initiatives, including the decommissioning of a series of telescopes on the mountain, will be voted on by Regents in their next meeting at UH Hilo on Nov. 6.

Hökü Ke'a, the University of Hawai'i at Hilo's defunct, summit-situated educational observatory, has had a long and, recently, tumultuous history. The observatory was originally built in the 1960s for use by NASA and the US Air Force, according to the UH Hilo Educational Observatory (UHHEO) website. In 1970, the University of Hawaii acquired the telescope, then gave control of the telescope to UH Hilo's Astronomy and Physics Department in order to train undergraduates on the instrument in 2003.

The old 24-inch telescope housed in the small observatory was replaced by a new, but defective, 36-inch

telescope in 2010. As a result, the site was unusable for stargazing, leaving students in UH Hilo's Astronomy program without a dedicated educational telescope.

Since 2012, UH Hilo Astronomy professor Dr. R. Pierre Martin has been trying to rectify the situation. Martin, who's career has focused on operating astronomical observatories, led a team that looked at how to fix the defective telescope, only to finally decide to replace the instrument entirely.

In 2016, a small, modern telescope and other state-of-the-art equipment, including a remote-operated dome, were purchased under his recommendation using a Capital Improvement Project grant. If the telescope is put on Maunakea, Martin says that it will be made available to not only students at UH Hilo, but open to high school students and other members of the public for educational purposes. The new telescope was assembled, and now sits in a lab at UH Hilo's Science and Technology Building (STB).

With a telescope for UH Astronomy students finally in reach, other hurdles for students who wished to use Hökü Ke'a were arising. Despite the modern telescope's approval for purchase having gone through already, the summit site for Hökü Ke'a was marked to be removed from the mountain in 2015 by the Board of Regents before an alternate site had been approved.

In a letter retrieved from the Department of Land and Natural Resources' (DLNR) website from UH Hilo to the Office of Maunakea Management (OMM), on Sept. 2015, UH Hilo submitted a formal Notice of Intent to Decommission (NOI) for Hökü Ke'a's current summit site. The mission of decommissioning telescopes is to return sites to as close to their original natural form as possible.

Addressing the concern of environmental impacts of the newly-proposed Hökü Ke'a location, Martin says that besides its satisfactory elevation and low light pollution, Hale Pohaku was selected in part because it is on already-broken ground. Because of the small size, he says, the observatory including the telescope and dome can be built on a 20 by 20-foot slab of concrete situated between Hale Pohaku's other facilities.

The decommissioning selection was the result of an effort to comply to Governor Ige's 10-point plan for the improved management of Maunakea, which included bringing down at least 25 percent (at least 3) of the 13 telescopes currently on the summit.

Though the NOI also featured the possibility of a future educational telescope at a different site on the mountain, students would be without a dedicated training telescope in the meantime. "The educational needs that Hökü Ke'a was intended to meet will instead be met with observing time on other Maunakea telescopes and possible future installation of an educational telescope at an alternate site away from the Maunakea summit," reads the NOI. Since Hökü Ke'a's current site on the mountain still housed a non-operational telescope at the time (which has since been removed from its housing), the decision to decommission the site may have seemed obvious to the BOR.

The plan was met with opposition by community stakeholders in astronomy and education, however. In May 2016, the series of public comments prompted the Maunakea Management Board (MMB) to defer the decommissioning of the telescope site until further community input was collected.

In a meeting in September 2019, more than three years after the initial deferment, MMB held another public hearing on the telescope, as well as its possible relocation. Among others, Callie Crowder, an alumni of the Physics and Astronomy Department at UH Hilo and remote observer at the Canada France Hawaii Telescope (CFHT), spoke to advocate for the need of an educational telescope on the mountain.

In a video of the testimony by Hawaii Video News Now, Crowder states, "Today, Hoku Kea sits in a windowless room and has for three years now. This is a giant waste of space, money, and scientific potential. It's a tremendous loss for every University of Hawai'i and high school student who could be using it right now."

In a phone interview, Crowder told Ke Kalahea that she attributes her current position directly to the experience she gained her senior year in working with Dr. Martin to set up and operate the new Hoku Kea telescope. She claims that it was a critical experience that resulted in gaining her current position for the CFHT. For students seeking careers in astronomy to have experience with operating a telescope is invaluable, says Crowder.

Martin echoes this sentiment. "Our students have been suffering from a lack of this telescope for years now," he says.

According to Martin, the list of educational opportunities that the new, state-of-the-art telescope will allow is long. He says the telescope will allow observers to monitor asteroids, comets, chemical evolutions in stars and supernovas, and impacts on the moon, among many other capabilities. Because the telescope can be operated remotely and would become a part of an international network of astronomy, the telescope would be able to track phenomena occurring in very short time periods.

Martin says that the major advantage Hōkū Ke'a would offer to students is extensive time and autonomy using the telescope, an invaluable resource for training budding astronomers. Having ample time on a telescope allows students to design and conduct research projects that would enable them valuable praxis, including constructive learning opportunities from error. Martin says, "I don't mind if people make mistakes. If [a student] takes a picture on it on accident, so be it. That means they'll learn something."

Should the BOR vote to pass the resolution, the university's target deadline for Hōkū Ke'a's construction will be April 2021.

© 2021, University of Hawai'i at Hilo, an Equal Opportunity/Affirmative Action and Title IX institution and a campus of the University of Hawai'i system.



August 29, 2022

SSFM 2020_037.000

Ms. Sylvia M. Hussey, Ed.D,  
Ka Pouhana, Chief Executive Officer  
State of Hawai'i  
Office of Hawaiian Affairs  
560 N. Nimitz Highway, Suite 200  
Honolulu, HI 96817

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Dr. Hussey,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM and the University of Hawaii at Hilo (UH Hilo) provide the following responses to your comments:

**Expiration of the 2000 Mauna Kea Science Reserve Master Plan**

SSFM and UH Hilo acknowledge that the 2000 Mauna Kea Science Reserve Master Plan is in the process of being updated.

**HRS Chapters 6E and 343 Compliance**

UH Hilo has initiated consultation with the State Historic Preservation Division (SHPD) in compliance with Hawaii Revised Statutes (HRS) Chapter 6E. An Archaeological Literature Review is currently in progress and will be included as an appendix to the Draft EA as well as submitted to SHPD as part of the HRS Chapter 6E process. The Draft EA will include the status of HRS Chapter 6E consultation and all written communication with SHPD.

**Assessment of Impacts to Cultural Resources**

A Cultural Setting Report is currently in progress and will be included as Appendix A to the Draft EA. The Cultural Setting Report will follow the guidelines for assessing cultural impacts provided by the Office of Environmental Quality Control (OEQC) and address the analysis prescribed in *Ka Pa'akai O Ka 'Aina v. Land Use Commission*.



UH Hilo New Educational Telescope Facility  
Response to Pre-Assessment Consultation Comments

Page 2

August 29, 2022

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner



**DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I**  
 345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAI'I 96720  
 TELEPHONE (808) 961-8050 • FAX (808) 961-8657

March 11, 2021

Ms. Jennifer Scheffel  
 SSFM International, Inc.  
 99 Aupuni Street, Suite 202  
 Hilo, HI 96720

SSFM International, Inc.  
**RECEIVED**  
 3/16/2021

Dear Ms. Scheffel:

**Subject: Pre-Environmental Assessment Consultation for Draft Environmental Assessment  
 University of Hawai'i at Hilo New Educational Telescope Facility  
 Maunakea, Hāmākua District, Island of Hawai'i  
 Tax Map Key (3) 4-4-015:012**

This is in response to your Pre-Environmental Assessment Consultation request dated February 8, 2021.

We have no comments or objections as there are no Department of Water Supply facilities in the area that will be affected.

Should there be any questions, please contact Mr. Ryan Quitoriano of our Water Resources and Planning Branch at 961-8070, extension 256.

Sincerely yours,

Keith K. Okamoto, P.E.  
 Manager-Chief Engineer

RQ:dfg

... *Water, Our Most Precious Resource* ... *Ka Wai A Kāne* ...  
 The Department of Water Supply is an Equal Opportunity provider and employer.



August 29, 2022

SSFM 2020_037.000

Mr. Keith K. Okamoto, P.E., Manager-Chief Engineer  
 County of Hawai'i  
 Department of Water Supply  
 345 Kekūanaō'a Street, Suite 20  
 Hilo, HI 96720

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
 Maunakea, Hāmākua District, Island of Hawai'i  
 Tax Map Key (TMK): (3) 4-4-015:012  
 Response to Pre-Assessment Consultation Comments**

Dear Mr. Okamoto,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM and the University of Hawai'i at Hilo (UH Hilo) acknowledge that there are no Department of Water Supply facilities that would be affected.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
 Sr. Environmental Planner

99 Aupuni Street | Suite 202 | Hilo, Hawaii 96720 | Tel 808.933.2727 | Fax 855.329.7736 | [www.ssfm.com](http://www.ssfm.com)  
 Planning | Project & Construction Management | Structural, Civil & Traffic Engineering

**Jennifer Scheffel**

---

**From:** Kuloloio, Manuel M (US) <manuel.kuloloio@baesystems.com>  
**Sent:** Monday, March 15, 2021 4:12 PM  
**To:** Jennifer Scheffel  
**Cc:** Kuloloio, Manuel M (US); manuel.kuloloio@gmail.com  
**Subject:** Aloha Ms. Jennifer Scheffel; Manuel WMD Kuloloio, KULOLOIA 'Ohana  
**Attachments:** Kuloloia, O'ahu in 1810.pdf; Moku'ula and Kuloloia, Waine'e, Maui.pdf

Aloha Ms. Scheffel,

**RE: University of Hawai'i at Hilo New Educational Telescope Facility at Halepohaku, Mauna Kea, Hamakua District, Island of Hawai'i; Pre-Assessment Consultation for Draft Environmental Assessment**

Jennifer, I am in receipt of your February 8, 2021 letter, US Post marked FEB 10 2021, received this weekend at my Royal Kunia, O'ahu residence.

You state that the selected site within Halepohaku provides desirable teaching, access, and astronomical conditions, and "(t)he telescope would be mostly operated remotely from the UH Hilo campus or used in a full robotic mode."

I have had the privilege and honour to visit the Halepohaku facilities and telescopes atop Mauna Kea under the auspices of the University of Hawaii, Institute for Astronomy. WE thank you and SSFM International for your Subject Matter Expertise, thoughtful review, and care in the malama of this special place and sensitive tasking.

My expectation is that any debris, waste, gray water, and sewage generated from any activity and/or any personnel associated with this New Halepohaku Educational Telescope be collected (in accordance with the BEST of the Best Management Practices) and disposed "off-site", as its final disposition. I would expect that there be appropriate temporary storage facilities to accommodate this future planned usage at its MAXIMUM potential, to preclude any despoiling of such sacred and special sites under our State of Hawaii control and stewardship and to preclude violation of its sanctity and high intention. My expectation is that any person associated with this project be given a mandatory INDOCTRINATION Program, of sorts, that includes an "Environmental Awareness, Protection, and Stewardship Training" briefing, in much the same manner we conducted "Safety and Cultural Awareness Training" for the Model and Omnibus Kaho'olawe Island UXO Clearance Programs under the auspices of the US Navy; each person will attest their understanding and acknowledgement with a name, signature and dated Objective Quality Evidence. WE need to be hypervigilant and hold each other accountable, if the highest is the most sacred, and Mauna Kea is the most highest in Hawai'i Nei.

Thank you for your letter. I pray this finds you and your loved ones safe, healthy, and in good spirits in the *pu'uhonua* of family and home.

*E leha aku au i ko'u mau maka i na mauna,  
Malaila mai ko'u kokua e hiki mai ai.  
Mai lehova mai ko'u kokua,  
Nana no i hana i ka lani a me ka honua.  
Halelu (Psalms) 121: 1-2*

**LA'A; MA'A; PA'A!**

Aloha Ke Akua,  
Me Ke Aloha Maluhia,

Manny Kuloloia

**Manuel Makahiapo Kuloloio**  
Quality Assurance Manager  
Ship Repair, Hawaii Shipyards  
BAE Systems Platforms & Services  
BAE Systems, Inc.

**M:** 808 479 2377 | **E:** [manuel.kuloloio@baesystems.com](mailto:manuel.kuloloio@baesystems.com)  
Bravo 13, Pearl Harbor, Hawai'i, 96860, U.S.A.  
[www.baesystems.com](http://www.baesystems.com)

Connect with **BAE Systems:** 

**IMPORTANT!** This e-mail, including all attachments, constitute BAE Systems records and property that is intended only for the use of the individual or entity to which it is addressed. It also may contain information that is privileged, proprietary, or otherwise protected from disclosure under applicable law. If the reader of this e-mail transmission is not the intended recipient or the employee or agent responsible for delivering the transmission to the intended recipient, you are hereby notified that any dissemination, distribution, copying or use of this e-mail or its contents is strictly prohibited. If you have received this e-mail in error, please notify the sender by responding to the e-mail and then delete the e-mail immediately.





August 29, 2022

SSFM 2020_037.000

Mr. Manuel M. Kuloloio  
EMAIL: [manuel.kuloloio@basesystems.com](mailto:manuel.kuloloio@basesystems.com)

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Kuloloio,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA).

The Draft EA includes Best Management Practices to minimize impacts from construction and operation of the Proposed Action, including those to solid waste, wastewater, hazardous materials, water quality, soils, air quality, and noise. Measures have also been identified to minimize impacts to biological and cultural resources. In compliance with the Mauna Kea Comprehensive Management Plan, this includes an education program regarding the historical, cultural, and biological significance of Maunakea. The education program will be required for all persons involved with construction activities (including, but not limited to, the construction manager, contractors, supervisors, and all construction workers), and all persons involved in operation and maintenance activities (including, but not limited to, scientists and support staff).

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner



DEPARTMENT OF THE ARMY  
HONOLULU DISTRICT, U.S. ARMY CORPS OF ENGINEERS  
FORT SHAFTER, HAWAII 96858-5440

May 12, 2021

SUBJECT: University of Hawaii at Hilo, New Educational Telescope Facility,  
Maunakea, Island of Hawaii, HI, Department of the Army File No. POH-2021-00043

Ms. Ligaya Hill  
University of Hawaii  
200 W Kawili Street  
Hilo, Hawaii 96720

Dear Ms. Hill:

The Honolulu District, U.S. Army Corps of Engineers (Corps), Regulatory Branch received your letter requesting consultation for the proposed construction of a new educational telescope facility, Maunakea, Island of Hawaii, HI. Your request has been assigned Department of the Army (DA) file number POH-2021-00043. Please reference this number in all future correspondence with our office relating to this action.

Based on the limited information provided in regard to your proposed development project, the Corps is unable to determine if your project would be located in a jurisdictional waters of the United States (U.S.)

The Corps authorities are based on two laws: Section 404 of the Clean Water Act (33 U.S.C. 1344; "Section 404") and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403; "Section 10").

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Alaska District.

- 2 -

DA authorization is required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands and/or perform work in navigable waters of the U.S.

To make a request for a jurisdictional determination, please visit our website at <https://www.poh.usace.army.mil/Portals/10/docs/jurisdictionaldeterminations/JD%20Request%20form%20POH%20Nov%202016.pdf> to obtain a Request for Corps Jurisdictional Determination form and contact information for submission. Please be advised that whether or not a DA permit is required for your proposed project, you are responsible for obtaining all other applicable Federal, state, or local authorizations required by law.

Thank you for your cooperation with the Honolulu District Regulatory Program. Should If you have any questions related to this determination, please contact me via e-mail at [Kristi.D.Fluker@usace.army.mil](mailto:Kristi.D.Fluker@usace.army.mil). You are encouraged to provide comments on your experience with the Honolulu District Regulatory Office by accessing our web-based customer survey form at [http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey](http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey). For additional information about our Regulatory Program, please visit our web site at <http://www.poh.usace.army.mil/Missions/Regulatory.aspx>.

Sincerely,

Kristi D. Fluker  
Regulatory Specialist

Cc: Jennifer Scheffel [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com)



August 29, 2022

SSFM 2020_037.000

Ms. Kristi Fluker, Biologist/Regulatory Specialist  
U.S. Army Corps of Engineers  
Honolulu District  
EMAIL: [Kristi.D.Fluker@usace.army.mil](mailto:Kristi.D.Fluker@usace.army.mil)

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Ms. Fluker,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). All future correspondence will reference Project Number POH-2021-00043. The University of Hawai'i at Hilo (UH Hilo) looks forward to further consultation, as needed.

As documented in Section 3.6 of the Draft EA, there are no waters of the U.S. within the project area. Therefore, there will be no requirement for a jurisdictional determination from the U.S. Army Corps of Engineers.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

**Jennifer Scheffel**

---

**From:** Bimo Akiona <bimoakiona@yahoo.com>  
**Sent:** Tuesday, February 16, 2021 2:11 PM  
**To:** Jennifer Scheffel  
**Subject:** UHHH Educational Telescope

Email received from EXTERNAL sender. Confirm the content is safe prior to opening attachments or links.

Hi,  
I've received letter regarding the subject.  
Where can I find data supporting the statements after INCREASING COMPETITION, and Recapturing UH Hilo's niche...  
Thank you.  
*Bimo Akiona*  
808-896-1033



August 29, 2022

SSFM 2020_037.000

Mr. Bimo Akiona  
EMAIL: [bimoakiona@yahoo.com](mailto:bimoakiona@yahoo.com)

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Akiona,

Thank you for your February 16, 2021, response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). Benefits of the proposed project are included in Section 1.5 of the Draft EA.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

**James A. Monk**  
87-3599 Mamalahoa Highway  
Captain Cook, HI 96704-8712  
(808) 328-1666  
Cell (516) 922-MONK

February 16, 2021

SSFM International, Inc.  
Attn: Jennifer Scheffel  
99 Aupuni Street, Ste 202  
Hilo, HI 96720

SSFM International, Inc.  
**RECEIVED**  
3.4.2021

Dear Ms Scheffel:

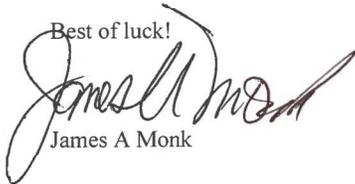
The top of Mauna Kea is one of the outstanding astronomical observatory locations in the world and has been so for many decades. Adding a new 28-inch telescope to this location will provide additional employment for the Hawaiian economy, bring cutting edge technology, science and educational opportunities to our communities and be a natural fit with the other observatories already located on the summit. It will enable the University of Hawaii Hilo Astronomy Program to continue being a world-class teaching operation, helping the youth of our state to stay here with good paying jobs.

The impact of this project on the mountain, the atmosphere and the biosphere will be almost totally negligible, while the economic, scientific and educational impacts will be very positive. The proposed site has been used previously and the new construction will enhance and clean it up.

Any claims that this project would somehow violate the sanctity of the mountain space is nothing but an attempt by a small minority of individuals to obstruct progress. This particular telescope and its attendant facilities will be totally unseen on the slopes of Mauna Kea.

Please make this project a success in Hawaii.

Best of luck!

  
James A Monk



August 29, 2022

SSFM 2020_037.000

Mr. James A. Monk  
87-3599 Māmalahoa Highway  
Captain Cook, HI 96704-8712

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Monk,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). The University of Hawai'i at Hilo (UH Hilo) appreciates your support for the proposed New Educational Telescope project

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.



Jennifer M. Scheffel  
Sr. Environmental Planner

DAVID Y. IGE  
GOVERNOR



CURT T. OTAGURO  
COMPTROLLER  
AUDREY HIDANO  
DEPUTY COMPTROLLER

STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P)21.022

FEB 17 2021

**SSFM International, Inc.**  
**RECEIVED**  
*3-4-2021*

Ms. Jennifer Scheffel  
SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, Hawaii 96720

Dear Ms. Scheffel:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment  
University of Hawaii at Hilo  
New Educational Telescope Facility  
Maunakea, Hamakua District, Island of Hawaii  
Tax Map Key (TMK): (3) 4-4-015:012

Thank you for the opportunity to provide comments on the subject project. The project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, your staff may call Mr. David DePonte of the Planning Branch at 586-0492, or email at [david.c.deponte@hawaii.gov](mailto:david.c.deponte@hawaii.gov).

Sincerely,

CHRISTINE L. KINIMAKA  
Public Works Administrator

DD

c: Ms. Mari Joy Angsioco, DAGS Hawaii District



August 29, 2022

SSFM 2020_037.000

Ms. Christine L. Kinimaka, Public Works Administrator  
State of Hawai'i  
Department of Accounting and General Services  
P.O. Box 119  
Honolulu, HI 96810-0119

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Ms. Kinimaka,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM and the University of Hawai'i at Hilo (UH Hilo) acknowledge that the project does not impact any of the Department of Accounting and General Services' (DAGS) projects or existing facilities, and that DAGS has no comments to offer at this time.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

PO Box 1043  
Naalehu HI 96772  
Feb 17 2021

SSFM International Inc  
Attn: Jennifer Scheffel  
99 Aupuni Street  
Hilo HI 96720

**SSFM International, Inc**  
**RECEIVED**

*3.4.2021*

Dear Ms. Scheffel

I am writing to express our strong support for a new high quality teaching telescope on Mauna Kea.

As a mountain in the middle of an ocean, Mauna Kea is perhaps the best location in the planet for optical microscopy and Hawaii island should be the location of a world class astronomy facility and school. Such a facility clearly needs a state of the art teaching telescope for UH students.

The telescope should be available not just for the students who will become professional astronomers but for students in other disciplines so that UH can encourage a greater awareness of the importance of astronomy in the wider community. This would hopefully go so way to counter the unfortunate tendency in the local community to prefer backward looking attitudes based on mythology rather than the quest to understand some of the fundamental questions of the creation of our planetary system and the universe.

Sincerely



Dr. Dennis F. Elwell  
Mrs. Carol A. Elwell



August 29, 2022

SSFM 2020_037.000

Dr. Dennis F. Elwell  
Mrs. Carol A. Elwell  
P.O. Box 1043  
Nā'ālehu, HI 96772

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Dr. and Mrs. Elwell,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). The University of Hawai'i at Hilo (UH Hilo) appreciates your support for the proposed New Educational Telescope project.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.



Jennifer M. Scheffel  
Sr. Environmental Planner



August 29, 2022

SSFM 2020_037.000

Mr. Jim Skibby  
P.O. Box 213  
Kailua-Kona, HI 96745

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Skibby,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). The University of Hawai'i at Hilo (UH Hilo) appreciates your support for the proposed New Educational Telescope project.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

February 17, 2021

SSFM International, Inc.  
**RECEIVED**

3-4-2021

Dear Jennifer Scheffel,

Thank you for including us in your request for comments about the construction of a new educational telescope on Mauna Kea. As retired teachers, my wife and I both encourage the construction of this telescope. I think that the more educational opportunities we can provide for our children the better. After all, if our little speck in the mid-pacific can produce Nobel Prize winning chemists, why not do the same for astronomy. This would be a first step to that goal. So, yes, let's build it!

Jim Skibby  
PO Box 213  
Kailua Kona, HI 96745

[jskibby@hawaii.rr.com](mailto:jskibby@hawaii.rr.com)  
808.326.3297

**Jennifer Scheffel**

---

**From:** Speerstra, Linda CIV USARMY CEPOH (USA) <Linda.Speerstra@usace.army.mil>  
**Sent:** Thursday, February 18, 2021 11:15 AM  
**To:** Jennifer Scheffel  
**Cc:** Fluker, Kristi D POH  
**Subject:** UofH Educational Telescope Facility - Maunakea Island of Hawaii  
**Attachments:** scannedDoc.pdf  
**Signed By:** linda.speerstra.civ@mail.mil

Aloha Jennifer, thank you for reaching out in regards to the new educational telescope facility proposal located on Maunakea. I've assigned your project to Kristi Fluker. She will be reaching out to you shortly with a project number. Linda

Linda Speerstra  
Chief, Regulatory Branch  
U.S. Army Corps of Engineers  
Honolulu District  
808-835-4300



August 29, 2022

SSFM 2020_037.000

Ms. Linda Speerstra, Chief, Regulatory Branch  
U.S. Army Corps of Engineers  
Honolulu District  
EMAIL: [Linda.Speerstra@usace.army.mil](mailto:Linda.Speerstra@usace.army.mil)

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Ms. Speerstra,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). Kristi Fluker provided Project Number POH-2021-00043 on February 18, 2021. The University of Hawai'i at Hilo looks forward to further consultation, as needed.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

**Mitchell D. Roth**  
Mayor

**Lee E. Lord**  
Managing Director



**Robert R.K. Perreira**  
Acting Fire Chief

**County of Hawai'i**  
**HAWAI'I FIRE DEPARTMENT**  
25 Aupuni Street • Suite 2501 • Hilo, Hawai'i 96720  
(808) 932-2900 • Fax (808) 932-2928

February 19, 2021

Jennifer M. Scheffel  
Sr. Environmental Planner  
SSFM International  
99 Aupuni Street, Suite 202  
Hilo, HI 96720

Dear Ms. Scheffel:

RE: Pre-Assessment Consultation for Draft Environmental Assessment  
University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
TMK: (3) 4-4-015:012

In regard to your request dated February 8, 2021, for the above-entitled matter, the following shall be in accordance:

**NFPA 1, UNIFORM FIRE CODE, 2006 EDITION**

*Note: Hawai'i State Fire Code, National Fire Protection Association 2006 version, with County of Hawai'i amendments. County amendments are identified with a preceding "C~" of the reference code.*

**Chapter 18 Fire Department Access and Water Supply**

**18.1 General.** Fire department access and water supplies shall comply with this chapter.

For occupancies of an especially hazardous nature, or where special hazards exist in addition to the normal hazard of the occupancy, or where access for fire apparatus is unduly difficult, or areas where there is an inadequate fire flow, or inadequate fire hydrant spacing, and the AHJ may require additional safeguards including, but not limited to, additional fire appliance units, more than one type of appliance, or special systems suitable for the protection of the hazard involved.

**18.1.1 Plans.**

**18.1.1.1 Fire Apparatus Access.** Plans for fire apparatus access roads shall be submitted to the fire department for review and approval prior to construction.



Jennifer M. Scheffel, Sr. Environmental Planner  
February 19, 2021  
Page 2 of 8

**18.1.1.2 Fire Hydrant Systems.** Plans and specifications for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction.

**C~ 18.1.1.2.1 Fire Hydrant use and Restrictions.** No unauthorized person shall use or operate any Fire hydrant unless such person first secures permission or a permit from the owner or representative of the department, or company that owns or governs that water supply or system. Exception: Fire Department personnel conducting firefighting operations, hydrant testing, and/or maintenance, and the flushing and acceptance of hydrants witnessed by Fire Prevention Bureau personnel.

**18.2 Fire Department Access.**

**18.2.1** Fire department access and fire department access roads shall be provided and maintained in accordance with Section 18.2.

**18.2.2* Access to Structures or Areas.**

**18.2.2.1 Access Box(es).** The AHJ shall have the authority to require an access box(es) to be installed in an accessible location where access to or within a structure or area is difficult because of security.

**18.2.2.2 Access to Gated Subdivisions or Developments.** The AHJ shall have the authority to require fire department access be provided to gated subdivisions or developments through the use of an approved device or system.

**18.2.2.3 Access Maintenance.** The owner or occupant of a structure or area, with required fire department access as specified in 18.2.2.1 or 18.2.2.2, shall notify the AHJ when the access is modified in a manner that could prevent fire department access.

**18.2.3 Fire Department Access Roads. (*may be referred as FDAR)**

**18.2.3.1 Required Access.**

**18.2.3.1.1** Approved fire department access roads shall be provided for every facility, building, or portion of a building hereafter constructed or relocated.

**18.2.3.1.2** Fire Department access roads shall consist of roadways, fire lanes, parking lots lanes, or a combination thereof.

**18.2.3.1.3*** When not more than two one- and two-family dwellings or private garages, carports, sheds, agricultural buildings, and detached buildings or structures 400ft² (37 m²) or less are present, the requirements of 18.2.3.1 through 18.2.3.2.1 shall be permitted to be modified by the AHJ.

**18.2.3.1.4** When fire department access roads cannot be installed due to location on property, topography, waterways, nonnegotiable grades, or other similar conditions, the AHJ shall be authorized to require additional fire protection features.

**18.2.3.2 Access to Building.**

**18.2.3.2.1** A fire department access road shall extend to within in 50 ft (15 m) of at least one exterior door that can be opened from the outside that provides access to the interior of the building. Exception: 1 and 2 single-family dwellings.

**18.2.3.2.1.1** When buildings are protected throughout with an approved automatic sprinkler system that is installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, the distance in 18.2.3.2.1 shall be permitted to be increased to 300 feet.

**18.2.3.2.2** Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 ft (46 m) from fire department access roads as measured by an approved route around the exterior of the building or facility.

**18.2.3.2.2.1** When buildings are protected throughout with an approved automatic sprinkler system that is installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, the distance in 18.2.3.2.2 shall be permitted to be increased to 450 ft (137 m).

**18.2.3.3 Multiple Access Roads.** More than one fire department access road shall be provided when it is determined by the AHJ that access by a single road could be impaired by vehicle congestion, condition of terrain, climatic conditions, or other factors that could limit access.

**18.2.3.4 Specifications.**

**18.2.3.4.1 Dimensions.**

**C~ 18.2.3.4.1.1** FDAR shall have an unobstructed width of not less than 20ft with an approved turn around area if the FDAR exceeds 150 feet. **Exception:** FDAR for one and two family dwellings shall have an unobstructed width of not less than 15 feet, with an area of not less than 20 feet wide within 150 feet of the structure being protected. An approved turn around area shall be provided if the FDAR exceeds 250 feet.

**C~ 18.2.3.4.1.2** FDAR shall have an unobstructed vertical clearance of not less than 13ft 6 in.

**C~ 18.2.3.4.1.2.1** Vertical clearances may be increased or reduced by the AHJ, provided such increase or reduction does not impair access by the fire apparatus, and approved signs are installed and maintained indicating such approved changes.

**C~18.2.3.4.1.2.2** Vertical clearances shall be increased when vertical clearances or widths are not adequate to accommodate fire apparatus.

**C~ 18.2.3.4.2 Surface.** Fire department access roads and bridges shall be designed and maintained to support the imposed loads (25 Tons) of the fire apparatus. Such FDAR and shall be comprised of an all-weather driving surface.

**18.2.3.4.3 Turning Radius.**

**C~ 18.2.3.4.3.1** Fire department access roads shall have a minimum inside turning radius of 30 feet, and a minimum outside turning radius of 60 feet.

**18.2.3.4.3.2** Turns in fire department access road shall maintain the minimum road width.

**18.2.3.4.4 Dead Ends.** Dead-end fire department access roads in excess of 150 ft (46 m) in length shall be provided with approved provisions for the fire apparatus to turn around.

**18.2.3.4.5 Bridges.**

**18.2.3.4.5.1** When a bridge is required to be used as part of a fire department access road, it shall be constructed and maintained in accordance with county requirements.

**18.2.3.4.5.2** The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus.

**18.2.3.4.5.3** Vehicle load limits shall be posted at both entrances to bridges where required by the AHJ.

**18.2.3.4.6 Grade.**

**C~ 18.2.3.4.6.1** The maximum gradient of a Fire department access road shall not exceed 12 percent for unpaved surfaces and 15 percent for paved surfaces. In areas of the FDAR where a Fire apparatus would connect to a Fire hydrant or Fire Department Connection, the maximum gradient of such area(s) shall not exceed 10 percent.

**18.2.3.4.6.2*** The angle of approach and departure for any means of fire department access road shall not exceed 1 ft drop in 20 ft (0.3 m drop in 6 m) or the design limitations of the fire apparatus of the fire department, and shall be subject to approval by the AHJ.

**18.2.3.4.6.3** Fire department access roads connecting to roadways shall be provided with curb cuts extending at least 2 ft (0.61 m) beyond each edge of the fire lane.

**18.2.3.4.7 Traffic Calming Devices.** The design and use of traffic calming devices shall be approved the AHJ.

**18.2.3.5 Marking of Fire Apparatus Access Road.**

**18.2.3.5.1** Where required by the AHJ, approved signs or other approved notices shall be provided and maintained to identify fire department access roads or to prohibit the obstruction thereof of both.

**18.2.3.5.2** A marked fire apparatus access road shall also be known as a fire lane.

**18.2.4* Obstruction and Control of Fire Department Access Road.**

**18.2.4.1 General.**

**18.2.4.1.1** The required width of a fire department access road shall not be obstructed in any manner, including by the parking of vehicles.

**18.2.4.1.2** Minimum required widths and clearances established under 18.2.3.4 shall be maintained at all times.

**18.2.4.1.3*** Facilities and structures shall be maintained in a manner that does not impair or impede accessibility for fire department operations.

**18.2.4.1.4** Entrances to fire departments access roads that have been closed with gates and barriers in accordance with 18.2.4.2.1 shall not be obstructed by parked vehicles.

**18.2.4.2 Closure of Accessways.**

**18.2.4.2.1** The AHJ shall be authorized to require the installation and maintenance of gates or other approved barricades across roads, trails, or other accessways not including public streets, alleys, or highways.

**18.2.4.2.2** Where required, gates and barricades shall be secured in an approved manner.

**18.2.4.2.3** Roads, trails, and other access ways that have been closed and obstructed in the manner prescribed by 18.2.4.2.1 shall not be trespassed upon or used unless authorized by the owner and the AHJ.

**18.2.4.2.4** Public officers acting within their scope of duty shall be permitted to access restricted property identified in 18.2.4.2.1.

**18.2.4.2.5** Locks, gates, doors, barricades, chains, enclosures, signs, tags, or seals that have been installed by the fire department or by its order or under its control shall not be removed, unlocked, destroyed, tampered with, or otherwise vandalized in any manner.

**18.3 Water Supplies and Fire Hydrants**

**18.3.1*** A water supply approved by the county, capable of supplying the required fire flow for fire protection shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the

facility or building is in excess of 150 feet (45 720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ. For on-site fire hydrant requirements see section 18.3.3.

**EXCEPTIONS:**

1. When facilities or buildings, or portions thereof, are completely protected with an approved automatic fire sprinkler system the provisions of section 18.3.1 may be modified by the AHJ.
2. When water supply requirements cannot be installed due to topography or other conditions, the AHJ may require additional fire protection as specified in section 18.3.2 as amended in the code.
3. When there are not more than two dwellings, or two private garage, carports, sheds and agricultural. Occupancies, the requirements of section 18.3.1 may be modified by AHJ.

**18.3.2*** Where no adequate or reliable water distribution system exists, approved reservoirs, pressure tanks, elevated tanks, fire department tanker shuttles, or other approved systems capable of providing the required fire flow shall be permitted.

**18.3.3*** The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be provided on a fire apparatus access road on the site of the premises or both, in accordance with the appropriate county water requirements.

**18.3.4** Fire Hydrants and connections to other approved water supplies shall be accessible to the fire department.

**18.3.5** Private water supply systems shall be tested and maintained in accordance with NFPA 25 or county requirements as determined by the AHJ.

**18.3.6** Where required by the AHJ, fire hydrants subject to vehicular damage shall be protected unless located within a public right of way.

**18.3.7** The AHJ shall be notified whenever any fire hydrant is placed out of service or returned to service. Owners of private property required to have hydrants shall maintain hydrant records of approval, testing, and maintenance, in accordance with the respective county water requirements. Records shall be made available for review by the AHJ upon request.

**C~ 18.3.8** Minimum water supply for buildings that do not meet the minimum County water standards:

Buildings up to 2000 square feet, shall have a minimum of 3,000 gallons of water available for Firefighting.

Buildings 2001- 3000 square feet, shall have a minimum of 6,000 gallons of water available for Firefighting.

Buildings, 3001- 6000 square feet, shall have a minimum of 12,000 gallons of water available for firefighting.

Buildings, greater than 6000 square feet, shall meet the minimum County water and fire flow requirements.

Multiple story buildings shall multiply the square feet by the amount of stories when determining the minimum water supply.

Commercial buildings requiring a minimum fire flow of 2000gpm per the Department of Water standards shall double the minimum water supply reserved for firefighting.

Fire Department Connections (FDC) to alternative water supplies shall comply with 18.3.8 (1)-(6) of *this code*.

**NOTE: In that water catchment systems are being used as a means of water supply for firefighting, such systems shall meet the following requirements:**

- 1) In that a single water tank is used for both domestic and firefighting water, the water for domestic use shall not be capable of being drawn from the water reserved for firefighting;
- 2) Minimum pipe diameter sizes from the water supply to the Fire Department Connection (FDC) shall be as follows:
  - a) 4" for C900 PVC pipe;
  - b) 4" for C906 PE pipe;
  - c) 3" for ductile Iron;
  - d) 3' for galvanized steel.
- 3) The Fire Department Connection (FDC) shall:
  - a) be made of galvanized steel;
  - b) have a gated valve with 2-1/2 inch, National Standard Thread male fitting and cap;
  - c) be located between 8 ft and 16 ft from the Fire department access. The location shall be approved by the AHJ;
  - d) not be located less than 24 inches, and no higher than 36 inches from finish grade, as measured from the center of the FDC orifice;
  - e) be secure and capable of withstanding drafting operations. Engineered stamped plans may be required;
  - f) not be located more than 150 feet of the most remote part, but not less than 20 feet, of the structure being protected;
  - g) also comply with section 13.1.3 and 18.2.3.4.6.1 of *this code*.
- 4) Commercial buildings requiring a fire flow of 2000gpm shall be provided with a second FDC. Each FDC shall be independent of each other, with each FDC being capable of flowing 500gpm by engineered design standards. The second FDC shall be located in an area approved by the AHJ with the idea of multiple Fire apparatus' conducting drafting operations at once, in mind.

- 5) Inspection and maintenance shall be in accordance to NFPA 25.
- 6) The owner or lessee of the property shall be responsible for maintaining the water level, quality, and appurtenances of the system.

**EXCEPTIONS TO SECTION 18.3.8:**

- 1) Agricultural buildings, storage sheds, and shade houses with no combustible or equipment storage.
- 2) Buildings less than 800 square feet in size that meets the minimum Fire Department Access Road requirements.
- 3) For one and two family dwellings, agricultural buildings, storage sheds, and detached garages 800 to 2000 square feet in size, and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 1000 feet.
- 4) For one and two family dwellings, agricultural buildings, and storage sheds greater than 2000square feet, but less than 3000 square feet and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 500 feet.
- 5) For buildings with an approved automatic sprinkler system, the minimum water supply required may be modified.

If there are any questions regarding these requirements, please contact Assistant Fire Chief Ian Smith at (808) 932-2907.

Sincerely,



ROBERT R. K. PERREIRA  
Acting Fire Chief

RRKP:cf



August 29, 2022

SSFM 2020_037.000

Mr. Kazuo S.K.L. Todd, Fire Chief  
County of Hawai'i  
Hawai'i Fire Department  
25 Aupuni Street, Suite 2501  
Hilo, HI 96720

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Todd,

Thank you for your department's response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA) provided by former Acting Fire Chief Robert R.K. Perreira. The proposed project will comply with the measures in the NFPA, Uniform Fire Code, 2006 Edition, as applicable, as provided in your letter.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

Mitchell D. Roth  
Mayor



## County of Hawai`i

**POLICE DEPARTMENT**  
349 Kapi`olani Street • Hilo, Hawai`i 96720-3998  
(808) 935-3311 • Fax (808) 961-2389

Paul K. Ferreira  
Police Chief

Kenneth Bugado Jr.  
Deputy Police Chief



August 29, 2022

SSFM 2020_037.000

February 23, 2021

SSFM International, Inc.  
**RECEIVED**  
3.4.2021

SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, HI 96720

ATTENTION: JENNIFER SCHEFFEL

Subject: University of Hawaii at Hilo New Educational Telescope Facility  
Maunakea, Hamakua District, Island of Hawaii  
Tax Map Key (TMK): (3) 4-4-015:012  
Pre-Assessment Consultation for Draft Environmental Assessment

The above proposed project is slated to be constructed on State of Hawaii land at Halepohaku, a State of Hawaii facility, and as such we have no comment or position on the matter.

Thank you for giving us an opportunity to review your project.

Please contact Captain Reed Mahuna, commander of the South Hilo Patrol Division, at 961-2214 or via e-mail at [reed.mahuna@hawaiicounty.gov](mailto:reed.mahuna@hawaiicounty.gov) should you need any further assistance in this matter.

JAMES B. O'CONNOR  
ASSISTANT POLICE CHIEF  
AREA I OPERATIONS

RM:ll/21HQ0155

Mr. James B. O'Connor, Assistant Police Chief  
Area I Operations  
County of Hawai`i  
Police Department  
349 Kapi`olani Street  
Hilo, HI 96720-3998

**SUBJECT: University of Hawai`i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai`i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. O'Connor,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM and the University of Hawai`i at Hilo (UH Hilo) acknowledge that the County of Hawai`i Police Department has no comment or position on the proposed project.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

Pepelu'ali 23, 2021

SSFM International, Inc. ATTM:

Jennifer Scheffel

99 Aupuni Street, Suite 202

Hilo, HI 96720

**SSFM International, Inc.**  
**RECEIVED**  
3.4.2021

Dear Sirs:

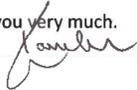
Thank you for giving me the opportunity to voice my mana'o to your development on Mauna A Wakea.

I am against your intentions of building any structure on this sacred mauna/mountain to put it lightly. As an indigenous Hawaiian born and raised on Moku o Keawe and over some 60 years, I have witnessed all that was promised not come to filtration.

Therefore, please stop your desecration of our mountain. You have not employed any local people that are struggling and without a degree after you have built your buildings and leaving it up there to rot away in the wind with only false promises. Enough is enough. No more developing of any sort of any areas on any of our mountains here on my island "Moku o Keawe which I call home.

Thank you very much.

Kawehi



kkn.



August 29, 2022

SSFM 2020_037.000

Kawehi

[No contact info provided. Response included in Draft EA only.]

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Kawehi,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). The University of Hawai'i at Hilo (UH Hilo) acknowledges your opposition to the proposed New Educational Telescope project.

As discussed in Sections 1.4.1 and 1.4.2 of the Draft EA, the Proposed Action would provide a facility for the following:

- To conduct scientific research projects,
- To train students in modern observational techniques applied in scientific research,
- To train students in modern telescope operations,
- To support developments in instrumentation and technical projects,
- To support outreach activities and student training in communicating science with the general public, and
- To serve as a bridge between professional astronomy activities on the Big Island and local communities.

The UH Hilo Physics and Astronomy programs provide a unique and excellent undergraduate education within the College of Natural Science and Health Sciences. All faculty have active research projects that provide opportunities for students to gain valuable experience through internships and directed-studies courses. The programs are designed to prepare students for a wide range of careers in physics and astronomy, from fundamental research to education and public outreach, from data science to engineering. Many career options are available without the need for graduate studies.



UH Hilo New Educational Telescope Facility  
Response to Pre-Assessment Consultation Comments

Page 2

August 29, 2022

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

DAVID Y. IGE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P. O. BOX 3378  
HONOLULU, HI 96801-3378

February 24, 2021

ELIZABETH A. CHAR, M.D.  
DIRECTOR OF HEALTH

In reply, please refer to:  
File:

Ms. Jennifer M. Scheffel  
SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, Hawaii 96720

**SSFM International, Inc.**  
**RECEIVED**

*3-4-2021*

Dear Ms. Scheffel:

Thank you for your submittal requesting comments to the Pre-Consultation for Draft Environmental Assessment of the University of Hawaii at Hilo New Educational Telescope Facility, Maunakea, Hamakua District, Island of Hawaii, Tax Map Key (3) 4-4-015:012.

Project activities shall comply with the following Administrative Rules of the Department of Health:

- Chapter 11-41 Lead-based Paint Activities
- Chapter 11-46 Community Noise Control
- Chapter 11-501 Asbestos Requirements
- Chapter 11-503 Fees for Asbestos Removal & Certification
- Chapter 11-504 Asbestos Abatement Certification Program

Should you have any questions, please contact me at (808) 586-4700.

Sincerely,

Daryn A. Yamada  
Acting Program Manager  
Indoor and Radiological Health Branch

## Solid and Hazardous Waste Branch Standard Comments

### Solid and Hazardous Waste Branch Standard Comments

November 26, 2018

The Solid and Hazardous Waste Branch administers programs in the areas of:

- 1) Management of hazardous waste;
- 2) Management of solid waste; and
- 3) Regulation of underground storage tanks.

Our general comments on projects are below. For further information about these programs, please contact the Solid and Hazardous Waste Branch at (808) 586-4226. All chapters of the Hawaii Revised Statutes (HRS) are at <https://www.capitol.hawaii.gov/hrscurrent/>.

#### Hazardous Waste Program

- The state regulations for hazardous waste and used oil are in chapters 11-260.1 to 11-279.1, Hawaii Administrative Rules (HAR) [<http://health.hawaii.gov/shwb/hwrules/>]. These rules apply to the identification, handling, transportation, storage and disposal of regulated hazardous waste and used oil. Generators, transporters and treatment, storage, and disposal facilities of hazardous waste and used oil must adhere to these requirements. Violations are subject to penalties under chapter 342J, HRS.

#### Solid Waste Section

- The Solid Waste Section (SWS) enforces laws and regulations contained in chapters 342H and 342I, HRS, and chapter 11-58.1, HAR, "Solid Waste Management Control", [<http://health.hawaii.gov/shwb/solid-waste/>].
- The purpose of the rules is to establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation and transfer systems.
- All facilities that accept solid wastes are required to obtain a solid waste management permit from the SWS. Examples of the types of facilities governed by these regulations include landfills, transfer stations and convenience centers, recycling facilities, composting facilities, and salvage facilities. Medical waste, infectious waste, and foreign waste treatment facilities are also included.
- Generators of solid waste are required to ensure that their wastes are properly delivered to permitted solid waste management facilities. Managers of construction and demolition projects should require their waste contractors to submit disposal receipts and invoices to ensure proper disposal of wastes.

For further information about these programs, please contact the Solid and Hazardous Waste Branch at (808) 586-4226.

### Solid and Hazardous Waste Branch Standard Comments

maximize waste diversion and minimize disposal. Such plans should include designated areas to promote the collection of reusable and recyclable materials.

- Solid waste management plans seek to maximize waste diversion and minimize disposal. Such plans should include designated areas to promote the collection of reusable and recyclable materials.

### Underground Storage Tank Program

- The state's underground storage tank (UST) regulations, found in chapter 11-280.1, HAR, [<http://health.hawaii.gov/shwb/underground-storage-tanks/>], include specific requirements that UST owners and operators must meet when installing, operating, and permanently closing their UST systems and addressing releases from USTs. Violations are subject to penalties under chapter 11-280.1, HAR, and chapter 342L, HRS.
- A permit is required prior to the installation and operation of a UST. Any new UST system that will be installed must have secondary containment with interstitial monitoring. Refer to subchapters 2, 3, 4, and 12 of chapter 11-280.1, HAR. The installation permit expires 1 year from the date of issuance. The operation permit expires 5 years from the date of issuance.
- §11-280.1-50, HAR, requires owners and operators of USTs or tank systems to notify DOH within twenty-four (24) hours and follow the procedures in § 11-280.1-52, HAR, if any of the following occur, with specific exceptions found in the rules:
  - 1) The discovery by any person of evidence of regulated substances which may have been released at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, or nearby surface water);
  - 2) Unusual UST system operating conditions observed or experienced (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST, or an unexplained presence of water in the tank); or
  - 3) Monitoring results from a release detection method required under §§11-280.1-41 or 11-280.1-42 indicate a release may have occurred.
- For release response actions, responsible parties and their consultants and contractors should follow the applicable guidance in the Department of Health Hazard Evaluation Emergency (HEER) Office Technical Guidance Manual, HEER Environmental Action Level (EAL) guidance, and other guidance documents on the DOH HEER Office website [<http://eha-web.doh.hawaii.gov/eha-cma/Org/HEER/>], including those pertaining to Multi-Increment Sampling of soil, low flow groundwater sampling, soil vapor sampling, and Environmental Hazard Evaluations (EHE)/Environmental Hazard Management Plans (EHMP).

For further information about these programs, please contact the Solid and Hazardous Waste Branch at (808) 586-4226.

3



August 29, 2022

SSFM 2020_037.000

State of Hawai'i  
Department of Health  
Indoor and Radiological Health Branch  
P.O. Box 3378  
Honolulu, HI 96801-3378

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

To whom it may concern,

Thank you for your department's response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA) submitted by the former Acting Program Manager, Daryn A. Yamada.

The proposed project will comply with the following Hawai'i Administrative Rules of the Department of Health, as applicable:

- Chapter 11-41 Lead-based Paint Activities
- Chapter 11-46 Community Noise Control
- Chapter 11-501 Asbestos Requirements
- Chapter 11-503 Fees for Asbestos Removal & Certification
- Chapter 11-504 Asbestos Abatement and Certification Program

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

**Jennifer Scheffel**

---

**From:** Bonnie Bee <recallbherenow@hotmail.com>  
**Sent:** Thursday, February 25, 2021 7:54 PM  
**To:** Jennifer Scheffel  
**Subject:** Maunakea

Email received from EXTERNAL sender. Confirm the content is safe prior to opening attachments or links.

PO Box 30848  
Anahola, Hawai'i 96703-0848

25 February 2021

SSFM International, Inc  
Attention: Jennifer M. Scheffel, Sr. Environmental Planner  
99 Aupuni Street – Suite 202  
Hilo, Hawai'i 96720

**RE Maunakea  
Pre-Assessment Consultation for Draft Environmental Assessment (dEA) for proposed  
New Educational Telescope Facility by University of Hawaii at Hilo (UH-H) TMK (3)4-4015:012**

To Whom it May Concern:

Aloha – We are against the proposal of UH-Hilo to construct a new educational telescope facility at Halepohaku on Maunakea. Furthermore, “Lawmakers want new management for Hawaii’s tallest mountain” by Audrey McAvoy, AP of *The Telegraph* (2/2/2021) the University of Hawaii management of Maunakea is thankfully being seriously altered at this time by Hawaii Legislature and there should be no action on Maunakea.

Maunakea most sacred / spiritual Wahi Pana – zenith of Hawaiian peoples’ ancestral lineage to creation.

The environmental review process ought to be stopped now and the funding immediately diverted to support the myriad tragic statistics concerning Hawaiian people which has a severe disparity vs. Hawaii’s population.

The 11th August 2002, as published in the *Honolulu Advertiser*, “ ... Native Hawaiians impoverished state in health, education, drug abuse, divorce, child abuse, suicide, alcoholism and incarceration ... ” – *that* – was twenty (20) years ago.

Statistics have become more dire. Mike Stobbe, AP Medical Writer reported in the *Star Advertiser* 20th July 2017: “ ... Native Hawaiians ... more likely to suffer asthma, diabetes and obesity. They also were more often under severe psychological stress ... ”.

*Mauitime*, on 2nd April 2018, Anthony Pignataro wrote: “ ... Let me reiterate: Native Hawaiians, the first people to live in Hawaii, currently “have the highest poverty rates for individuals and families” in Hawaii. This is a tragedy and a travesty that those of us in Hawaii who aren’t Native Hawaiian ignore at our peril”.

Hawaiian people unfortunately represent the worst in data: social, health, houselessness and top the charts in mortality rates for heart disease, ALL types of cancer, substance abuse, DV, CSA, obstructive lung disease, chronic kidney disease, metabolic syndrome – in short, prevalent data of the poor health of Hawaiian people’s can be traced to the continued disrespect of Hawaiian religion and cultural, traditional, customary practices.

The wanton destruction and desecration at Maunakea must cease and desist...

– Venerated integrity of sacred Maunakea – the requisite – upheld, UH-Hilo ought to seek new educational facilities for the betterment of Hawaiian peoples’  
– an Endangered Species – in crises.

Mahalo Loa – in making pololei (correct) decision; and keep us abreast via *USPS* mailing list for all updates please.

Sincerely With *ALOHA*,

Bonnie P. Bator and `Ohana (Keana`aina, Kai`aokamalie, Keli`ikoa & Kai)

C Pele Defense Fund (*PDF*)



August 29, 2022

SSFM 2020_037.000

Bonnie P. Bator and 'Ohana  
EMAIL: [recallbherenow@hotmail.com](mailto:recallbherenow@hotmail.com)

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Ms. Bator,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). The University of Hawai'i at Hilo (UH Hilo) recognizes your observations and acknowledges your opposition to the proposed New Educational Telescope project.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner



UNIVERSITY  
of HAWAII  
MĀNOA

Water Resources Research Center

March 2, 2021

To Whom It May Concern,

This is to acknowledge receipt of your letter requesting a review of an environmental assessment (EA) or environmental impact statement (EIS), see attached. The Environmental Center at the University of Hawai'i at Mānoa, which for a time was linked to the Water Resources Research Center (WRRC), has been discontinued. As a result of the closure of the Environmental Center, we regret that WRRC no longer has the capacity to review environmental documents.

Sincerely,

Thomas Giambelluca  
Director

Attachment

2540 Dole Street, Holmes Hall 283  
Honolulu, Hawai'i 96822  
Telephone: (808) 956-7847  
Fax: (808) 956-5044

An Equal Opportunity/Affirmative Action Institution



August 29, 2022

SSFM 2020_037.000

Mr. Thomas Giambelluca, Director  
University of Hawai'i Mānoa  
Water Resources Research Center  
2540 Dole Street, Holmes Hall 283  
Honolulu, HI 96822

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Giambelluca,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). SSFM acknowledges that the University of Hawai'i at Manoa Water Resources Research Center no longer has capacity to review environmental documents and will update the mailing list accordingly.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

99 Aupuni Street | Suite 202 | Hilo, Hawaii 96720 | Tel 808.933.2727 | Fax 855.329.7736 | [www.ssfm.com](http://www.ssfm.com)  
Planning | Project & Construction Management | Structural, Civil & Traffic Engineering



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pacific Islands Fish and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122  
Honolulu, Hawai'i 96850



In Reply Refer To:  
01EPIF00-2021-TA-0190

March 1, 2021

Ms. Jennifer Scheffel  
SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, Hawai'i 96720

Subject: Response to Request for Technical Assistance

Dear Ms. Scheffel:

Thank you for your recent correspondence requesting technical assistance on species biology, habitat, or life requisite requirements. The Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) appreciates your efforts to avoid or minimize effects to protected species associated with your proposed actions. We provide the following information for your consideration under the authorities of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq.*), as amended.

Due to significant workload constraints, PIFWO is currently unable to specifically address your information request. The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. Based on your project location and description, we have noted the species most likely to occur within the vicinity of the project area, in the '**Occurs In or Near Project Area**' column. Please note this list is not comprehensive and should only be used for general guidance. We have added to the PIFWO website, located at <https://www.fws.gov/pacificislands/promo.cfm?id=177175840> recommended conservation measures intended to avoid or minimize adverse effects to these federally protected species and best management practices to minimize and avoid sedimentation and erosion impacts to water quality. If your project occurs on the island of Hawai'i, we have also enclosed our biosecurity protocol for activities in or near natural areas.

If you are representing a federal action agency, please request an official species list following the instructions at our PIFWO website <https://www.fws.gov/pacificislands/articles.cfm?id=149489558>. You can find out if your project occurs in or near designated critical habitat here: <https://ecos.fws.gov/ipac/>.

**INTERIOR REGION 9  
COLUMBIA-PACIFIC NORTHWEST**

IDAHO, MONTANA*, OREGON*, WASHINGTON  
*PARTIAL

**INTERIOR REGION 12  
PACIFIC ISLANDS**

AMERICAN SAMOA, GUAM, HAWAII*,  
NORTHERN MARIANA ISLANDS

Ms. Jennifer Scheffel

2

Under section 7 of the ESA, it is the Federal agency's (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a "may affect, likely to adversely affect" determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have "no effect" on federally listed species and/or critical habitat do not require additional coordination or consultation.

Implementing the avoidance, minimization, or conservation measures for the species that may occur in your project area will normally enable you to make a "may affect, not likely to adversely affect" determination for your project. If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. We regret that we cannot provide you with more specific protected species information for your project site. If you have questions that are not answered by the information on our website, you can contact PIFWO at (808) 792-9400 and ask to speak to the lead biologist for the island where your project is located.

Sincerely,

Island Team Manager  
Pacific Islands Fish and Wildlife Office

Enclosures (3)

The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. For your guidance we marked species that may occur in the vicinity of your project, this list is not comprehensive and should only be used for general guidance. We have also attached our biosecurity protocol for projects in or near natural areas.

#### Enclosure 1. Federal Status of Animal Species

<u>Scientific Name</u>	<u>Common Name / Hawaiian Name</u>	<u>Federal Status</u>	<u>May Occur In Project Area</u>
<b>Mammals</b>			
<i>Lasiurus cinereus semotus</i>	Hawaiian hoary bat/'ōpe'ape'a	E	<input checked="" type="checkbox"/>
<b>Reptiles</b>			
<i>Chelonia mydas</i>	green sea turtle/honu - Central North Pacific distinct population segment (DPS)	T	<input type="checkbox"/>
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle/honu 'ea	E	<input type="checkbox"/>
<b>Birds</b>			
<i>Anas wyvilliana</i>	Hawaiian duck/koloa	E	<input type="checkbox"/>
<i>Branta sandvicensis</i>	Hawaiian goose/nēnē	T	<input checked="" type="checkbox"/>
<i>Fulica alai</i>	Hawaiian coot/'alae kea	E	<input type="checkbox"/>
<i>Gallinula galeata sandvicensis</i>	Hawaiian gallinule/'alae 'ula	E	<input type="checkbox"/>
<i>Himantopus mexicanus knudseni</i>	Hawaiian stilt/ae'o	E	<input type="checkbox"/>
<i>Oceanodroma castro</i>	band-rumped storm-petrel Hawai'i DPS/'akē'akē	E	<input checked="" type="checkbox"/>
<i>Pterodroma sandwichensis</i>	Hawaiian petrel/'ua'u	E	<input checked="" type="checkbox"/>
<i>Puffinus auricularis newelli</i>	Newell's shearwater/'a'o	T	<input checked="" type="checkbox"/>
<i>Ardenna pacificus</i>	wedge-tailed shearwater/'ua'u kani	MBTA	<input type="checkbox"/>
<i>Buteo solitarius</i>	Hawaiian hawk/'io	MBTA	<input checked="" type="checkbox"/>
<i>Gygis alba</i>	white tern/manu-o-kū	MBTA	<input type="checkbox"/>
<b>Insects</b>			
<i>Manduca blackburni</i>	Blackburn's sphinx moth	E	<input type="checkbox"/>
<i>Megalagrion pacificum</i>	Pacific Hawaiian damselfly	E	<input type="checkbox"/>
<i>Megalagrion xanthomelas</i>	orangeblack Hawaiian Damselfly	E	<input type="checkbox"/>
<i>Megalagrion nigrohamatum nigrolineatum</i>	blackline Hawaiian damselfly	E	<input type="checkbox"/>

#### Enclosure 2. Federal Status of Plant Species

<u>Plants</u>	<u>Scientific Name</u>	<u>Common Name or Hawaiian Name</u>	<u>Federal Status</u>	<u>Locations</u>	<u>May Occur In Project Area</u>
	<i>Argyroxiphium sandwicense</i> ssp. <i>sandwicense</i>	'Ahinahina	E	M, H	<input checked="" type="checkbox"/>
	<i>Bonamia menziesii</i>	no common name	E	K, O, L, M, H	<input type="checkbox"/>
	<i>Canavalia pubescens</i>	'āwīwīwī	E	Ni, K, L, M	<input type="checkbox"/>
	<i>Colubrina oppositifolia</i>	kauila	E	O, M, H	<input type="checkbox"/>
	<i>Cyperus trachysanthos</i>	Pu'uka'a	E	K, O	<input type="checkbox"/>
	<i>Gouania hillebrandii</i>	no common name	E	Mo, M	<input type="checkbox"/>
	<i>Hibiscus brackenridgei</i>	ma'o hau hele	E	O, Mo, L, M, H	<input type="checkbox"/>
	<i>Ischaemum byrone</i>	Hilo ischaemum	E	K, O, Mo, M, H	<input type="checkbox"/>
	<i>Isodendron pyriform</i>	wahine noho kula	E	O, H	<input type="checkbox"/>
	<i>Marsilea villosa</i>	'ihi' ihi	E	Ni, O, Mo	<input type="checkbox"/>
	<i>Mezoneuron kavaiense</i>	uhuhi	E	O, H	<input type="checkbox"/>
	<i>Nothoecstrum breviflorum</i>	'aiea	E	H	<input type="checkbox"/>
	<i>Panicum fauriei</i> var. <i>carteri</i>	Carter's panicgrass	E	Molokini Islet (O), Mo	<input type="checkbox"/>
	<i>Panicum niuhauense</i>	lau'ehu	E	K	<input type="checkbox"/>
	<i>Peucedanum sandwicense</i>	makou	E	K, O, Mo, M	<input type="checkbox"/>
	<i>Pleomele (Chrysodracon) hawaiiensis</i>	halapepe	E	H	<input type="checkbox"/>
	<i>Portulaca sclerocarpa</i>	'ihi	E	L, H	<input type="checkbox"/>
	<i>Portulaca villosa</i>	'ihi	E	Le, Ka, Ni, O, Mo, M, L, H, Nihoa	<input type="checkbox"/>
	<i>Pritchardia affinis (maideniana)</i>	loulu	E	H	<input type="checkbox"/>
	<i>Pseudognaphalium sandwicense</i> var. <i>molokaiense</i>	'ena'ena	E	Mo, M	<input type="checkbox"/>
	<i>Scaevola coriacea</i>	dwarf naupaka	E	Mo, M	<input type="checkbox"/>
	<i>Schenkia (Centaurium) sebaeoides</i>	'āwīwī	E	K, O, Mo, L, M	<input type="checkbox"/>
	<i>Sesbania tomentosa</i>	'ōhai	E	Ni, Ka, K, O, Mo, M, L, H, Necker, Nihoa	<input type="checkbox"/>
	<i>Tetramolopium rockii</i>	no common name	T	Mo	<input type="checkbox"/>
	<i>Vigna o-wahuensis</i>	no common name	E	Mo, M, L, H, Ka	<input type="checkbox"/>

Location key: O=O'ahu, K=Kaua'i, M=Maui, H=Hawai'i Island, L=Lāna'i, Mo=Moloka'i, Ka=Kaho'olawe, Ni=Ni'ihau, Le=Lehua

### Enclosure 3. BIOSECURITY PROTOCOL – HAWAI‘I ISLAND

The following biosecurity protocol (based on National Park Service, State of Hawai‘i, U.S. Fish and Wildlife, U.S. Geological Survey, and the DOI Office of Native Hawaiian Relations guidance) should be followed when operating on the island of Hawai‘i to prevent the introduction of harmful invasive species including frogs, ants, weeds, and fungi into local natural areas (e.g., Hawai‘i Volcanoes National Park, Hakalau Forest National Wildlife Refuge, State of Hawai‘i “Natural Areas”) and areas with native habitat (habitat that is primarily composed of native vegetation), other islands in Hawaiian archipelago, or the U.S. mainland. The protocol also includes suggestions for keeping field staff safe from certain invasive species.

#### 1. All work vehicles, machinery, and equipment should be cleaned, inspected by its user, and found free of mud, dirt, debris and invasive species prior to entry into the natural areas or native habitat.

- a. Vehicles, machinery, and equipment must be thoroughly pressure washed in a designated cleaning area and visibly free of mud, dirt, plant debris, insects, frogs (including frog eggs) and other vertebrate species such as rats, mice and non-vegetative debris. A hot water wash is preferred. Areas of particular concern include bumpers, grills, hood compartments, areas under the battery, wheel wells, undercarriage, cabs, and truck beds (truck beds with accumulated material (intentionally placed or fallen from trees) are prime sites for hitchhikers).
- b. The interior and exterior of vehicles, machinery, and equipment must be free of rubbish and food. The interiors of vehicles and the cabs of machinery must be vacuumed clean. Floor mats shall be sanitized with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
- c. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter natural areas or native habitat. Treatment is the responsibility of the equipment or vehicle owner and operator.

#### 2. Little Fire Ants – All work vehicles, machinery, and equipment should be inspected for invasive ants prior to entering the natural areas or native habitat.

- a. A visual inspection for little fire ants should be conducted prior to entry into natural areas or native habitat.
- b. Hygiene is paramount but even the cleanest vehicle can pick up a little fire ant. Place MaxForce Complete Brand Granular Insect Bait (1.0% hydramethylnon) into refillable tamper resistant bait stations. An example of a commercially available refillable tamper resistant bait station is the Ant Café Pro (<https://www.antcafe.com/>). Place a bait station (or stations) in vehicle. Note larger vehicles, such as trucks, may require multiple stations. Monitor bait stations frequently (every week at a minimum) and replace bait as needed. If the station does not have a sticker to identify the contents, apply a sticker listing contents to the station.

- c. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter natural areas or native habitat until it is sanitized and re-tested following a resting period. Infested vehicles must be sanitized following recommendations by the Hawai‘i Ant Lab (<http://www.littlefireants.com/>) or other ant control expert and in accordance with all State and Federal laws. Treatment is the responsibility of the equipment or vehicle owner.
- d. Gravel, building materials, or other equipment such as portable buildings should be baited using MaxForce Complete Brand Granular Insect Bait (1.0% hydramethylnon) or AmdroPro (0.73% hydramethylnon) following label guidance.
- e. Storage areas that hold field tools, especially tents, tarps, and clothing should be baited using MaxForce Complete Brand Granular Insect Bait (1.0% hydramethylnon) or AmdroPro (0.73% hydramethylnon) following label guidance.

#### 3. Base yards and staging areas inside and outside project sites must be kept free of invasive species.

- a. Base yards and staging areas should be inspected at least weekly for invasive species and any found invasive removed immediately. Pay particular attention to where vehicles are parked overnight, keeping areas within 10-meters of vehicles free of debris. Parking on pavement and not under trees, while not always practical is best.
- b. Project vehicles or equipment stored outside of a base yard or staging area, such as a private residence, should be kept in a pest free area.

#### 4. All cutting tools must be sanitized to prevent the Rapid ‘Ōhi‘a Death (ROD) disease.

- a. Avoid wounding ‘ōhi‘a trees and roots with mowers, chainsaws, weed eaters, and other tools. Cut only the minimal number of trees and branches as approved for the project.
- b. All cutting tools, including machetes, chainsaws, and loppers must be sanitized to remove visible dirt and other contaminants prior to entry into natural areas or areas with native habitat, and when moving to a new project area within the native habitat area. Tools may be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution. One minute after sanitizing, you may apply an oil-based lubricant to chainsaw chains or other metallic parts to prevent corrosion.
- c. Only dedicated tools and chainsaws should be used to sample known or suspected ROD infected trees.
- d. Vehicles, machinery, and equipment must be cleaned as described in (1) above.

5. **Imported firewood, logs, and 'ōhi'a parts:**

- a. 'Ōhi'a firewood, 'ōhi'a logs, and 'ōhi'a parts should not be transported.

6. **For individuals working in the field:**

- a. Before going into the field, visually inspect and clean your clothes, boots, pack, radio harness, tools and other personal gear and equipment, for seeds, soil, plant parts, insects, and other debris. A small brush is handy for cleaning boots, equipment and gear. Soles of shoes should be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
- b. Immediately before leaving the field, visually inspect and clean your clothes, boots, pack, radio harness, tools, and other personnel gear and equipment, for seeds, soil, plant parts, insects, and other debris. Soles of shoes should be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
- c. Little fire ants' nest in trees. If you are under a tree and that tree is bumped or somehow stressed, the threat response of the ants is to fall from the leaves and sting the person under the tree. If you are subject to an ant attack, do not panic. The ants are extremely small, but their stings are painful so make sure you remove all ants from your body and clothing. The stings cause inch long welts that are itchy and painful and can last for weeks. Treat stings as you would other insect stings. In some persons stings can produce life threatening reactions. Stocking antihistamine in the first aid kit is a reasonable precaution.
- d. Rat Lungworm disease is caused by a parasite that can infect humans who consume raw or undercooked infected snails or slugs or consume raw produce that contains a small infected snail or slug. Infection is rare but can be serious. Symptoms can include severe headache, neck stiffness, low grade fever, nausea, and vomiting anywhere from 1 to 6 weeks after exposure. The disease is not spread person to person. Anyone who handles snails or slugs should wear gloves and/or wash hands. Eating unwashed produce is discouraged.



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pacific Islands Fish and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122  
Honolulu, Hawai'i 96850



In Reply Refer To:  
01EPIF00-2021-TA-0190

March 1, 2021

Ms. Jennifer Scheffel  
SSFM International, Inc.  
99 Aupuni Street, Suite 202  
Hilo, Hawai'i 96720

Subject: Response to Request for Technical Assistance

Dear Ms. Scheffel:

Thank you for your recent correspondence requesting technical assistance on species biology, habitat, or life requisite requirements. The Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) appreciates your efforts to avoid or minimize effects to protected species associated with your proposed actions. We provide the following information for your consideration under the authorities of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq.*), as amended.

Due to significant workload constraints, PIFWO is currently unable to specifically address your information request. The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. Based on your project location and description, we have noted the species most likely to occur within the vicinity of the project area, in the '**Occurs In or Near Project Area**' column. Please note this list is not comprehensive and should only be used for general guidance. We have added to the PIFWO website, located at <https://www.fws.gov/pacificislands/promo.cfm?id=177175840> recommended conservation measures intended to avoid or minimize adverse effects to these federally protected species and best management practices to minimize and avoid sedimentation and erosion impacts to water quality. If your project occurs on the island of Hawai'i, we have also enclosed our biosecurity protocol for activities in or near natural areas.

If you are representing a federal action agency, please request an official species list following the instructions at our PIFWO website <https://www.fws.gov/pacificislands/articles.cfm?id=149489558>. You can find out if your project occurs in or near designated critical habitat here: <https://ecos.fws.gov/ipac/>.

INTERIOR REGION 9 COLUMBIA–  
PACIFIC NORTHWEST  
Idaho, Montana*, Oregon*, Washington  
*PARTIAL

INTERIOR REGION 12  
Pacific Islands  
American Samoa, Guam, Hawai'i,  
Northern Mariana Islands

Under section 7 of the ESA, it is the Federal agency's (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a "may affect, likely to adversely affect" determination is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have "no effect" on federally listed species and/or critical habitat do not require additional coordination or consultation.

Implementing the avoidance, minimization, or conservation measures for the species that may occur in your project area will normally enable you to make a "may affect, not likely to adversely affect" determination for your project. If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with the ESA compliance. If the proposed project is funded, authorized, or permitted by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no Federal agency is involved with the proposed project, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. A section 10 permit application must include a habitat conservation plan that identifies the effects of the action on listed species and their habitats and defines measures to minimize and mitigate those adverse effects.

We appreciate your efforts to conserve endangered species. We regret that we cannot provide you with more specific protected species information for your project site. If you have questions that are not answered by the information on our website, you can contact PIFWO at (808) 792-9400 and ask to speak to the lead biologist for the island where your project is located.

Sincerely,

**Aaron  
Nadig**

Island Team Manager  
Pacific Islands Fish and Wildlife Office

Digitally signed by  
Aaron Nadig  
Date: 2021.03.02  
08:16:15 -10'00'

Enclosures (3)

The table below lists the protected species most likely to be encountered by projects implemented within the Hawaiian Islands. For your guidance we marked species that may occur in the vicinity of your project, this list is not comprehensive and should only be used for general guidance. We have also attached our biosecurity protocol for projects in or near natural areas.

**Enclosure 1. Federal Status of Animal Species**

<u>Scientific Name</u>	<u>Common Name / Hawaiian Name</u>	<u>Federal Status</u>	<u>May Occur In Project Area</u>
<b>Mammals</b>			
<i>Lasiurus cinereus semotus</i>	Hawaiian hoary bat/'ōpe'ape'a	E	<input checked="" type="checkbox"/>
<b>Reptiles</b>			
<i>Chelonia mydas</i>	green sea turtle/honu - Central North Pacific distinct population segment (DPS)	T	<input type="checkbox"/>
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle/honu 'ea	E	<input type="checkbox"/>
<b>Birds</b>			
<i>Anas wyvilliana</i>	Hawaiian duck/koloa	E	<input type="checkbox"/>
<i>Branta sandvicensis</i>	Hawaiian goose/nēnē	T	<input checked="" type="checkbox"/>
<i>Fulica alai</i>	Hawaiian coot/'alae kea	E	<input type="checkbox"/>
<i>Gallinula galeata sandvicensis</i>	Hawaiian gallinule/'alae 'ula	E	<input type="checkbox"/>
<i>Himantopus mexicanus knudseni</i>	Hawaiian stilt/ae'o	E	<input type="checkbox"/>
<i>Oceanodroma castro</i>	band-rumped storm-petrel Hawai'i DPS/'akē'akē	E	<input checked="" type="checkbox"/>
<i>Pterodroma sandwichensis</i>	Hawaiian petrel/'ua'u	E	<input checked="" type="checkbox"/>
<i>Puffinus auricularis newelli</i>	Newell's shearwater/'a'o	T	<input checked="" type="checkbox"/>
<i>Ardenna pacificus</i>	wedge-tailed shearwater/'ua'u kani	MBTA	<input type="checkbox"/>
<i>Buteo solitarius</i>	Hawaiian hawk/'io	MBTA	<input checked="" type="checkbox"/>
<i>Gygis alba</i>	white tern/manu-o-kū	MBTA	<input type="checkbox"/>
<b>Insects</b>			
<i>Manduca blackburni</i>	Blackburn's sphinx moth	E	<input type="checkbox"/>
<i>Megalagrion pacificum</i>	Pacific Hawaiian damselfly	E	<input type="checkbox"/>
<i>Megalagrion xanthomelas</i>	orangeblack Hawaiian Damselfly	E	<input type="checkbox"/>
<i>Megalagrion nigrohamatum nigrolineatum</i>	blackline Hawaiian damselfly	E	<input type="checkbox"/>

**Enclosure 2. Federal Status of Plant Species**

<b>Plants</b>				
<b>Scientific Name</b>	<b>Common Name or Hawaiian Name</b>	<b>Federal Status</b>	<b>Locations</b>	<b>May Occur In Project Area</b>
<i>Argyroxiphium sandwicense</i> ssp. <i>sandwicense</i>	`Ahinahina	E	M, H	<input checked="" type="checkbox"/>
<i>Bonamia menziesii</i>	no common name	E	K, O, L, M, H	<input type="checkbox"/>
<i>Canavalia pubescens</i>	`āwikiwiki	E	Ni, K, L, M	<input type="checkbox"/>
<i>Colubrina oppositifolia</i>	kauila	E	O, M, H	<input type="checkbox"/>
<i>Cyperus trachysanthos</i>	Pu`uka`a	E	K, O	<input type="checkbox"/>
<i>Gouania hillebrandii</i>	no common name	E	Mo, M	<input type="checkbox"/>
<i>Hibiscus brackenridgei</i>	ma`o hau hele	E	O, Mo, L, M, H	<input type="checkbox"/>
<i>Ischaemum byrone</i>	Hilo ischaemum	E	K, O, Mo, M, H	<input type="checkbox"/>
<i>Isodendron pyriformium</i>	wahine noho kula	E	O, H	<input type="checkbox"/>
<i>Marsilea villosa</i>	`ihi`ihi	E	Ni, O, Mo	<input type="checkbox"/>
<i>Mezoneuron kavaiense</i>	uhiuhi	E	O, H	<input type="checkbox"/>
<i>Nothoestrum breviflorum</i>	`aiea	E	H	<input type="checkbox"/>
<i>Panicum fauriei</i> var. <i>carteri</i>	Carter`s panicgrass	E	Molokini Islet (O), Mo	<input type="checkbox"/>
<i>Panicum niuhauense</i>	lau`ehu	E	K	<input type="checkbox"/>
<i>Peucedanum sandwicense</i>	makou	E	K, O, Mo, M	<input type="checkbox"/>
<i>Pleomele (Chrysodracon) hawaiiensis</i>	halapepe	E	H	<input type="checkbox"/>
<i>Portulaca sclerocarpa</i>	`ihi	E	L, H	<input type="checkbox"/>
<i>Portulaca villosa</i>	`ihi	E	Le, Ka, Ni, O, Mo, M, L, H, Nihoa	<input type="checkbox"/>
<i>Pritchardia affinis (maideniana)</i>	loulu	E	H	<input type="checkbox"/>
<i>Pseudognaphalium sandwicensium</i> var. <i>molokaiense</i>	`ena`ena	E	Mo, M	<input type="checkbox"/>
<i>Scaevola coriacea</i>	dwarf naupaka	E	Mo, M	<input type="checkbox"/>
<i>Schenkia (Centaurium) sebaeoides</i>	`āwiwi	E	K, O, Mo, L, M	<input type="checkbox"/>
<i>Sesbania tomentosa</i>	`ōhai	E	Ni, Ka, K, O, Mo, M, L, H, Necker, Nihoa	<input type="checkbox"/>
<i>Tetramolopium rockii</i>	no common name	T	Mo	<input type="checkbox"/>
<i>Vigna o-wahuensis</i>	no common name	E	Mo, M, L, H, Ka	<input type="checkbox"/>

Location key: O=O`ahu, K=Kaua`i, M=Maui, H=Hawai`i Island, L=Lāna`i, Mo=Moloka`i, Ka=Kaho`olawe, Ni=Ni`ihau, Le=Lehua

**Enclosure 3. BIOSECURITY PROTOCOL – HAWAI`I ISLAND**

The following biosecurity protocol (based on National Park Service, State of Hawai`i, U.S. Fish and Wildlife, U.S. Geological Survey, and the DOI Office of Native Hawaiian Relations guidance) should be followed when operating on the island of Hawai`i to prevent the introduction of harmful invasive species including frogs, ants, weeds, and fungi into local natural areas (e.g., Hawai`i Volcanoes National Park, Hakalau Forest National Wildlife Refuge, State of Hawai`i “Natural Areas”) and areas with native habitat (habitat that is primarily composed of native vegetation), other islands in Hawaiian archipelago, or the U.S. mainland. The protocol also includes suggestions for keeping field staff safe from certain invasive species.

- 1. All work vehicles, machinery, and equipment should be cleaned, inspected by its user, and found free of mud, dirt, debris and invasive species prior to entry into the natural areas or native habitat.**
  - a. Vehicles, machinery, and equipment must be thoroughly pressure washed in a designated cleaning area and visibly free of mud, dirt, plant debris, insects, frogs (including frog eggs) and other vertebrate species such as rats, mice and non-vegetative debris. A hot water wash is preferred. Areas of particular concern include bumpers, grills, hood compartments, areas under the battery, wheel wells, undercarriage, cabs, and truck beds (truck beds with accumulated material (intentionally placed or fallen from trees) are prime sites for hitchhikers).
  - b. The interior and exterior of vehicles, machinery, and equipment must be free of rubbish and food. The interiors of vehicles and the cabs of machinery must be vacuumed clean. Floor mats shall be sanitized with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
  - c. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter natural areas or native habitat. Treatment is the responsibility of the equipment or vehicle owner and operator.
- 2. Little Fire Ants – All work vehicles, machinery, and equipment should be inspected for invasive ants prior to entering the natural areas or native habitat.**
  - a. A visual inspection for little fire ants should be conducted prior to entry into natural areas or native habitat.
  - b. Hygiene is paramount but even the cleanest vehicle can pick up a little fire ant. Place MaxForce Complete Brand Granular Insect Bait (1.0% hydramethylnon) into refillable tamper resistant bait stations. An example of a commercially available refillable tamper resistant bait station is the Ant Café Pro (<https://www.antcafe.com/>). Place a bait station (or stations) in vehicle. Note larger vehicles, such as trucks, may require multiple stations. Monitor bait stations frequently (every week at a minimum) and replace bait as needed. If the station does not have a sticker to identify the contents, apply a sticker listing contents to the station.

- c. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter natural areas or native habitat until it is sanitized and re-tested following a resting period. Infested vehicles must be sanitized following recommendations by the Hawai'i Ant Lab (<http://www.littlefireants.com/>) or other ant control expert and in accordance with all State and Federal laws. Treatment is the responsibility of the equipment or vehicle owner.
- d. Gravel, building materials, or other equipment such as portable buildings should be baited using MaxForce Complete Brand Granular Insect Bait (1.0% hydramethylnon) or AmdroPro (0.73% hydramethylnon) following label guidance.
- e. Storage areas that hold field tools, especially tents, tarps, and clothing should be baited using MaxForce Complete Brand Granular Insect Bait (1.0% hydramethylnon) or AmdroPro (0.73% hydramethylnon) following label guidance.

**3. Base yards and staging areas inside and outside project sites must be kept free of invasive species.**

- a. Base yards and staging areas should be inspected at least weekly for invasive species and any found invasive removed immediately. Pay particular attention to where vehicles are parked overnight, keeping areas within 10-meters of vehicles free of debris. Parking on pavement and not under trees, while not always practical is best.
- b. Project vehicles or equipment stored outside of a base yard or staging area, such as a private residence, should be kept in a pest free area.

**4. All cutting tools must be sanitized to prevent the Rapid 'Ōhi'a Death (ROD) disease.**

- a. Avoid wounding 'ōhi'a trees and roots with mowers, chainsaws, weed eaters, and other tools. Cut only the minimal number of trees and branches as approved for the project.
- b. All cutting tools, including machetes, chainsaws, and loppers must be sanitized to remove visible dirt and other contaminants prior to entry into natural areas or areas with native habitat, and when moving to a new project area within the native habitat area. Tools may be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution. One minute after sanitizing, you may apply an oil-based lubricant to chainsaw chains or other metallic parts to prevent corrosion.
- c. Only dedicated tools and chainsaws should be used to sample known or suspected ROD infected trees.
- d. Vehicles, machinery, and equipment must be cleaned as described in (1) above.

**5. Imported firewood, logs, and 'ōhi'a parts:**

- a. 'Ōhi'a firewood, 'ōhi'a logs, and 'ōhi'a parts should not be transported.

**6. For individuals working in the field:**

- a. Before going into the field, visually inspect and clean your clothes, boots, pack, radio harness, tools and other personal gear and equipment, for seeds, soil, plant parts, insects, and other debris. A small brush is handy for cleaning boots, equipment and gear. Soles of shoes should be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
- b. Immediately before leaving the field, visually inspect and clean your clothes, boots, pack, radio harness, tools, and other personnel gear and equipment, for seeds, soil, plant parts, insects, and other debris. Soles of shoes should be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
- c. Little fire ants' nest in trees. If you are under a tree and that tree is bumped or somehow stressed, the threat response of the ants is to fall from the leaves and sting the person under the tree. If you are subject to an ant attack, do not panic. The ants are extremely small, but their stings are painful so make sure you remove all ants from your body and clothing. The stings cause inch long welts that are itchy and painful and can last for weeks. Treat stings as you would other insect stings. In some persons stings can produce life threatening reactions. Stocking antihistamine in the first aid kit is a reasonable precaution.
- d. Rat Lungworm disease is caused by a parasite that can infect humans who consume raw or undercooked infected snails or slugs or consume raw produce that contains a small infected snail or slug. Infection is rare but can be serious. Symptoms can include severe headache, neck stiffness, low grade fever, nausea, and vomiting anywhere from 1 to 6 weeks after exposure. The disease is not spread person to person. Anyone who handles snails or slugs should wear gloves and/or wash hands. Eating unwashed produce is discouraged.



August 29, 2022

SSFM 2020_037.000

Mr. Aaron Nadig, Island Team Manager  
U.S. Fish and Wildlife Service  
Pacific Islands Fish and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122  
Honolulu, HI 96850

**SUBJECT: University of Hawai'i at Hilo New Educational Telescope Facility  
Maunakea, Hāmākua District, Island of Hawai'i  
Tax Map Key (TMK): (3) 4-4-015:012  
Response to Pre-Assessment Consultation Comments**

Dear Mr. Nadig,

Thank you for your response to the pre-assessment consultation letter for the Draft Environmental Assessment (EA). Section 3.3 of the Draft EA includes a review of protected species likely to occur within the vicinity of the project area and identifies measures to minimize potential impacts.

Your letter, along with this response letter, will be included in the forthcoming Draft EA. SSFM and UH Hilo appreciate your participation in the pre-assessment consultation process. Should you have additional comments or questions regarding the proposed project, please contact me at (808) 356-1273 or via email at [jscheffel@ssfm.com](mailto:jscheffel@ssfm.com).

SSFM INTERNATIONAL, INC.

Jennifer M. Scheffel  
Sr. Environmental Planner

*This page intentionally left blank.*

# Appendix F

---

New Educational Telescope Community Outreach Final Report

*This page intentionally left blank.*



UNIVERSITY  
of HAWAII  
**HILO**

# **NEW EDUCATIONAL TELESCOPE COMMUNITY OUTREACH**

## Final Report

---

Prepared by:

**SSFM**  
International

rev. January 2021

Page intentionally left blank

# TABLE OF CONTENTS

## Table of Contents

- I. Introduction.....2
- II. Virtual Open House .....5
- III. Informational and Promotional Material .....10
- IV. Stakeholder Meetings .....13
- V. Analysis of Results .....16
- VI. Appendices .....23
  - 1. Informational materials created for Virtual Outreach Efforts
  - 2. Stakeholder list
  - 3. Full Website Analytics Report
  - 4. Full Comments Matrix

## Table of Figures

- Figure 1: Conceptual rendering of the new educational telescope facility at the preferred site at the Halepōhaku mid-level facilities. .... 2
- Figure 2: Screenshot taken of the virtual open house webpage. .... 5
- Figure 3: Slide from the project introduction presentation..... 6
- Figure 4: Google map with 16 site alternatives evaluated. .... 7
- Figure 5: Virtual Open House Engagement Summary..... 8
- Figure 6: Location of Virtual Open House website users ..... 9
- Figure 7: Location of Open House Website Commenters..... 9
- Figure 8: Hawaii News Now story, 9/29/2020. .... 10
- Figure 9: Screenshot from UH News Facebook Video. .... 10
- Figure 10: Summary Table of Press Coverage..... 12
- Figure 11: Percentage of Comments in Support, Opposition, or Neutral..... 16
- Figure 12: Open House Comments Over Time..... 17
- Figure 13: Word Cloud of Supportive Comments Based on Word Frequency ..... 18
- Figure 14: Word Cloud of Opposing Comments Based on Word Frequency..... 20

# INTRODUCTION

## Project Background

The University of Hawai'i at Hilo's (UH Hilo) current observatory site on the summit of Maunakea, named Hōkū Ke'a, is targeted for decommissioning by 2023. The UH Hilo Department of Physics and Astronomy needs a state-of-the-art educational telescope for training students and for communicating science to the general public. Between 2016 and 2018, UH Hilo evaluated 16 site alternatives before selecting Halepōhaku as the best location for the new educational telescope facility. The selected site within Halepōhaku provides desirable observatory conditions and is currently used for equipment storage.

The current observatory summit site was developed in the 1960s for use by NASA and the U.S. Air Force. The University of Hawai'i acquired the telescope in 1970. In 2003, the University of Hawai'i gave control of the telescope to UH Hilo's Department of Physics and Astronomy to train undergraduates on the instrument. In 2010, the old 24-inch telescope was replaced by a 36-inch telescope and renamed Hōkū Ke'a. Although the Hōkū Ke'a telescope was intended to play a critical role in the educational mission of UH Hilo's Department of Physics and Astronomy, it did not achieve satisfactory operational performance and UH Hilo opted to replace the faulty telescope with a smaller, more modern telescope in 2013. A new 28-inch telescope, 18-foot dome enclosure, and related instrumentation were financed by the State of Hawai'i through Capital Improvement Project (CIP) funding and delivered to UH Hilo in 2016. Prior to the delivery of the new educational telescope components, however, the University of Hawai'i Board of Regents decided to decommission the Hōkū Ke'a observatory in an effort to comply with Governor Ige's 10-point plan for the improved management of Maunakea, which included decommissioning at least three of the 13 telescopes currently on the summit. As such, UH Hilo's new educational telescope has not yet been installed for use. With the decommissioning of Hōkū Ke'a now underway, UH Hilo aspires to install a new educational telescope at the selected site within Halepōhaku.



Figure 1: Conceptual rendering of the new educational telescope facility at the preferred site at the Halepōhaku mid-level facilities.

As one of the early steps in the project, UH Hilo initiated a public outreach campaign in the months of September and October 2020 at the request of the UH Board of Regents for additional community outreach prior to moving ahead with further plans. This early outreach was aimed at informing and educating the public about the new educational telescope and the University’s desire to install it at Halepōhaku. Comments were received through an online open house website and documented at the end the outreach process. The Board of Maunakea Management also expressed interest in the outreach efforts and received a presentation on the final results during the Board’s regular meeting on January 12, 2021. The community outreach objectives, activities and results from these initial outreach efforts are detailed in this report.

## Approach and Objectives

The primary **goal** of the outreach effort was to communicate the new telescope’s educational and community uses, purpose, size, location, and components to the public, and collect input. In this time of COVID-19 social distancing, face-to-face engagement with stakeholders and the community was not considered for public health concerns. Instead, this has prompted for the use of virtual engagement alternatives to replace traditional community engagement methods. Consequently, the public outreach for this effort consisted of 100% virtual engagement tools.

Outreach efforts involved developing a public “open house” webpage containing project information, graphics, and visual renderings to illustrate the location and scale of the project’s components in relation to the project site, such as the dome height and width, telescope size, and overall project footprint. Additional outreach efforts included conducting virtual stakeholder meetings with individuals and representatives from community groups. A total of 117 individuals were invited to participate in one of three virtual meetings held during the one-month open comment period ending on October 26, 2020.

The virtual engagement process was aimed at achieving the following **objectives** related to UH Hilo’s proposed Educational Telescope at Halepōhaku in Mauna Kea State Park:

1. **Communicate** the new telescope’s educational and community uses, purpose, size, location, and installment requirements;
2. **Share** visuals illustrating the scale and scope of the project’s elements (dome height, telescope size, overall project footprint);
3. **Inform** the community about the project site (e.g., previous and current uses of the project site), and internal mission and process/decision making that went into the site selection.
4. **Document** community concerns, and ideas regarding the construction and use of the educational telescope and gather meaningful input that may help to inform the planning and Environmental Assessment processes.

## Community Engagement Activities

The UH-Hilo Board of Regents expressed their desire for more community outreach around UHH's proposed new educational telescope at Halepōhaku prior to planning and environmental review activities proceeding. The project team developed a community outreach plan that aimed to build trust, cultivate relationships, and provide transparent communication to educate the community about where the telescope will be located, how it will be used and the anticipated educational and community benefits. The outreach activities consisted of the following:

1. **Virtual Open House** – A virtual open house website was developed and launch for a 30-day open period during which the public was invited to visit the website to learn more about the new educational telescope, the proposed site, and leave comments.
2. **Informational and Promotional Material** – The project team developed informational material to be used and shared publicly via the open house website, through direct emails and press releases, and at stakeholder meetings.
3. **Stakeholder Meeting** – Stakeholders from community organizations, civic clubs, educational institutes, and other relevant organizations were invited to attend a virtual meeting to learn about the project. These stakeholders were invited to attend one of three targeted virtual stakeholder meetings which were hosted using the Zoom web conferencing platform. Two meetings were scheduled and had individuals RSVP, however one of scheduled meetings was canceled after none of the individuals who reserved a spot attended.

The results of the community engagement efforts were presented to the Board of Maunakea Management via Zoom during the Board's regular meeting on January 12, 2021. A detailed overview, along with a summary of the results for each of the community engagement activities can be found in the sections that follow.

# I. VIRTUAL OPEN HOUSE

## Overview

The project team developed an interactive virtual open house website with information about the new educational telescope including a PowerPoint presentation, informational graphics and descriptions, interactive alternatives sites map and a public comment form. The objective of the virtual open house website was to share information and gather input from the public via a publicly accessible website. The website launched on Saturday, September 26, 2020 and the public was invited to comment on the project for a period of one month lasting through Monday, October 26, 2020.

The virtual open house website was widely shared via email, press release, social media, and other formal and informal means of communication. Each notification for input resulted in positive increases in the number of website pageviews and number of comments submitted thru the webpage. Press release notices were prepared and distributed by the University of Hawai'i Office of Communications. Three (3) press releases were generated in total; to formally open the comment period and announce the open house webpage; to announce the midway point of the comment period; and over the final weekend of the comment period. The final press release notice resulted in a significant amount of new comments submitted due to being widely shared across local news outlets and social media.

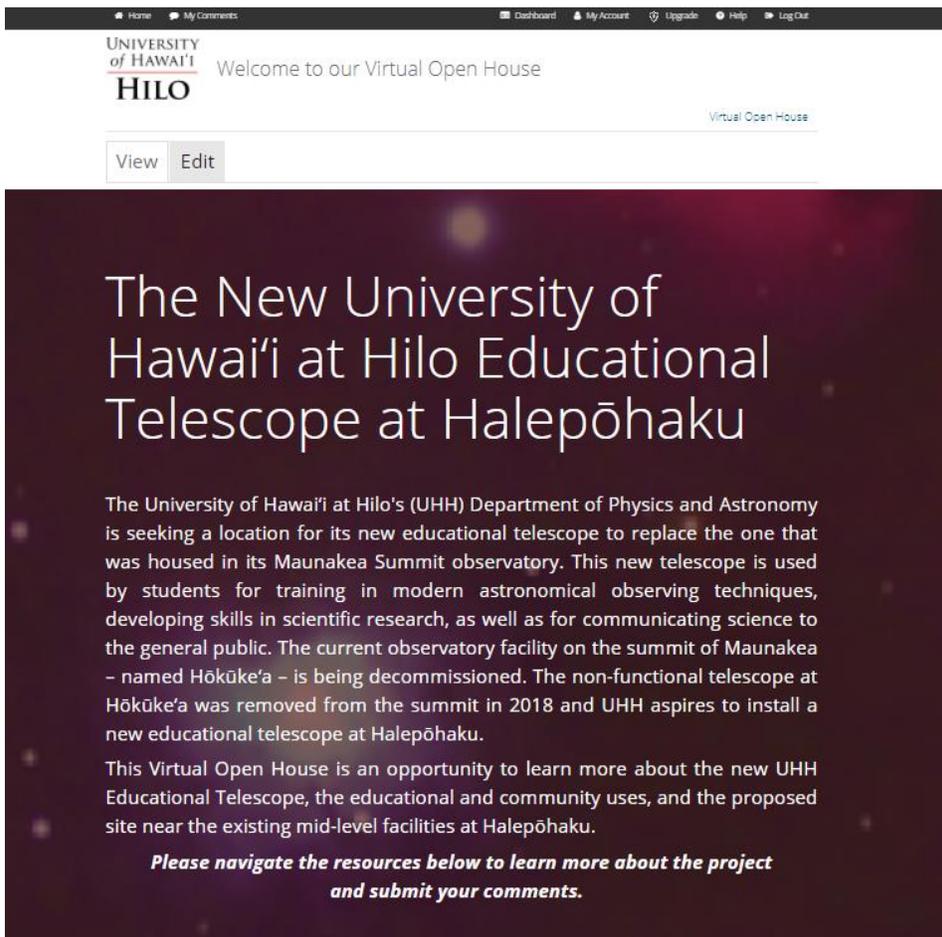


Figure 2: Screenshot taken of the virtual open house webpage.

This section describes the virtual open house components.

## Project Introduction

A PowerPoint presentation was developed and posted to introduce virtual open house visitors to the project and share how to navigate the open house webpage.

The presentation included information on the project context and background, a summary timeline of events leading up to Halepōhaku being selected as the best site for the educational telescope, details on the existing instrumentation and proposed educational telescope facility itself, and an estimated project schedule. The presentation was embedded onto the website allowing users to click through the presentation at their own pace.

## New Educational Telescope

Posters with images and more detailed information about the new educational telescope, telescope instrumentation and dome were developed and shared on the webpage. The posters included pictures intended to show the scale of the various elements in the new educational telescope facility. Content explaining UH Hilo's benefits from and need for the educational telescope facility was refined by the project team with special regard for framing the project's educational and broader community benefits.

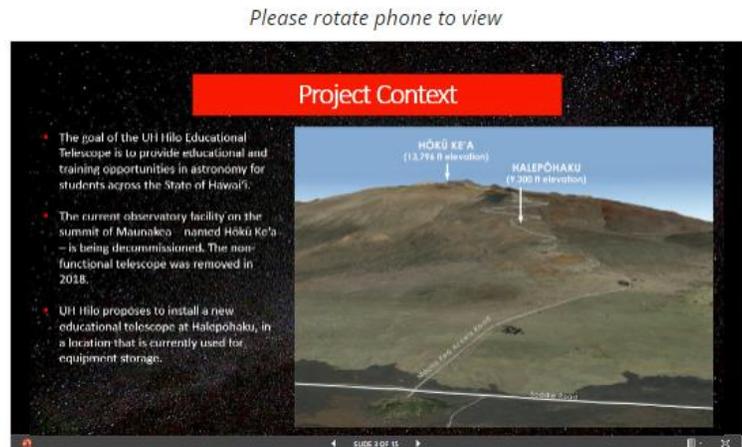


Figure 3: Slide from the project introduction presentation.

## Proposed Site and Alternatives Considered

A google map was created showing the locations of 16 of the alternative sites that were evaluated, including Halepōhaku. The embedded map was navigable and interactive within the webpage, allowing for users to click on specific sites to view more information and images of the sites (note some sites did not have images available). Each site location included the abbreviated pros and cons considered during the site evaluation process that took place over a two-year period between 2016 and 2018.

To accompany the interactive alternatives map, the webpage included an area site map and list of reasons why Halepōhaku was selected as the best site.

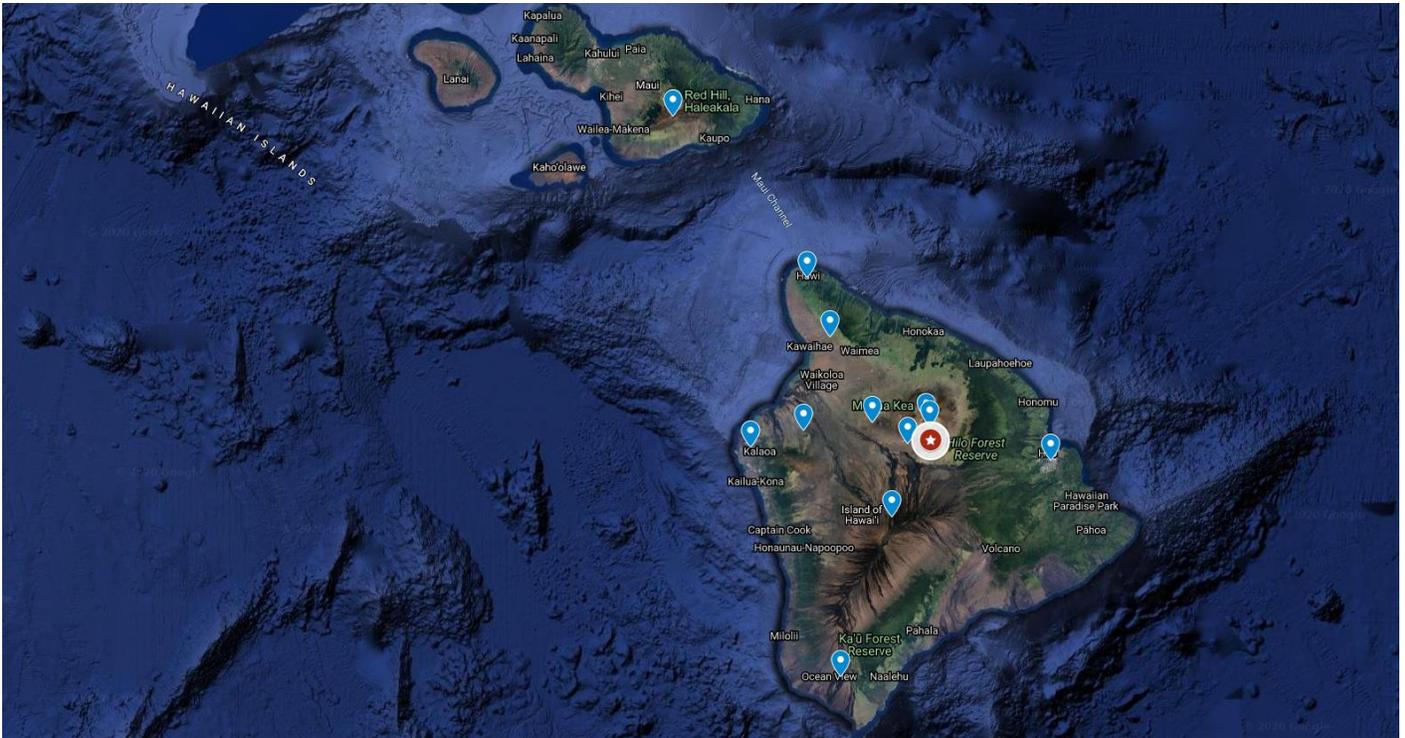


Figure 4: Google map with 16 site alternatives evaluated.

## Project Timeline and Next Steps

The graphic timeline and project schedule presented in the PowerPoint presentation were included in this section of the website. The graphic timeline summarizes key events to illustrate the path that was taken to get from Hōkū Ke'a's refurbishment, the new educational telescope being purchased, Hōkū Ke'a chosen to be decommissioned, to Halepōhaku being identified as the best site for the new educational telescope facility and launch of this outreach effort. The project schedule identified the next steps and estimated timing for the proposed project to include the Environmental Assessment, design and permitting, and construction.

## Leave a Comment

After scrolling through the elements summarized above, visitors to the webpage were invited to leave a comment and sign up for the project email list.

Results from the Virtual Open House are summarized below with a more detailed analysis of the comments received in Section V.

# Results

The virtual open house was open for 30 days, launching on September 26th and closing on October 26th, 2020. During this timeframe, web traffic associated with the website was tracked using Google Analytics. Figure 5 below summarizes the public's engagement with the website over the 30-day open period. A full Website Analytics Report is included in Appendix 3.

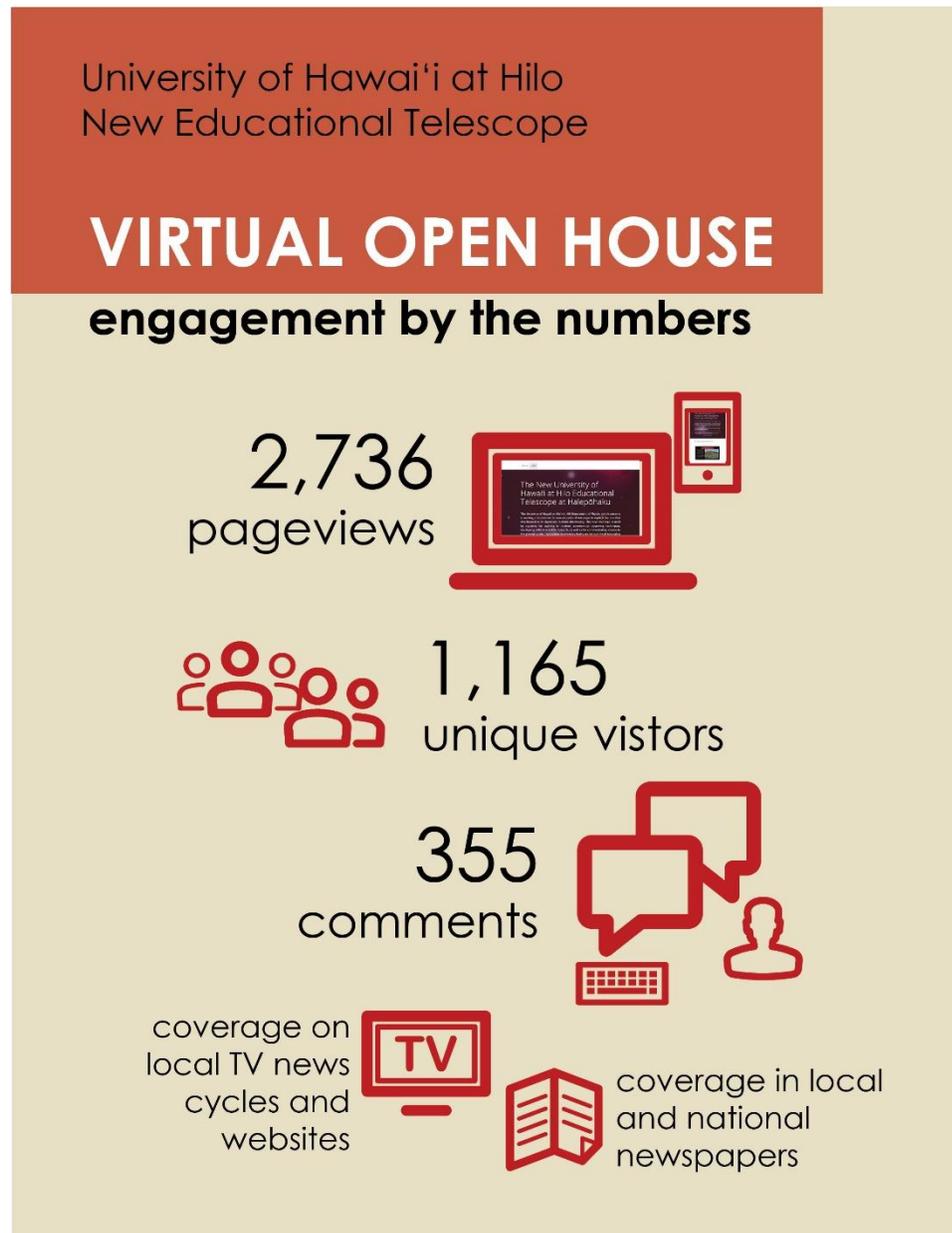


Figure 5: Virtual Open House Engagement Summary

Google Analytics allows collection of demographic and georeferenced data of users who visited the virtual open house website. Google Analytics tracks user data based on user accounts and through third-party cookies, when available. The figure below breaks down the location of individuals who visited the virtual open house website.

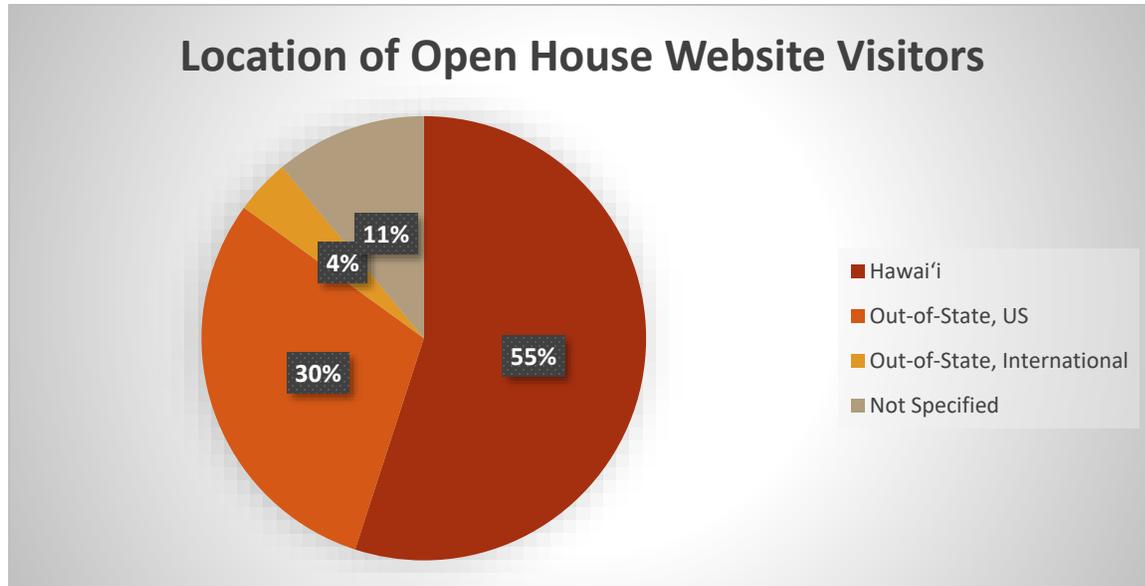


Figure 6: Location of Virtual Open House website users

Location was broken down further for those who provided comments on the virtual open house website using publicly available IP Address geolocation. Of the 355 total comments, 340 were able to be geolocated. From the 340 geolocated comments, approximately 70% came from within the state of Hawai'i and of that amount, 56% of the Hawai'i comments came from individuals within Hawai'i Island.

Total Sample	340	100%
From Out of State	103	30%
From Hawai'i	237	70%
<i>Subset from Hawai'i Island</i>	133	56%
		<i>(of the 70% from HI)</i>

Figure 7: Location of Open House Website Commenters, based on IP Address location

More detailed breakdown of the prevalent themes expressed in the comments can be found in Section V.

## II. INFORMATIONAL AND PROMOTIONAL MATERIAL

### Summary

Promotional and informational material was developed during the design of the virtual open house and used to make the public aware of the outreach effort and to drive interested individuals to the webpage.

### Promotional Material

An initial email was sent on September 26, 2020 to approximately 100 individuals and organizations on UH-Hilo's stakeholder list inviting them to visit the virtual open house website and provide input via the comment form.

The UH Office of Communications concurrently prepared press releases and promotional material to be shared with the public and media outlets. The UH Office of Communications published press releases promoting the virtual open house on the following dates:

- Saturday, September 26, 2020
- Monday, October 12, 2020
- Saturday, October 24, 2020

The UH News Facebook page published a short video announcing the opening of the virtual open house and encouraging public feedback. The video was published four times on their Facebook timeline:

- Tuesday, October 6, 2020
- Monday, October 12, 2020
- Tuesday, October 20, 2020
- Saturday, October 24, 2020

#### CONFLICT ON MAUNA KEA

### University of Hawaii proposes teaching telescope on mountain



(Source: Hawaii News Now)

By [Associated Press](#) | September 29, 2020 at 5:14 AM HST - Updated September 29 at 5:14 AM

HILO, Hawaii (AP) — The University of Hawaii has proposed installing a teaching telescope on the state's highest mountain and is seeking public input on the project.

The university plans to solicit public comment on the plan for the telescope on Mauna Kea, the site of a months long protest against the proposed construction of a giant telescope, The Hawaii Tribune-Herald [reported](#) Saturday.

The university proposed to install its teaching telescope at Halepohaku, a mid-level facility located on the mountain at 9,200 feet (2,804 meters) elevation.

The 28-inch (71-centimeter) telescope is far smaller than the stalled Thirty Meter Telescope project, which opponents said would desecrate land considered sacred by some Native Hawaiians.

Figure 8: Hawaii News Now story, 9/29/2020.



#### Public invited to virtual open house on proposed UH Hilo teaching telescope

 University of Hawai'i News  
October 24 at 2:31 PM · 

 The University of Hawai'i at Hilo invites the public to participate in a month-long, virtual open house from September 26 to October 26 to learn about the proposed 28-inch educational telescope at Halepohaku, the mid-level facility on #Maunakea. Details: <https://bit.ly/3cCQFcx>

  4

 Share

Figure 9: Screenshot from UH News Facebook Video.

## Informational Material

The following informational materials were developed and posted to the virtual open house:

- Educational Telescope Posters with specifications for: (1) the PlaneWave CDK 700 0.7m Telescope and (2) the AstroHaven 18-foot Dome;
- Visual renderings showing the scale and in-ground structure specifications for: (1) the dome and platform and (2) the platform footings and telescope post;
- Maunakea Elevation Map with Halepōhaku and Hōkū Ke‘a locations identified;
- Halepōhaku Area Map showing location of the proposed site in relation to other nearby facilities;
- Project Location Map with new educational telescope footprint.

## Results

### MailChimp Email Blast

An initial email was sent on September 26, 2020 to approximately 100 individuals and stakeholder groups inviting them to visit the virtual open house and provide input comment. Of the emails sent out, 56 were opened by recipients.

All email list sign-ups from the open house website were added to the MailChimp account. A newsletter template was also created to allow for uniform communication about the project moving forward. Of the people who submitted comments, 112 have signed up to receive future email updates about the project.

### Press Release #1

The first press release announcing the virtual open house to the public saw broad coverage in both print and television between September 26-27. The story was aired in both the AM and PM news and was also featured on the front page of the Hawai‘i Tribune-Herald.

### Press Release #2

The second press release was published October 12, 2020 and reminded the public that there were two weeks remaining to visit the virtual open house and leave a comment. The story aired again on the PM news and was featured online via various news outlets.

### Press Release #3

The third and final press release went out on Friday, October 23rd and informed the public that the comment period and virtual open house close on October 26th.

In addition to news coverage, the story and information were picked up by a number of social media accounts, bringing greater attention to the virtual open house.

The Hawai'i Tribune-Herald and West Hawai'i Today also ran a story on October 25th, which was printed below the bottom fold on the newspaper's front page. The story interviewed two individuals who oppose the educational telescope's proposed location at Halepōhaku. The news story was widely distributed nationally through the Associate Press.

## Facebook Video

The University of Hawai'i News Facebook video was posted on three separate occasions garnering a total of 128 views.

Press Release	Print	Television
Press Release #1 (9/26/2020)	Hawai'i Tribune Herald; West Hawai'i Today	KITV; Hawai'i News Now
Press Release #2 (10/12/2020)		KITV; Hawai'i News Now
Press Release #3 (10/23/2020)	Hawai'i Tribune Herald; West Hawai'i Today; Honolulu Star-Advertiser	Hawai'i News Now; KHON
Article: "TMT opponents oppose Halepōhaku teaching telescope plan" (Michael Brestovansky)	Hawai'i Tribune Herald; West Hawai'i Today; Honolulu Star-Advertiser; The Maui News; Associated Press Wire Service	

Figure 10: Summary Table of Press Coverage

### III. STAKEHOLDER MEETINGS

#### Summary

Three (3) targeted stakeholder meetings were scheduled among 56 individuals and stakeholders. The meetings were scheduled to be held virtually via the Zoom web conference platform. The purpose of the stakeholder meetings was to make sure that people and organizations across the spectrum understood the purpose and objectives of this initial outreach effort and extended an opportunity to discuss any questions, concerns and provide input.

The targeted stakeholder list was broken into the following stakeholder groups:

- Commerce
- Land Use
- Community Association
- Community Organization
- Hawaiian Civic Clubs
- Education
- Historic

Stakeholder meetings were scheduled, and stakeholders were invited via email to RSVP. The email invitation also asked the invitee to recommend certain kūpuna or other interested parties whom they believed should be consulted. The meetings were reserved for the following dates/times:

- Thursday, October 15th at noon – Commerce, Land Use, Historic, Community Organizations
- Tuesday, October 20th at noon – Education
- Tuesday, October 20th at 2 pm – Hawaiian Civic Clubs and Community Associations

Invitation for all three meetings were emailed out on October 6th and reminder emails were sent again two days prior to each meeting.

A fourth meeting slot was held for Thursday, October 22nd if attendees recommended meeting with others not invited to the first three meetings, however no recommendations were received.

## Results

Only one of the three scheduled meetings was attended, the other scheduled meetings were canceled. No invitees responded to RSVP for the Tuesday, October 20th meeting for educators and although RSVPs were received for the second meeting on Tuesday, October 20th scheduled for 2 pm, no one attended.

Twelve people RSVP'd for the meeting on October 15 and six attended. At the meeting, the project team introduced themselves and gave a brief Powerpoint presentation explaining the project context, educational telescope facility, and project timeline and next steps. The presentation also encouraged those in attendance who had not participated in the virtual open house, to visit and leave comments. After the presentation, a facilitated discussion was held, which allowed participants to ask questions and provide feedback. During the question and answer the following questions were asked (responses from the project team are included in *italics*):

**Q: So even though the proposed area is adjacent to an existing building, and it has been previously graded to store equipment, an EA is still required?**

*Yes, EA is technically required because this is a State funded project and on State lands. The project is also in the conservation district so would also require a CDUA, all are triggers.*

**Q: For such a small footprint, two years for design and construction seems long...**

*An EA can take anywhere from 6-9 months to longer; discretionary permitting is a 6-month process. The design is relatively simple but just the environmental and entitlement processes can take up to two years. Also, the building permit process, which will take at least 6-12 months.*

**Q: Where will the control room/ops room be located? [A]lso at Hale Pohaku or down in UHH Campus?**

*Mostly on campus since the students will be on campus most of the time. We envision that it will be operated two ways – for the first part of the night it will be operated remotely and the rest of the night it will be operated robotically. It is envisioned that a room in Dorm A will host the local computers and electronics and be used for setup, storage and maintenance for the telescope. The main building at HP could be used as a on-location room for teaching group of students, if needed.*

**Q: Is there federal funding associated with this project?**

*No. Triggers are related to State funding.*

**Q: What is UH Hilo School of Hawaiian Studies position on the project?**

*That is one of the reasons why we are having this process, to get everyone's thoughts and feelings on the project. There are three meetings scheduled. We have heard many different comments through the open house, but we have not yet heard an official position by UH Hilo Hawaiian Studies. The UH Hilo Hawaiian Studies Department is being consulted concurrently with this outreach effort.*

**Q: UH Students will be doing observations from this telescopes [sic], is there a technician (repair, maintenance, instrumentation) program being developed in conjunction with HCC?**

*Not officially, but we have been discussing that now for quite some time. There are a lot of observatories that are looking to hire local staff for operations and engineers. Our plan is to try to have some technical aspect of using the telescope – develop that part as much as possible. UH system doesn't like to duplicate degrees – so an HCC program would have to be different from those offered at other community colleges. I think that they were looking into more electrical type.*

**Q: It may be good to inform the public explicitly where the funding has come from. The telescope and dome funds came from the State as a capital improvement projects (CIP) award to the University.**

*The funding right now for the design and outreach is coming from UHH and the construction costs are being discussed.*

**Q: Will the decommissioning plan and the new project EA be included in the same EA same?**

*These are separate projects, so they are separate EAs. However, when UH Hilo received approval to proceed with the decommissioning of Hōkū Ke'a, it was contingent on finding a new site for the new educational telescope facility.*

**Q: Obviously cultural and archaeological issues are highly sensitive and I will be commenting on Hawaii's proud wayfinding legacy. I did visit [the] virtual open house page and would like to see a more comprehensive list of all of the career path opportunities.**

*We would like to train the next generation of astronomers, but the educational benefits go beyond to all areas of STEM. The training students will receive goes into software, electronics, and most importantly, community outreach – the ability to communicate science with the community is something that is badly needed.*

*Our hopes are also to inspire young minds. A few years ago I received an amazing comment from someone who grew up in Pāhoa and he didn't know what he wanted to do with his life. While a student at UH Hilo he took a field trip to the old telescope on Maunakea and it changed his outlook on what he wanted to do. Today he is one of the premier ophthalmologists in Hawai'i and Polynesia. However, with physics and astronomy we end up in many different areas – we're not a lot of pure physicists and astronomers. We have a list of alumni who have reported back to us on where they have ended up and the list of professions is very diverse.*



## IV. ANALYSIS OF RESULTS

### Summary

The bulk of the community feedback content was received through the virtual open house comment form submissions. A total of 355 individual comments were submitted. The comments received are provided as an appendix to this summary report with names of commenters redacted for privacy. Each comment was assigned an ID number for identification and reference, comments were then analyzed to identify the overall sentiment, whether in support or opposing the project, and categorized under common themes. The results of the analysis are summarized in this section.

The overall breakdown of sentiment in favor of the new educational telescope site at Halepōhaku and those who oppose the project location and/or site is shown in the pie chart below. Overall, 139 comments were in favor of the project, 212 comments were opposed to the project and 4 comments were neutral.

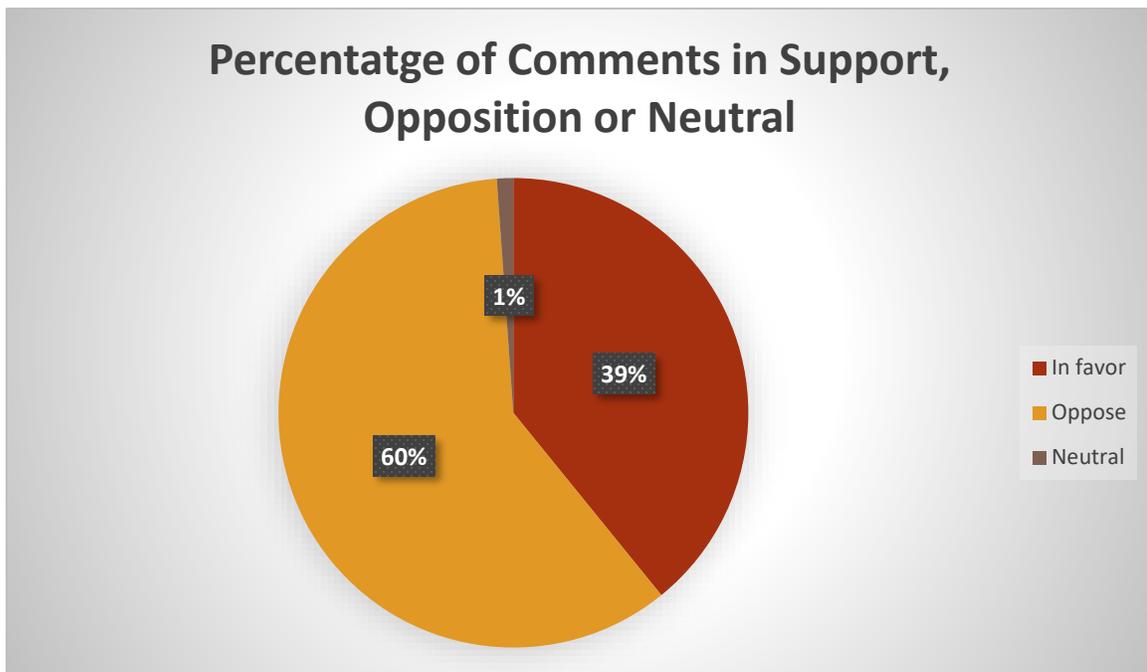


Figure 11: Percentage of Comments in Support, Opposition, or Neutral

# Open House Comments Over Time

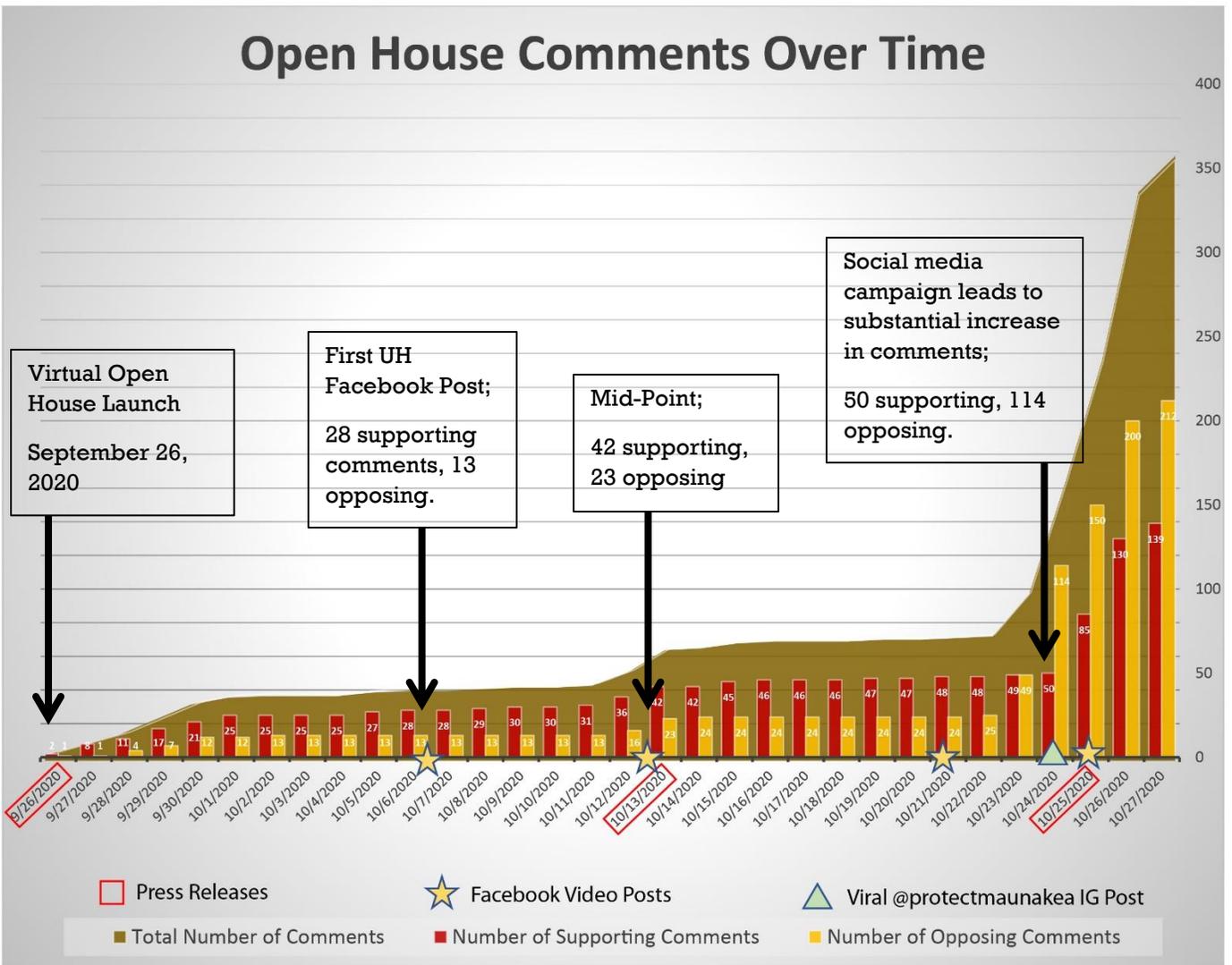


Figure 12: Open House Comments Over Time

Figure 12 further breaks down the rate at which comments were received and the sentiment of those comments over the 30-day virtual open house comment period. Red bars are total supportive comments, yellow bars are total opposing comments and the shaded brown area represents the total amount of comments. The graph in Figure 12 breaks these total down by day and notes significant media events that may have had an influence on driving traffic to the open house. These events include UH facebook posts and press releases as well as one viral social media post that was circulated by a non-UH account. At the mid-point of the open house comment period, 42 comments were in support of the proposed educational telescope at Halepōhaku and 23 opposed. After the viral social media post, the amount of comments opposing the proposal significantly increased.



## **Agree with economic and community benefits**

In addition to the educational benefits, there was support for economic and community benefits resulting from opening the educational telescope to the public and other astronomers in the future. Fourteen (14) comments mentioned benefits to the local economy and twenty-eight (28) comments mentioned benefits to the overall Hawai'i Island community.

## **Agree with Halepōhaku as a good location**

Fifty-four (54) commenters agreed with the preferred location at Halepōhaku and the reasons for selecting the site as presented in the outreach virtual open house. Generally, comments agreed that the site is in good proximity to UH Hilo, ideal for the new educational telescope due to use of an existing facility and previously disturbed area, and ideal for conditions favorable to observations. Many of the comments favoring the telescope being located at Halepōhaku mention that the proposed location is ideal for the students. Some of these comments also mention the belief that the benefits to students will lead to more local students being involved with science.

One commenter who is associated with environmental groups in the state noted that Halepōhaku is a good location because it won't have added effects on the environment. Another commenter suggested that additional environmental considerations should be made to mitigate potential light and dust issues that could impact telescope operations. The comment noted that the location indicated should be well shielded from visitor traffic and vehicle headlights and concerns about dust from vehicles descending the unpaved summit road just after sunset each night when the dome may be open or golf carts used by facility staff on trails between the dormitories. In addition, the large defunct satellite tv dish next to "A" dorm should be removed or repurposed for radio astronomy education.





## Mismanagement of Leased Lands

Twenty-seven (27) comments specifically mentioned reasons for opposition related to an impression that UH and the State has mismanaged the lands leased which has created a level of distrust with the Hawaiian community and public view. Commenters generally hope to resolve mismanagement conceptions prior to the development of the project or others at Maunakea.

Some view the focus on installing a new telescope prior to removing those facilities slated for decommissioning as a show of bad faith on the part of the University. Many suggest that more consultations with the Hawaiian community and lineal descendants be established to help advise on management of the lands.

## Decommissioning process is tied to a distrust in University of Hawai'i

Thirty-eight (38) comments express a level of distrust in the University of Hawai'i's decommissioning process and/or wanted to see decommissioning completed before any new development on Maunakea. There is a general impression that decommissioning Hōkū Ke'a should not allow for a replacement of that facility on Maunakea, regardless of whether the new facility would not be located at the summit.

## Increases of human traffic, negative ecological and social impacts

Fifty-seven (57) comments discussed the potential for more human and vehicular traffic and environmental impacts to Halepōhaku's sensitive ecological setting. These conditions would result in negative environmental impacts within the State Conservation district which could affect existing threatened and endangered species which may be located at Halepōhaku. Other possible impacts mentioned involve potential negative impacts to water resources, local ecosystems, and cultural and social impacts on the Hawaiian community.

A common concern opposing the use of Halepōhaku is that further development at this location would increase vehicle traffic and visitors to the area which is ecologically sensitive. And the increase in both could result in damage to sensitive flora or fauna habitats and culturally important features.

# Neutral Comment Themes

## Decommissioning completion before new developments

Four (4) comments were generally neutral (neither for or against the project at this time) on the project and asked that decommissioning efforts be completed before considering any new facilities on Maunakea.

## Alternative Sites off Maunakea

Twenty-one (21) comments requested that UH consider other alternative sites off of Maunakea. These comments were generally in favor of the educational and community benefits of the project but asked that other sites be considered for various reasons, primarily being cultural impacts.



Other sites mentioned for further consideration included the 'Imiloa Astronomy Center or in locations spread across the island similar to 'Imiloa; and UH Hilo Campus or other UH owned lands. While most of these comments suggested that any place but Maunakea would be better, some others suggested that use of existing telescopes be increased for students such as at the Faulkes telescope on Haleakalā, Maui. Some of these sites have been previously considered and vetted by UH Hilo but deemed infeasible or not aligned with the mission of the new educational telescope.



## V. APPENDICES

1. Informational materials created for Virtual Outreach Efforts
2. Stakeholder list
3. Full Website Analytics Report
4. Full Comments Matrix



# 1. Informational materials created for Virtual Outreach Efforts



Desktop

Mobile

Inbox

## The University of Hawai'i at Hilo New Educational Telescope at Halepōhaku

### Please Join us online for a Virtual Open House

The University of Hawai'i at Hilo is seeking to locate its new educational telescope at Halepōhaku. This will replace its former Maunakea Summit observatory, Hōkū Ke'a.

Visit the Virtual Open House website at any time to learn more about the University of Hawai'i at Hilo's New Educational Telescope and provide your thoughts on the proposed site at Halepōhaku.

**Opens: Saturday, September 26, 2020**  
**Closes: Monday, October 26, 2020**

[Visit the Virtual Open House](#)



Educational Telescope



Proposed Site and Alternatives Considered



Project Timeline and Next Steps



Leave a Comment

*This email is sent from an account used for sending messages only - please do not reply.  
We encourage you to direct your responses to the form on the Virtual Open House Website.*

[view this email in your browser](#)

# THE UNIVERSITY OF HAWAI'I AT HILO NEW EDUCATIONAL TELESCOPE VIRTUAL OPEN HOUSE

---

Join us online to learn more about  
the University of Hawai'i at Hilo  
New Educational Telescope.

**OPENS: SATURDAY, SEPTEMBER 26, 2020**  
**CLOSES: MONDAY, OCTOBER 26, 2020**



Visit the Virtual Open House website at any time  
using the link below or scan the QR code

<https://uhhet.konveio.com/university-hawaii-hilo>

**VISIT THE VIRTUAL OPEN HOUSE WEBSITE TO LEARN MORE ABOUT...**



The New UH Hilo  
Educational Telescope



The Proposed Site &  
Alternatives Considered



The Project Timeline &  
Next Steps

**AND LEAVE A COMMENT**



# UH Hilo New Educational Telescope and Dome

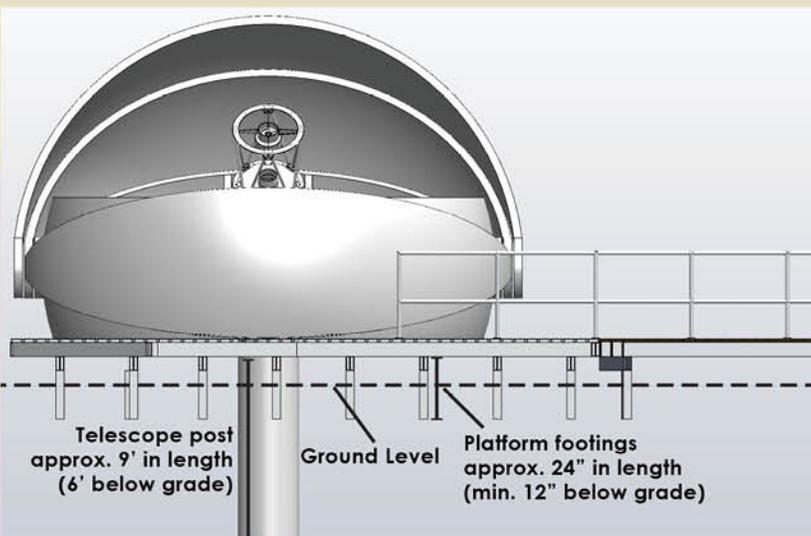
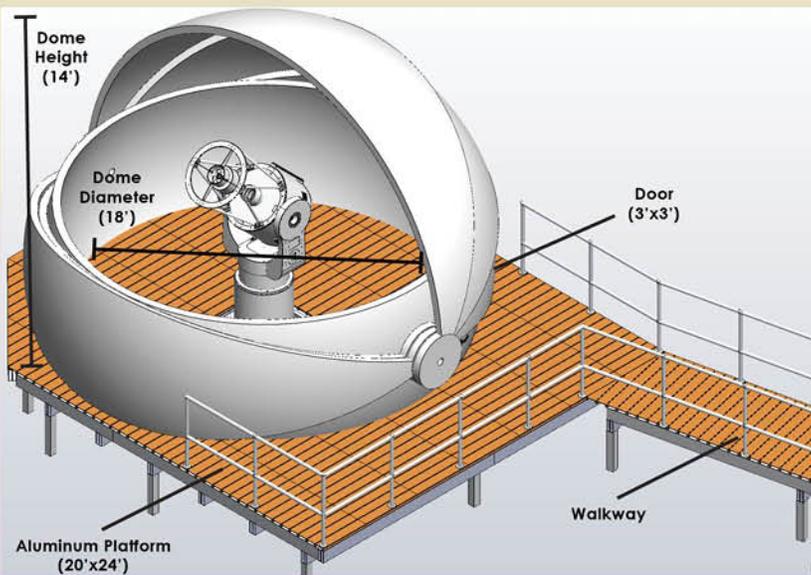
## AstroHaven 18-foot Dome Specifications

Height: 14 feet

Diameter: 18 feet

Material: Infused Fiberglass

Operation: clamshell design, no rotation and can be fully open to view the full sky or partly open to protect against strong winds.



# UH Hilo New Educational Telescope and Dome



## PlaneWave CDK 700 0.7m (28") Telescope Specifications

Height: 8 feet

Weight: 1,400 pounds

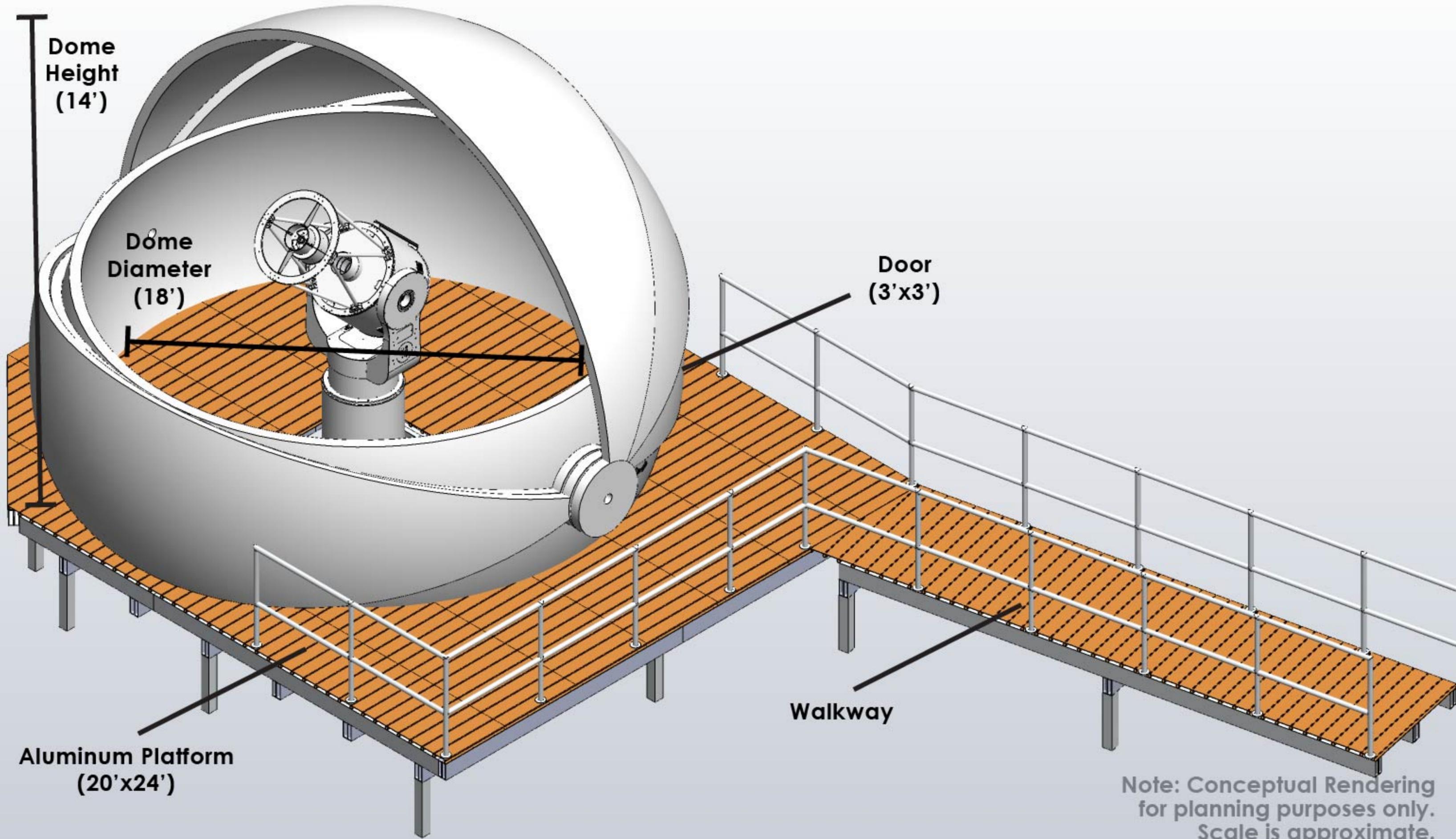
Operation: classical, remote or robotic mode from anywhere with internet access.



## Telescope Instrumentation

Instrumentation suite includes camera and spectrographs for diverse observation projects, from solar system objects, to stars, nebulae and galaxies.





Dome Height (14')

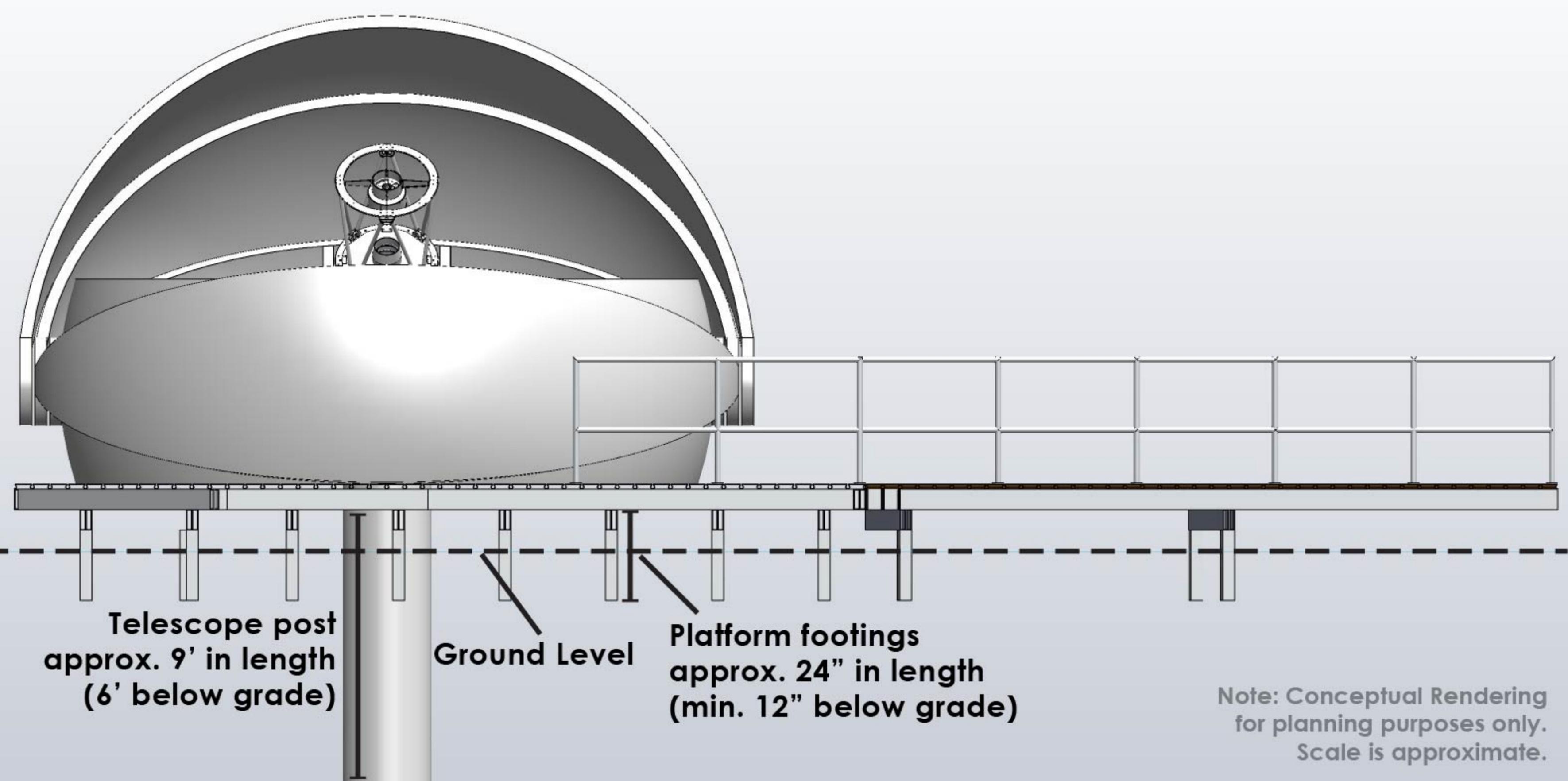
Dome Diameter (18')

Door (3'x3')

Walkway

Aluminum Platform (20'x24')

Note: Conceptual Rendering for planning purposes only. Scale is approximate.



**HŌKŪKE'A**  
(13,796 ft elevation)



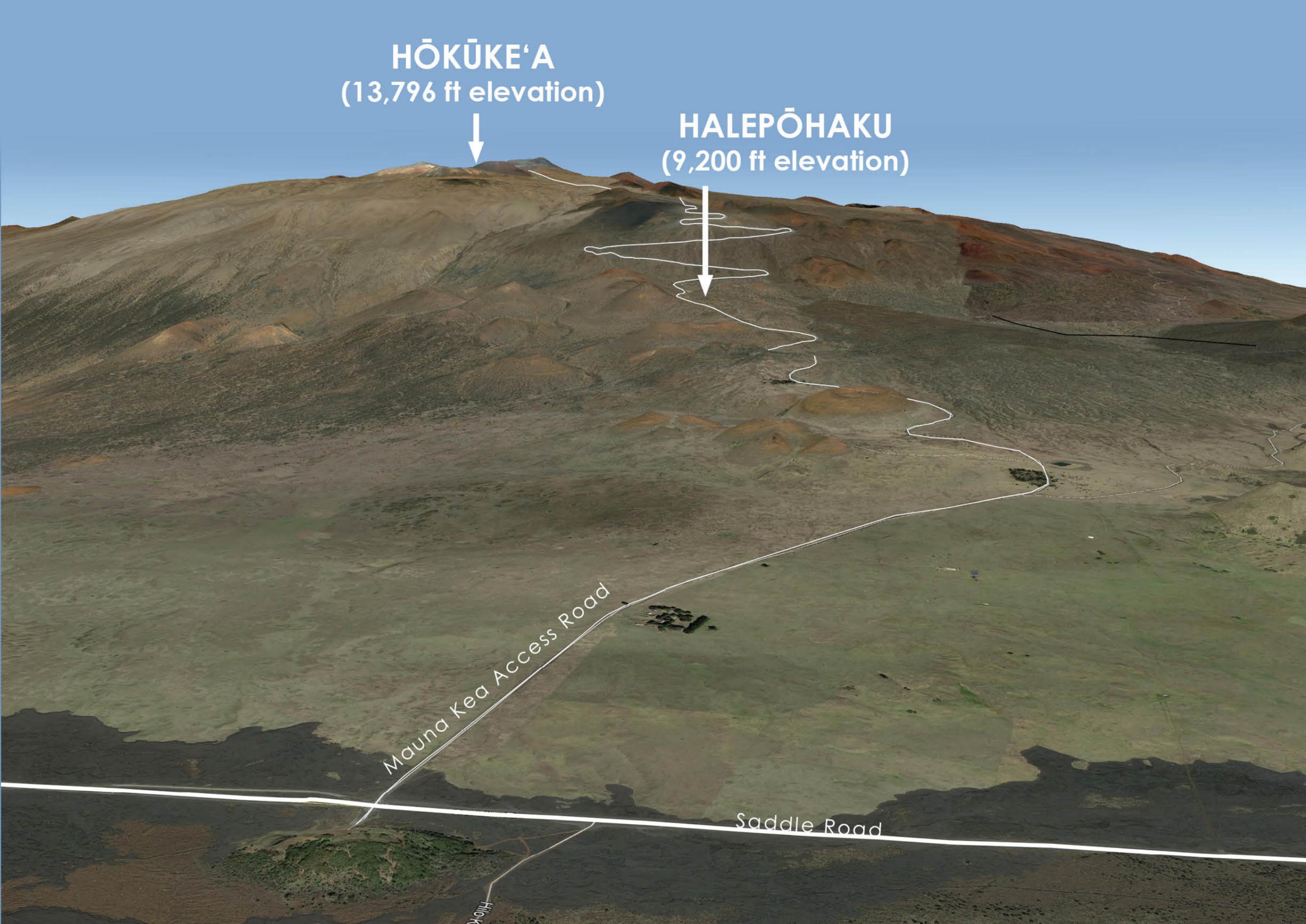
**HALEPŌHAKU**  
(9,200 ft elevation)



Mauna Kea Access Road

Saddle Road

Hilo





TO SUMMIT  
(approx. 8 mi.)

Hiking trail to summit

Summit Access Road

HALEPŌHAKU

Existing Halepōhaku  
Mid-Level Support  
Facilities

Visitors Information Center

Onizuka Center for  
International Astronomy  
and Mid-Level Support  
Facilities

Halepōhaku  
Area Map





**Project** →  
**Location**

## 2. Stakeholder list



<b>Type</b>	<b>Name</b>
Business	Hawaii Island Chamber of Commerce
Business	Kona-Kohala Chamber of Commerce
Business	Hawaii Leeward Planning Conference
Commercial Tour	COMMERCIAL TOUR COMPANIES
Community	Sierra Club - Moku Loa Group
Community	Waimea Hawaiian Homesteaders' Association
Community	Keaukaha - Pana'ewa Farmers Association
Community	Keaukaha Community Association
Community	Kā'ū Hawaiian Home Lands Association
Community	Pi'ihonua Hawaiian Homes Community Association
Community	Panaewa Hawaiian Home Lands Community Association
Community	Nā 'Ahahui: Association of Hawaiian Civic Clubs
Community	Nā 'Ahahui: Moku o Keawe
Community	Nā 'Ahahui: Moku o Keawe -- 'Ahahui Siwila 'o Ke Aloha 'Āina
Community	Nā 'Ahahui: Moku o Keawe -- Hawaiian Civic Club of Hilo
Community	Nā 'Ahahui: Moku o Keawe -- Hawaiian Civic Club of Ka'ū
Community	Nā 'Ahahui: Moku o Keawe -- Hawaiian Civic Club of Laupahoehoe
Community	Nā 'Ahahui: Moku o Keawe -- Kohala Hawaiian Civic Club
Community	Nā 'Ahahui: Moku o Keawe -- Kona Hawaiian Civic Club
Community	Nā 'Ahahui: Moku o Keawe -- Kuakini Hawaiian Civic Club of Kona
Community	Nā 'Ahahui: Moku o Keawe -- South Kohala Hawaiian Civic Club
Community	Nā 'Ahahui: Moku o Keawe -- Waimea Hawaiian Civic Club
Community	Royal Order of Kamehameha
Community	Royal Order of Kamehameha - Ali'i Nui
Community	Royal Order of the Crown of Hawai'i
Community	Makuu Farmers Association
Community	Kaumana Hawaiian Homes Community Association
Community	Waimea Community Association
Community	Kailapa Community Association (Kawaihae)
Community	Keaukaha Panaewa Community Association
Community	La'i 'ōpua Hawaiian Homestead - Kona
Community	Nā 'Ahahui: Moku o Keawe -- Hui Pulaka Hawaiian Civic Club (Keaukaha)
Community	Kohala Institute, Executive Director
Community	Edith Kanakaole Foundation
Community	Kanaka O Puna/Men of Pa'a
Community	Kalapana Community Organization
Community	Kanu O Ka Aina
Community	Ka'u Preservation
Community	Na Pua Noeau
Community	Na Punana Leo
Community	Paniolo Heritage
Community	Kailapa Community Association (Kawaihae)
Community	Queen Liliuokalani Trust
Education	KS-Hawai'i: Po'o Kula
Education	KS-Hawai'i: Po'o Kumu, Kula Ki'eki'e
Education	PUEO
Education	Ka 'Umeke Kā'eo
Education	Kanu o ka 'Aina
Education	Ke Ana La'ahana
Education	Ke Kula 'o Nawahiokalani'opu'u Iki
Education	Kua O Ka Lā
Education	Halau Hula O Ka Ua Kanilehua
Education	Halau Hula O Kahikilaulani
Education	Halau Hula O Kahiwahiwa
Education	Halau Hula O Kou Lima Nani E
Education	Hui mālama I ke ala 'ūlili
State	DOE Hawaii District Superintendents
University	UHH Student Association leadership

Education	Hawaiian Cultural Center of Hāmākua
State	DLNR State Historic Preservation Division
State	Office of Hawaiian Affairs
State	Hawaii State Aha Moku Advisory Committee, Executive Director
University	Hanakahi Council--UHH Native Hawaiian Faculty Advisory Group
State	Office of State Planning
Community	Panaewa Hawaiian Home Lands Community Association
Individual	Ashley Kierkiewicz
Individual	Bob Masuda
Individual	Brannon Kamahana Kealoha
Individual	C.M. Kaho'okahi Kanuha
Individual	Chandell Asuncion
Individual	Cheyenne Perry
Individual	Cindy Freitas
Individual	Clarence Kukauakahi Ching
Individual	Cultural & Lineal Descendants
Individual	David Henkin
Individual	Deborah Ward
Individual	Doug Ing
Individual	Dwight Vincente
Individual	Flores-Case 'Ohana
Individual	Hank Fergerstrom
Individual	Hannah Springer
Individual	Herring Kalua
Individual	J. Leina'ala Sleightholm
Individual	Jim Kauahikaua
Individual	Joseph Kualii Lindsey Camara
Individual	Julie Leialoha
Individual	Kai Markell
Individual	Kalepa Baybayan
Individual	Keahi Warfield
Individual	Kealoha Pisciotta
Individual	Lanny Sinkin
Individual	Lehua Vincent
Individual	Leilani Lindsey-Kaapuni
Individual	Leningrad Elarinoff
Individual	Mamo Bezilla
Individual	Moses Kealamakia Jr.
Individual	Nelson Ho
Individual	Nick Agorastos
Individual	Patrick Kahawaiolaa
Individual	Paul K. Neves
Individual	Richard Ha
Individual	Rick Warshauer
Individual	Rob Pacheco
Individual	Roger Imoto
Individual	Ron Terry
Individual	Ross Wilson
Individual	Shane Palacat-Nelsen
Individual	Springer Kaye
Individual	Thomas Chun
Individual	Tiffnie Kakalia
Individual	U'ilani Naipo
Individual	Wallace Ishibashi
Individual	Noe Noe Wong-Wilson
Individual	Larry Kimura
Individual	John De Fries
Individual	Kala Asing

### 3. Full Website Analytics Report

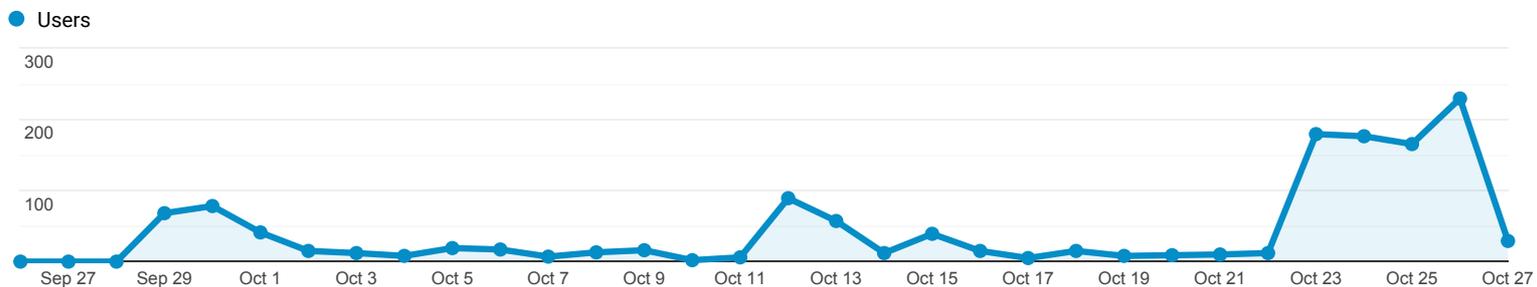


## Audience Overview

Sep 26, 2020 - Oct 27, 2020

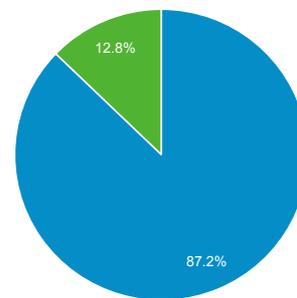
All Users  
100.00% Users

### Overview



<p>Users</p> <p><b>1,165</b></p>	<p>New Users</p> <p><b>1,165</b></p>	<p>Sessions</p> <p><b>1,545</b></p>
<p>Number of Sessions per User</p> <p><b>1.33</b></p>	<p>Pageviews</p> <p><b>2,736</b></p>	<p>Pages / Session</p> <p><b>1.77</b></p>
<p>Avg. Session Duration</p> <p><b>00:02:27</b></p>	<p>Bounce Rate</p> <p><b>65.63%</b></p>	

■ New Visitor ■ Returning Visitor



City	Users	% Users
1. Honolulu	212	17.71%
2. Hilo	191	15.96%
3. Kailua-Kona	61	5.10%
4. Los Angeles	60	5.01%
5. (not set)	36	3.01%
6. Kaneohe	23	1.92%
7. (not set)	22	1.84%
8. Waimea	18	1.50%
9. Kalaoa	16	1.34%
10. Chicago	15	1.25%

Location

All Users  
100.00% Users

Sep 26, 2020 - Oct 27, 2020

Map Overlay

Summary



City	Users	Users
	1,165 % of Total: 100.00% (1,165)	1,165 % of Total: 100.00% (1,165)
1. Honolulu	212	17.71%
2. Hilo	191	15.96%
3. Kailua-Kona	61	5.10%
4. Los Angeles	60	5.01%
5. (not set)	36	3.01%
6. Kaneohe	23	1.92%
7. (not set)	22	1.84%
8. Waimea	18	1.50%
9. Kalaoa	16	1.34%
10. Chicago	15	1.25%
11. Seattle	15	1.25%
12. San Francisco	14	1.17%
13. Kapolei	14	1.17%
14. Ashburn	14	1.17%
15. (not set)	14	1.17%
16. Mililani	13	1.09%
17. Portland	12	1.00%
18. Kailua	11	0.92%
19. Pearl City	11	0.92%
20. Irving	11	0.92%
21. (not set)	11	0.92%
22. Kahului	10	0.84%
23. Ewa Beach	9	0.75%
24. Las Vegas	9	0.75%
25. New York	9	0.75%
26. Kihei	8	0.67%
27. Dallas	8	0.67%
28. Sydney	7	0.58%
29. Waianae	7	0.58%
30. Waimalu	7	0.58%

31.	(not set)	7	0.58%
32.	Lihue	6	0.50%
33.	Pukalani	6	0.50%
34.	Waipahu	6	0.50%
35.	Baltimore	6	0.50%
36.	Oakland	5	0.42%
37.	Marine Corps Base Hawaii	5	0.42%
38.	Nanakuli	5	0.42%
39.	Castro Valley	4	0.33%
40.	Long Beach	4	0.33%
41.	Tallahassee	4	0.33%
42.	Munich	3	0.25%
43.	San Jose	3	0.25%
44.	San Ramon	3	0.25%
45.	Santa Ana	3	0.25%
46.	Tampa	3	0.25%
47.	Koloa	3	0.25%
48.	Kula	3	0.25%
49.	Wahiawa	3	0.25%
50.	Waikoloa Village	3	0.25%
51.	Bellevue	3	0.25%
52.	Bonney Lake	3	0.25%
53.	(not set)	3	0.25%
54.	(not set)	3	0.25%
55.	(not set)	3	0.25%
56.	(not set)	3	0.25%
57.	(not set)	3	0.25%
58.	Phoenix	2	0.17%
59.	Goleta	2	0.17%
60.	Hayward	2	0.17%
61.	Ontario	2	0.17%
62.	San Leandro	2	0.17%
63.	Walnut Creek	2	0.17%
64.	Yucca Valley	2	0.17%
65.	Denver	2	0.17%
66.	Danbury	2	0.17%
67.	Savannah	2	0.17%
68.	Aiea	2	0.17%
69.	Haiku-Pauwela	2	0.17%
70.	Lahaina	2	0.17%
71.	Amherst	2	0.17%
72.	Adrian	2	0.17%
73.	Winston-Salem	2	0.17%
74.	Philadelphia	2	0.17%
75.	Salt Lake City	2	0.17%

76.	Arlington	2	0.17%
77.	Bremerton	2	0.17%
78.	Tacoma	2	0.17%
79.	Tromso Municipality	2	0.17%
80.	(not set)	2	0.17%
81.	(not set)	2	0.17%
82.	(not set)	2	0.17%
83.	Dubai	1	0.08%
84.	Brisbane	1	0.08%
85.	Melbourne	1	0.08%
86.	Perth	1	0.08%
87.	Dhaka	1	0.08%
88.	Coquitlam	1	0.08%
89.	Cambridge	1	0.08%
90.	Ottawa	1	0.08%
91.	Boisbriand	1	0.08%
92.	Montreal	1	0.08%
93.	Rimouski	1	0.08%
94.	Nuremberg	1	0.08%
95.	Dusseldorf	1	0.08%
96.	Meschede	1	0.08%
97.	Roskilde	1	0.08%
98.	Pamplona	1	0.08%
99.	San Cristobal de La Laguna	1	0.08%
100.	Helsinki	1	0.08%

Rows 1 - 100 of 255

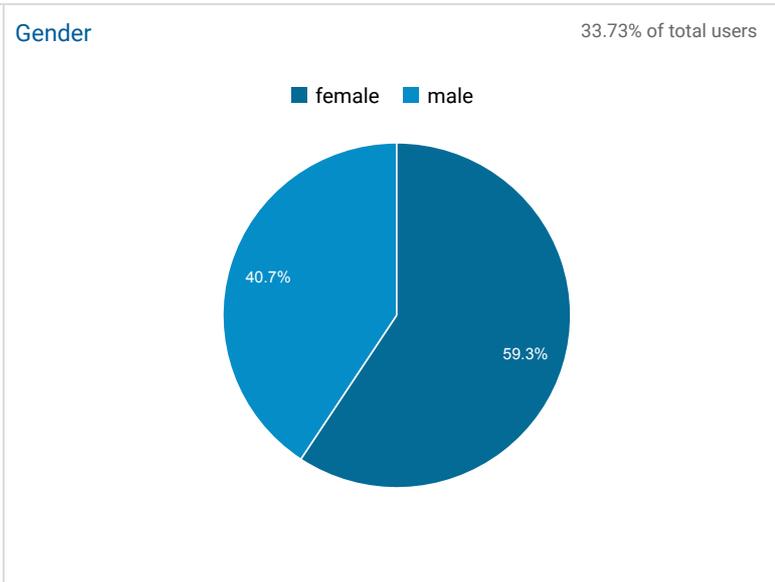
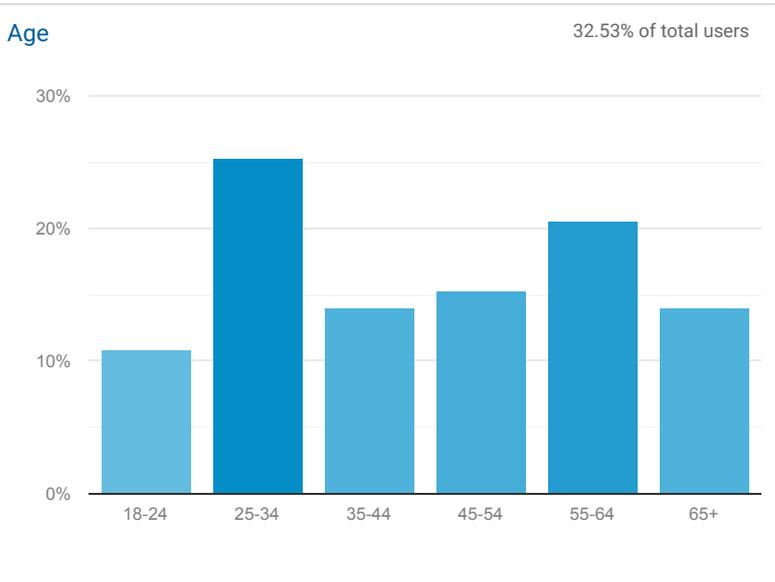


## Demographics: Overview

**All Users**  
100.00% Users

Sep 26, 2020 - Oct 27, 2020

### Key Metric:



# 4. Full Comments Matrix



# Appendix 4 – Comment Analysis

Comments were analyzed to identify the overall sentiment, whether in support or opposing the project, and categorize specific topics or themes presented in the comments both for and against the project. Table A1 below contains a legend of the different codes used to analyze and organize each topic or theme. Table A2 contains all comments that expressed support for the project and Table A3 contains all comments opposing the project. Both Tables A2 and A3 include a column identifying the codes for the topics/themes contained in each comment. For the privacy of all who commented, names have been redacted and each comment was given its own ID number.

Table A1: Legend of Comment Topic Codes

<i>Support</i>	
Topic	Code
Educational benefits	A
Economic benefits	B
Community benefits	C
<i>Oppose</i>	
Topic	Code
No new telescopes on Maunakea	d
Indigenous/Cultural impacts	e
UH lease will end	f
Conservation land	g
Maunakea mismanagement	h
Decommissioning related	i

<i>Location Focused</i>	
Topic	Code
Provided alternative sites to consider	J
Good location	K
Site Improvements	L
<i>Impact Focused</i>	
Topic	Code
Increased human activity/traffic	M
Ecological sensitivity	N
Other	O

Table A2: Comments Supporting Project with Topic Codes

<b>COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU</b>		
ID #	COMMENT	TOPIC CODE
1	Please go forward with dispatch. No doubt you will encounter ancient superstition opposition, but it is time to live in the present.	
3	The Hale Pohaku site is a perfect fit for the new telescope. I hope it helps the students of Hawaii to fulfill their dreams of exploration.	A,K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
4	<p>I envision at some point in the not too distant future, visitors peering through this telescope like the star gazing nights at Onizuka center, while students who are learning to operate it explain what they learned to the visitors. In the process, visitors who are members of the local island community will get an appreciation for astronomy, making them less likely to become adverse to astronomy while students practice what they learned and cement their newly gained knowledge by explaining it in simple terms.</p> <p>I am certain that the importance of community outreach through hands-on viewing by the public is greatly underestimated. Much of the dispute and crises arising over Mauna Kea would certainly not have arisen in popularity if the local community were more engaged in experience astronomical observations firsthand. Instead, what they see is unwelcoming locked up buildings with seemingly nothing to offer. Ideally one day gondolas similar to Sandia Crest/Albuquerque might carry passengers to the mountain to tour the observatories which should have some visitor center attached to them during the day and back down to Onizuka center to view the sky through this telescope at night. On certain days such as Kamehameha day the rides should be free.</p> <p>Community engagement is critical and must not be underestimated.</p>	A,C
5	<p>Aloha,</p> <p>I'm glad to see this telescope being used in a location that will provide some of the best viewing in the world. It's a great learning opportunity for students. I hope people have come to recognize that this little island needs a wide variety of options for our kids to be competitive and succeed right here at home. The UH student telescope is just one more unique way students can appreciate science and the dark sky views from home.</p> <p>Good luck with getting the permits and installing this telescope. I hope people don't try to stand in the way of this amazing tool for students.</p>	A
6	<p>With such easy access to the world's premier observatory sites, I am in favor of moving ahead with the proposal for the teaching telescope to be installed at the proposed location.</p>	K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
7	Yes. Let's do this. We need more opportunities for our children to learn, grow and participate.	A
8	<p>The site is perfect from logistical and conservation aspects. The proximity to the services of Halepōhaku insure easy and safe access for staff and students. Given that access it is more likely that the facility will be properly used and be more valuable.</p> <p>From a science aspect I am not so certain. I am wondering what site testing has been performed. My personal observations from setting up a similarly sized portable 45cm telescope at Halepōhaku is that katabatic air flow down the slopes can lead to poor seeing conditions later into the night. This is likely exacerbated as the Halepōhaku site is in a low depression surrounded by a number of pu'u and at the base of the very steep southern face of the mauna. I do mean very poor, with seeing sometimes worse than 10 arcseconds on otherwise calm nights.</p>	A,J,K
9	I believe this will be a great thing for students to advance their astronomical skills. It takes a small footprint on the mountain and is at a lower altitude for people to use more easily. We need to educate our citizens about the importance of astronomy to our society. I hope someday it will be open for public presentations too.	A
11	This online site is very well put together and easy to use to learn more about the proposed UH Hilo Educational Telescope. I checked all the possible sites' pros and cons, and do agree that the proposed site at Halepohaku is the best location to choose. It is a great location for local students to visit, to learn how the telescope works, to view the clear night sky, and to get a taste of what it may be like to work at a higher elevation. I am excited for this project to go forward at this location.	A, K
13	I love it and I hope you can build it there. I will be a feather in the cap for UH Hilo and astronomy everywhere.	A, J, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
14	<p>I think this telescope facility will be a great tool for UH students. Hale Pohaku is a great site. Mauna Loa Observatory (MLO) would be even better, I work up there at night and I know that it is excellent. I don't understand why it is listed as "not available/permittable", that's unfortunate. MLO is under federal land rules, but about one mile away and downhill from MLO, right on the paved road but not in the MLO facility, is an unused existing observation site that was used by Tokyo University, it hasn't been used in recent years but you can see a UH RV still parked there and a number of small observation experiment structures, I've heard that this site was leased from the State and so it is under State land rules (unlike MLO), maybe that is better for this telescope project? Maybe Tokyo University and UH already have an agreement that can be modified for adding the telescope at this site or for re-purposing the site for your telescope project, why else would there be a UH RV there if there isn't some kind of UH involvement there already? Good Luck! In case the Maunakea protest-related heat gets ridiculous please consider the possible option I mentioned on Mauna Loa slightly below MLO and already established by Tokyo University and our State and possibly UH also. Let me know if you want more information about this site, I could send pictures and maybe find some contact information.</p>	
16	<p>Hale Pōhaku is the only choice. It's the right altitude and not quite as tough on the students as the summit. It's a win-win. Don't let a few loud mouth protesters chase away this opportunity for students to share a world class learning experience on Mauna kea.</p>	K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
17	<p>The student scope should be built at Hale Pohaku because it is excellent place for the students to learn the basics but still in a good enough place to do some real science. This location also deals with air turbulence unlike the summit sites, giving the students one more obstacle to learn from. The facility that is already built will offer convinces that will minimize impacts of this telescope elsewhere like the need for a outhouse, heated room and a parking lot, along other essential needs. Protestors are opposed to this project but they are against this telescope for other reasons and that’s not fair to be taken out on the students. How is it UH astronomy students fault the Hawaii kingdom does not exist anymore? When determining the location I really hope it does not come down to what group can yell the loudest, or have the largest social media presence or be determined enough to sit in the middle of a road for 9 months, it needs to be determined by facts and environmental surveys. Build the student scope at Hale Pohaku and let it educate and inspire UH students to be the best astronomers in the world.</p>	A, K
18	<ol style="list-style-type: none"> <li>1. Good decision to place this observatory at Halepohaku. The summit road does not need any more traffic.</li> <li>2. There should be an alternative program for us, the general public, to get educated and involved w/astronomy w/o being a full time student. After all, we live at the foot of the world's greatest observatory platform.</li> </ol>	K
19	<p>I strongly support the installation of this telescope at Halepohaku, although the near-summit site was clearly superior. It is important to improve the education of UH Hilo students, and this would make practical engineering and science work available to them. The site at Halepohaku is already developed, and there would be no perceptible change. We need more students to become engineers in Hawaii, and this is a great way to encourage this. At my current job as a scientist in private industry, we do have trouble recruiting people from Hawaii who have the expertise we need. This would directly address our employment requirements and would help grow an industry independent of tourism.</p>	A, B, K
22	<p>Heck yes, put the telescope at Hale Pohaku. It’s about time.</p>	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
23	<p>I'm really excited to see this moving forward!</p> <p>I earned my degree in astronomy at the University of Texas at Austin. We had the good fortune to have a 16" telescope available to us for our observational astronomy classes. The instrument suite was modest by comparison to what Hōkū Ke'a will have available, but it served all of the students well. Without that first-hand knowledge of observational techniques I never would have wound up where I am today. I owe a great deal of thanks to the RLM 16" and to Dr. Mary Kay Hemmenway, my advisor, advocate, and friend. I am overjoyed to see UH Hilo raising the bar. I can only imagine how fast and how far the UHH students will go.</p> <p>Keep looking up!</p>	A
25	I love it! Please, build this thing to support our future!	
30	<p>I am in favor of putting a UH educational telescope at Hale Pohaku after many delays.</p> <p>The location indicated should be well shielded from visitor traffic and vehicle headlights.</p> <p>I have concerns about dust from vehicles descending the unpaved summit road just after sunset each night when the dome may be open.</p> <p>Much closer to the proposed site there are golf carts used by MKSS staff during the day stirring up dust as they drive on trails between the dormitories.</p> <p>The large defunct satellite tv dish next to "A" dorm should be removed or repurposed for radio astronomy education.</p> <p>I seem to have missed any mention in the presentation about remote observing and remote operation of this telescope.</p> <p>Since professional astronomy is increasingly done remotely, this capability should be built into this observatory from the start.</p>	K, L
32	<p>UH Hilo desperately need a telescope of their own for student use. It had been planned for so long and never managed to get off the ground. It will significantly enhance the world-wide profile of astronomy at UH Hilo and provide a training ground for future astronomers, engineers, and scientists. Hale Pohaku is a great backup site for this telescope and should be pursued vigorously.</p>	A, K
33	<p>How can we as a community help to promote and have this built. This is a great opportunity for the big island and to encourage science across our educational system. Lets get this built!</p>	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
34	This is a very important endeavor for the youth on the Big Island. Do research, write a paper, get into college. Research expands your capabilities, writing a paper hones your communication skills, getting into college firms up your future. Science matters! Astronomy is cultural! Thank you UofH.	A
35	Please continue to use our mountain. What you learn benefits man kind	
36	<p>I am so happy to see this project be moving forward! When it was announced that the Hoku Ke'a telescope at the summit of Maunakea was going to be decommissioned, my heart sank. The teaching observatory of the University of Hawai'i at Hilo is the scientific observatory which serves OUR community; the community of Hawai'i island. 71% of the UHHilo students list Hawai'i state as a home address, and I can estimate that a majority of that percentage's home address is Hawai'i island itself. The University of Hawai'i at Hilo has the honor to be ranked the #1 Most Diverse National University, the reason why it is able to tout this statistic is because the people of Hawai'i island and Hawai'i state are so diverse. But does the most Diverse National University in the US (in terms of student population) provide the most diverse opportunities in the fields of Science, Engineering, Technology and Math? Even as a UH Hilo Astronomy Alumni, I am not sure. Hawai'i island is a science laboratory and is considered the best places to study a number of scientific disciplines including astronomy and it surprises me that UH Hilo administration does not embrace these scientific opportunities for their students to the fullest extent. The most Diverse National University should not be limiting their students opportunities to excel in all fields.</p> <p>In short, the Teaching Telescope for University of Hawai'i at Hilo will be the beacon of astronomical research and training that can directly benefit OUR island community and genuinely make Hawai'i island a better place to learn and grow.</p>	A, C

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
37	<p>I am very glad to see that progress is being made on this project. After working on the commissioning and integration of this observatory during my senior year at the UH Hilo, I had the experience and tools I needed for my current position at one of the observatories on Maunakea. It is a shame that it has taken this long for the project to move forward. Many students have missed the opportunity to work with hands on equipment during the four years the telescope has been sitting in a room in the Science and Technology building at UH Hilo.</p> <p>This telescope directly effects the education of students in Hawaii. It is time for it to move to a location that will be useful. The site by Hale Pohaku is a great location on already disturbed ground. It provides students with a hand on experience necessary for any science degree without disturbing more land. I look forward to seeing the observatory placed and ready for student use.</p> <p>Mahalo</p>	A, K
39	I think Halepohaku is a great location for this vital student resource!	K
40	I support 100% the plans laid out on this web page for providing a teaching facility for astronomy at Halepōhaku. This facility will serve as a wonderful window for looking into the Hawaiian sky and will serve those living and learning on the Big Island, students, residents, young and old, for many generations to come	A, C
41	I applaud your move to HP, which will give you some of the advantages of the summit while avoiding some of the disadvantages. The PlaneWave should be a reliable telescope. I wish you and your students many happy and exciting nights observing with the new telescope.	K
42	Aloha, I am in support of Hōkūke‘a's permanent establishment at Hale Pōhaku. I think it's very important that clear goals be made and communicated to the public during this community outreach process specifically pertaining to the educational programming that will be implemented into the University system and the public outreach that will be done at the telescope. Mahalo,	A, K
43	I support this education project - maika'i. [REDACTED] - author "The Need for Hawai'i" and "Kamālamalama - The Hawaiian Way to Knowledge, Health and Excellence."	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
44	<p>I made a comment before but the events of this week inspired me to come back. This past week (Oct. 5-10), Hawai'i island was blessed with amazing news from the science/academic world. On Tuesday 10/6, Dr. Jennifer Doudna won the Nobel prize in Chemistry. Dr. Doudna grew up on Hawai'i and attended Hilo High School. On Monday 10/5, Dr. Andreea Ghez won the Nobel prize in Physics for her work in black hole research that takes place on Maunakea. Amongst Dr. Ghez's team is another scientist who was born and raised in Hawai'i and graduated from Hilo High School, Dr. Devin Chu.</p> <p>In Dr. Doudna's biographical works she credits growing up within Hawai'i's unique natural environment as some of her inspiration with getting into science; and indeed our island is a unique natural laboratory. In the past Dr. Chu has cited programs such as Journey through the Universe which inspired him to pursue his academic career. Our environment and our community inspires world class researchers!</p> <p>Yet, neither of these inspired students chose to attend the University of Hawai'i at Hilo upon their graduation from Hilo High School. Why? UH Hilo would certainly have been less of a financial burden than an out of state school. I think the answer lies in the opportunities that UH Hilo could even offer. UH Hilo is in one of the best scientific laboratories in the world with active research in astronomy, biology, ecology, oceanography, vulcanology, geology, chemistry, etc. happening in our backyards. Yet, UH Hilo students are rarely encouraged to participate in this research and have few opportunities to start research of their own.</p> <p>The UH Hilo Student Telescope has the potential to change that and foster the budding scientists that our community naturally creates.</p>	A
46	<p>Those of us who live here know how special Hawai'i is. And the people who first came here, in canoes, traveling using the stars, were some of the best navigators that have ever lived. Our skies are clearer than almost anywhere else on this Earth. Let us honor the ancestors, who paddled into the vast ocean, using the sea and stars to guide them here. Let us use our unique place in the world to now navigate the cosmos. And let our children learn to make their way through the stars. Bring the telescope to the mountain. Use our clear skies and great height to see into the future.</p>	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
47	As a Kamaaina Volcano resident, I and my family support the construction of the educational telescope which will benefit local residents and science itself. Our world is too important and too complex to not encourage education in the sciences. The same goes for TMT. I am a graduate of the UH system and sincerely wish that the educational opportunities for our Keiki are enhanced by the study of astronomy. Aloha.	A, C
48	I support the telescope although I think old, not-in-use telescopes should be dismantled and removed by appropriate agencies.	
49	I am for the new telescope it will be very educational for Hawaii.	A, C
50	What a great tool for UH Hilo students. This is such a logical career path and a wonderful way to enable students to live and work on the island rather than move away. Thank you for your continued support of astronomy! It really is a perfect industry for Hawaii.	A
53	I support the proposal provided consultation with Native Hawaiian Organizations and the State Historic Preservation Division is conducted to select the site that is least impactful to cultural and religious sites.	
58	Looks good, very optimistic.	
61	I am so excited about the prospect of the new educational telescope at Halepohaku! It is a perfect location, and the astronomy students deserve to have their own telescope again.	A, K
62	Put it at Halepohaku and accelerate the decommissioning of the Hokuke site. DO IT NOW!	K
64	Aloha, I support the relocation of the Hōkū Kea telescope from the summit vicinity to Hale Pohaku as the most feasible local for this important teaching tool that will serve as a "gap" research tool for undergraduate students wishing to enhance their educational experience in their consideration of post graduate options. Hale Pohaku is the best environment for this intermediate research and educational tool, it will not only serve the under graduate division of the university but will provide opportunities for local school children and the broader community to share in its use and learning. The location is on previously disturbed land and not near any cultural or historical properties. I believe the Hōkū Kea teaching telescope in conjunction with the Visitor Information Center make this a practical location for mitigating the amount of visitor traffic to the summit.	A, K
65	I am interested in the progress of the new telescope.	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
67	<p>Aloha,</p> <p>It is of course very sad that current situation precludes having Hoku Ke'a at the summit, but I cannot see a better alternative site than Hale Pohaku. We need more local students to work in science at the observatories, so Hoku Ke'a would be a stepping stone for this. It would give UHH students a great learning tools on how to operate a telescope and conduct observing programs. I hope to see this project going forward, and I can't wait to see it installed at Hale Pohaku!</p> <p>Good luck</p>	A, K
68	Halepohaku is an ideal sight for a this telescope. More importantly it will give undergraduates an opportunity to observe from Maunakea, one of the best sites in the world for astronomy.	K
69	I think this is a really great site. I have walked the site and confirm the suitability for putting the telescope there. Maybe this is not the premier site in the world like the summit might be, but this could inspire the students to build better and better adaptive optics for this small telescope.	A, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
70	<p>Hello,</p> <p>I fully support the new UH Hilo educational telescope at Halepōhaku. I believe Hawai'i must continue moving forward as we have incredible potential to be a leader in astronomy and other scientific endeavors. Any efforts against this progress is disrespectful of native Hawaiians' history as some of the greatest early astronomers; we must support and perpetuate this type of leadership in education. If managed effectively and responsibly, with respect to and working with the host culture (transparently, inclusively, and equitably), this telescope and others like it are a path toward diversifying our educational and economic foundations. I am both a student at UH Manoa and a working professional on O'ahu. Hawai'i in general is in dire need of educational and professional resources to encourage local students to use their skills and knowledge to stay and contribute to making their home an even better place. I am hopeful that the quiet majority in support of innovation and progress - and honoring native Hawaiian history - will speak up and prevail over the voices of those who did not choose to become informed before voicing their opinions loudly and publicly. The education of our future generations is far more important than a transient and trendy outcry.</p> <p>Mahalo nui</p>	A, C, K
71	<p>I fully support the teaching telescope being situated at Halepōhaku. Our county desperately needs better education resources, and I am grateful that the plan is this teaching resource can be used by undergraduates, and even high school students. Thank you for working towards helping residents understand the importance of astronomy to scientific advancement, our local economy and to our modern culture. Everyone is inspired when they see the clear night skies from our island - it fills a person with wonder.</p>	A, C, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
72	<p>I support the establishment of the UH Hilo Educational Telescope at Halepohaku.</p> <p>Maunakea is the best site for astronomy on the planet. Halepohaku, being on the slopes of Maunakea, also benefits from clear and very dark skies. Access to such sites is a rarity these days. Such a prized location is a gem that should be cherished and also shared. The site is in a discreet location that is also easily accessible and safe.</p> <p>I support the Educational Telescope because it would benefit the community in general, high-school and college students, and astronomers.</p> <p>The general public will have access to a professional level telescope capable of revealing faint or far away objects, thanks to the quality of the site and to the modern telescope itself. Such incredible sites, that are made available to communities in general, are not common.</p> <p>The Educational Telescope will open up opportunities for many high schools students, including those interested in participating to the Maunakea Scholars program. At the post-secondary level, UH's system of 10 campuses can be leveraged to reach out to students on all Hawaiian islands.</p> <p>Students who use the Educational Telescope will be well prepared for a future career in astronomy, either as a service observer, a telescope operator, an observatory astronomer, or even an engineer, or a teacher. Hands-on experience is a much sought-after skill for observatories looking to hire employees familiar with the tools of the trade, and the Educational Telescope will be an ideal training tool.</p>	A, B, C, K
98	<p>I strongly support landing the educational telescope at Hale Pohaku. This endeavor supports public education and the increases the scientific interest of Hawaii's young people.</p>	A, C, K
144	<p>My wife and I love this new project and think it will greatly advance science and learning on the Big Island. Please keep us "in the loop" as far as the latest developments. We are both "science nerds" and astronomy is one of the wonderful things that have drawn us to the Big Island and kept us here for over twenty years. (I work as a respiratory therapist at QNHCH, my wife is a retired University library researcher at UC Berkeley.</p>	A, C
168	<p>Sounds great!</p>	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
170	It's such a shame that the new telescope has had to sit unused since 2016. This site looks very promising and I hope UH can expedite the construction so the telescope can finally be used!	
172	This looks like an excellent proposal. It will be a real boon to the Big Island and UH Hilo. I support this project wholeheartedly.	B
184	Great concept to benefit science, academia, students and the local economy. A difficult decision considering the loud outcry from some activists. Always know that the being the loudest doesn't translate to having the most support. Be sensitive to the needs of others but steadfast in your resolve for understanding the complexities of the universe. Many more not so loud support your efforts.	A, B
185	<p>Aloha,</p> <p>This plan is an ideal alternative to the decommissioned teaching scope at the summit. It has been a long time coming, but better late than never. I have spent many nights volunteering at the VIS and the weather conditions provide excellent opportunities for observation and experimentation. Halepohaku will provide a safe environment for students. It's easy to access and has comfort facilities already available. Most of HP is underutilized presently and your plans do not appear to impact the area in any negative way.</p> <p>I had the pleasure of working with some of the students in the UHH astronomy program. There's no question that they will benefit from the hands on experience with the new system. I am surprised that there is any opposition to this new installation. It appears to have no environmental impact and will clearly help educate our young people for many years to come.</p>	A, K
187	I'm a Maui resident in favor of this educational telescope project. The university has done a great job of laying out the case for the need of this small facility and the effects on the surrounding environment. Please. Let's help advance knowledge for all of us.	
189	I hope this project moves ahead. Hawaii is such a uniquely important place for astronomy, and science must continue to inspire our young people. It can't be something only for mainlanders while our kids can only look forward to working for hotels and rental car companies.	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
190	<p>I SUPPORT the teaching telescope above Hale Pohaku!!! I support astronomy in Hawaii. I was raised on O'ahu and I graduated from Roosevelt. I now live on Hawaii island and I am an educator. I was finally moved to express my support today when I read in the Hawaii Tribune Herald that anti-TMT opponents oppose the teaching telescope! That is anti science and anti-education and that attitude will be Hawai'i's downfall. Yes to education, yes to wonder, yes to science! Mahalo!</p>	
191	<p>This section from the site says it all! As I part-time instructor at UH Hilo, I strongly support this telescope.</p> <p>Why Halepōhaku Halepōhaku was selected as the best site for the new UH Hilo Educational Telescope for a number of reasons:</p> <p>Although not on the summit of Maunakea, the night sky is very dark (low light pollution) and the stable atmospheric conditions of the site provides great potential for excellent observations.</p> <p>The site has good weather statistics with dry conditions, making it ideal for maintaining the telescope equipment.</p> <p>The facilities are convenient due to proximity to UH Hilo and the site is safe to access.</p> <p>The existing facilities can be adapted to fit the needs and mission of the Educational Telescope (e.g., Dorm A is an option for local control room).</p> <p>Students will be in a supportive educational environment, in close proximity to other students and astronomy professionals staying at Halepōhaku.</p> <p>Students, faculty and staff involved with the telescope will bring the process of astronomy research closer to more Hawai'i Island K-12 students and local residents who would not otherwise be able to go to the summit of Maunakea.</p> <p>Utilization of Halepōhaku maintains UH Hilo's strong connection to Maunakea and its cultural and scientific significance.</p> <p>The site is currently used for equipment storage.</p>	A, B, C, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
192	Having been born in Hawai'i, I am happy to learn about improvements to the educational system and advancements in local technology for teaching children and teenagers about science and astronomy. Exploring space and the cosmos is such an important and inspiring endeavor! I appreciate the opportunity to learn about the University of Hawai'i Hilo and its effort to educate and engage with stakeholders while planning to build the new telescope. I look forward to learning more about this!	A
195	Please build this teaching telescope for the benefit of science and humanity. The opposition pretends to represent the Hawaiian people. I will testify that they do not. The vast majority of my friends and relatives in Waimanalo support astronomy, even the TMT, and many are disgusted with those that try to represent them as being opposed to science. There is no reason that science and Hawaiian culture are at odds.	A
198	I am writing to express my support for the University of Hawai'i Educational telescope. This COVID pandemic has shown us all the dangers of relying so much on tourism as the islands main source of income and jobs. There is no better way to expand our economic opportunities than through science and education.	A, B
199	It is a great idea and good opportunity for students and residents to be able to use a telescope that will give us knowledge of the universe in these technological times, and will expand the experience of the infinite learning process of astronomy and our existence in this beautiful universe.	A
200	I support teaching telescope	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
201	<p>In support! The quote from the site says it all!            Why Halepōhaku            Halepōhaku was selected as the best site for the new UH Hilo Educational Telescope for a number of reasons:</p> <p>Although not on the summit of Maunakea, the night sky is very dark (low light pollution) and the stable atmospheric conditions of the site provides great potential for excellent observations.            The site has good weather statistics with dry conditions, making it ideal for maintaining the telescope equipment.            The facilities are convenient due to proximity to UH Hilo and the site is safe to access.            The existing facilities can be adapted to fit the needs and mission of the Educational Telescope (e.g., Dorm A is an option for local control room).            Students will be in a supportive educational environment, in close proximity to other students and astronomy professionals staying at Halepōhaku.            Students, faculty and staff involved with the telescope will bring the process of astronomy research closer to more Hawai'i Island K-12 students and local residents who would not otherwise be able to go to the summit of Maunakea.            Utilization of Halepōhaku maintains UH Hilo's strong connection to Maunakea and its cultural and scientific significance.            The site is currently used for equipment storage.</p>	A, B, C, K
204	<p>A teaching telescope is a good idea. Astronomers and support people need hands on experience.            Astronomy is in the Hawaiian tradition.            Establishing a teaching telescope at Halepohaku does far less damage to Mauna Kea than bulldozing or construction of a building would near Laupahoehoe or Honokaa (also on Mauna Kea).</p>	A
208	<p>Please ensure this telescope gets built for all of Hawaii and the world</p>	
209	<p>I support this project, the educational telescope at Halepohaku on Maunakea. Hawaii's undergraduate students need access in order to further their learning. Hands on experience is critical and this particular location gives students the best opportunities.</p> <p>Hawaiians have been studying the heavens for generations. This telescope will help many students continue in the footsteps of our kupuna.</p>	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
210	I would love to see that telescope replacing the one that's decommissioned. Hands on education sometimes the best way for educating students. I think it would be a great loss to the university and to the students if they were not able to use this telescope.	A
211	I strongly support Hoku Kea at Hale Pohaku. It's an incredible opportunity to have a working telescope available for students to use in order to supplement the instruction they receive in the classroom. It gives Hawaii students who are interested in astronomy an opportunity to get this kind of hands-on experience right at home without having to go off-island. That's an opportunity I didn't have where I come from, and it's an opportunity I don't think should be taken for granted.	A
212	This is a very worthy project. The virtual tour demonstrates that much careful thought has gone into the design and planning for this new educational telescope. I hope the project receives full funding and support.	
217	I support the teaching telescope	
218	The proposed Hale Pohaku site is very appropriate for the new 28" telescope. The site will clearly make the telescope more accessible to students and, contrary to the irrational opinions expressed by TMT opponents, as reported in today's newspaper, access to a real telescope is essential to the continuation of a viable astronomy education program at UHH. As a longtime member of the Hawaii Island Science community (PhD UHM, 1978; Sci/Tech Director of NELHA, 1982-2003; Staff Scientist for Liquid Robotics, 2008-10; multi-year participant in HIEDB/EDAH Sci-Tech Committee), i strongly support the proposed Hale Pohaku location for the new teaching telescope.	A, K
220	This only confirms my long held belief that the anti-TMT crowd has no interest in compromise, despite whatever lip service they might give to it. Build both the teaching telescope and TMT!	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
221	<p>The UH teaching telescope called Hoku Kea is the only telescope dedicated to student education as its primary purpose. I supported the rebuilding of the dome in 2008-10, and while that ultimately did not succeed, I still believe that this telescope provides an important component to the science education program at UHH. I think was an error on the Governor's part to require decommissioning of the original site. For this reason, I believe that the construction of the telescope, as proposed does not disturb new ground, it is small in stature and does not impact known archeological or cultural sites, to my knowledge. I remain committed to no new industrial expansion, eg TMT, on the Mauna, and this is the one exception I would not strenuously object to.</p> <p>The removal of mamane trees for the VIS parking lot was unfortunate and unnecessary, and the failure of the planners to use appropriate ADA guidelines was entirely avoidable. The closure of ADA accessible toilets and picnic benches is another example of poor planning on the part of the University. I hope that one day, the concerns raised by the public, such as this one, would be heeded, instead of being ignored. I did raise these concerns during public comment period on the EA.</p> <p>I remain strongly opposed to construction of the Thirty Meter Telescope, due to the unmitigated damage to natural and cultural landscape and religious practices of native Hawaiians in the summit region. Since 2008, we have repeatedly requested formal Section 106 (required) consultation regarding the impacts to the Historic District, and to date this request has been ignored. The management of the mountain has been faulted by the legislative auditor, by OHA, by the Governor, and by several university presidents. It is time that the University return to its mission of education, and that management be conducted by a management team advised by members of the community with lineal and environmental responsibilities separate and distinct from the astronomy goals of the IfA.</p>	A, h, K
224	<p>To whom it may concern,</p> <p>I am a resident of Kona, HI, and I 100% support this educational telescope at Halepōhaku. I would also like to express my strong support of the construction of TMT on Mauna Kea.</p>	
227	<p>I am a longtime resident on Oahu, and I strongly support the new UH Hilo Educational Telescope. This project will be an excellent and important benefit to all our community in the state of Hawaii, but most especially to our younger generation and keiki. Indeed, I find it hard to believe that any reasonable person would not support this project. Mahalo.</p>	A, C

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
228	I write in support of UH Hilo's Educational Telescope being located at Halepōhaku. This makes sense educationally (much easier access for faculty, technicians, and students), physiologically (lower altitude), environmentally (less fossil fuel consumed to and from, small footprint in an already developed area), and culturally (removing UHH's current telescope building from the summit region which some Hawaiians regard as "sacred"). The proposed educational telescope will facilitate students learning about the cosmos and perhaps will initiate a future Nobel Laureate Astronomer 's career. Please do not pander to the small percentage of Hawaii's population that is anti-science by NOT building the educational telescope at Halepōhaku. Build it!	A, K
229	I write in enthusiastic support of UH Hilo's Educational Telescope being located at Halepōhaku. Hawaii Island is internationally known as among the finest places on earth from which to study the cosmos. A Nobel Prize was awarded this year to an astronomer who has done her research at KECK. Clearly, astronomy should be an area of excellence for our students and faculty . That there are objections to locating the telescope at Halepōhaku is incomprehensible to me. I can see nothing but benefit for the University, for our students, and for our community in allowing this telescope to be installed at this location.	A, K
230	I write in SUPPORT of the proposed teaching telescope. The unique location of Mauna Kea provides exceptional opportunities for us to learn more about the universe. The proposed telescope will also enhance the education of our community.	A
231	This telescope will be an asset to all who embrace the vision set forth by the University of Hawaii at Hilo. A merging of technology and science will catapult the next generation of students. As a resident of the Big Island for 40 years I enjoy visiting the observatory at Mauna Kea and look forward to learning new things about our hemisphere.	A
233	I am a resident of Hilo. Halepōhaku is a fantastic location for the UH Hilo educational telescope. It is safe and easy to access for our island's students, is a great observational site, and will be in a location that mitigates traffic to the summit while allowing visitors a taste of the fantastic science that is done on Maunakea.	K
234	I am all for training How can one train students without a telescope' I support it and wish it would up abose the inversion zone.	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
235	I strongly support the relocation of the telescope to Halepohaku. It will be an invaluable tool for the astronomy program at UH Hilo. How anyone could oppose this is beyond me. Do not listen to the anti-TMT crowd, who claim not to be anti-science but who oppose science at every turn. I am an ordinary citizen of Hilo and I believe I speak for the majority when I say I want our island to be a beacon for science, science education, and the future of the next generation.	A
236	We should definitely build this telescope. We should not even have agreed to take down 5 telescopes to appease the TMT protesters. We should change the laws to allow telescopes built on Mauna Kea to be exempt from conservation district restrictions on significant impacts.	
237	Seems like the most sensible location to me. Easy access with nearby facilities and no new land will be affected by the location so really no reason to not put it there.	K
239	There is enough space on the slopes of Mauna Kea for hardworking students whose love for the miracles of nature draws them to study astronomy on Hawai'i Island. The proposed site at Halepohaku is a sensible compromise with the potential to re-focus the local astronomy conversation around tangible realities rather than untethered theory and speculation. I strongly support the Halepohaku site proposal.  Best regards	A, K
240	I support the location of the UH telescope at Halepōhaku. The site is already a gathering place for people interested in observing the night sky. It is centrally located on the Island making it accessible to students from all of the Island's communities. It's accessibility encourages students, science and non-science majors alike, to explore astronomical observations and learn about the universe. It's location near the observatories will encourage support for participation in science careers. I strongly encourage the University to locate their telescope at Halepōhaku.	A, K
241	UH-Hilo is my Alma mater and I am proud to be a graduate of a college that provides such unique learning experiences for its students. What a wonderful opportunity we have to be able to provide hands on experience with a working telescope for students of Hawaii and from all over the world. Yes, I hope we can move forward to this worthwhile learning experience.	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
242	<p>I'm supportive of basing the UH Hilo student teaching telescope at Hale Pohaku.</p> <p>It provides a concrete benefit to the educational opportunities of the Island's students while being unobtrusive and avoiding further populating the summit of Maunakea with more telescopes, one of the major points of opposition made by TMT opponents. That is, the teaching telescope would provide a direct and measurable positive effect on the island community while minimizing previously stated perceived negative effects.</p> <p>Why throw away an already paid for--and expensive--perfectly good teaching tool? Would you throw out a bunch of good computers from a computer lab because the building the lab is in the way of a planned future project, thus depriving students and teachers of those valuable (and costly) technological resources or would you relocate the computers elsewhere so they can still be used to benefit the educational community?</p>	A, C, K
245	I fully support the building of an educational telescope at Hale Pohaku.	
249	I believe the educational aspects of this project are a very positive for not only Hawaii Island 's current residents but also for the future of our Island and State.	A
252	education is the only way forward. so much is still to be learned. mauna kea is too valuable to all of mankind for the future of astronomy and the future of mankind itself to be deterred. build it.	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
255	<p>Although I am an astrophysicist, I am not an optical astronomer but work on underground experiments looking for the dark matter in the universe. My comments might be therefore provide a perspective intermediate between the public at large and professional optical astronomers.</p> <p>For me, it is clear that the University of Hawai'i needs a teaching telescope, and the UH Hilo would be a natural leader of the project if this instrument is installed at Hapoleaku at the mid level of Mauna Kea. Although professional astronomers increasingly observe remotely, it is essential to give our students hands-on training on a sufficiently advanced telescope at a good enough site, and clearly Hapoleaku is quite good. This does not apply only to Astronomy undergrads, but also to technician trainees and engineering students who would get experience with installing and tuning real instruments and developing new instrumentation. Such a teaching telescope would therefore support the priority of increasing the pool of expertise among our Hawai'i students, not only for Astronomy but for other advanced technologies for new ventures on the islands.</p> <p>A teaching telescope easily accessible to K-12 field trips and the public at large and integrated within the visitor center, would offer great opportunity of informal education and outreach, inspiring our youth to get involved in science and increasing the participation of all inhabitants of our State in Astronomy. In practical terms, the Hapoleaku site also makes a lot of sense, with easy access and existing support facilities, drastically decreasing the installation costs. Some opponents of the TMT of course see in such a siting the continuation of the desecration of the Mauna. I feel on the contrary that the impact would actually be minimal, and if properly managed, the UH teaching telescope could help bridge the current cultural barriers and misunderstandings.</p>	A, C, K
258	<p>Aloha! Former UHH lecturer in astronomy here. I would like to speak in favor of relocating Hoku Kea to the proposed Hale Pohaku site. It would be wonderful for our students to finally have access to a working teaching telescope - I've followed Hoku Kea's trials and tribulations over the years and this looks like a great plan to finally bring things to a successful conclusion. As usual the "haters are gonna hate", but I can't think of a more accessible, yet less invasive spot to locate the new Hoku Kea than in the VIS/HP area. I wish you great success in managing to bring these plans to completion. Thanks for your time.</p>	A, K
259	<p>Astronomy is a wonderful compliment to our island. It is low impact and creates many good paying jobs.</p>	B
269	<p>I am in favor of opening up educational opportunities through the use of a telescope on Mauna Kea.</p>	A
272	<p>Please allow the use of telescopes on Mauna Kea. Our keiki deserve the educational opportunities now more than ever. Thank you.</p>	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
275	The Big Island deserves to be the preeminent home for Astronomy on planet Earth. Ancient Hawaiʻians were astronomers. It is time to claim and assert this legacy of Hawaiʻi! It is time to create new jobs, studies, opportunities for Hawaiʻi residents, and build an economy that is independent of tourism. Astronomy is the beginning of a better future for Hawaiʻi,	A, B, C
276	In full support of project. Telescope will certainly be one avenue to promote STEM to children of all ages by being more accessible to all. It will also promote importance of astronomy to locals and visitors alike. Look forward to visiting the facility when completed.	A, C
279	I am very much in favor of any wonder full opportunities the aina can provide to the people of Hawaii...education has got to be near the top of the list. I think anyone who uses "culture" as an excuse to further those opportunities is misguided.	A
280	I live in Kona and have attended public lectures presented by the Keck Observatory folks as well as public lectures at UH Hilo and 'Imiloa Astronomy Center. I have also visited the Mauna Kea summit and attended one of the star shows put on my UH staff at the 9,200 foot Visitors Information Center. I've also attended the Astronomy Day public outreach events in Waimea and Kona. I'm a big fan of the science conducted with the telescopes (kudos to Andrea Ghez for her Nobel, btw) and I would welcome the construction of the new teaching telescope at Halepōhaku and I'm also very hopeful that the Thirty Meter Telescope will someday be built at the summit.	A
286	I fully support UHH Educational Telescope at the visitors center on Maunakea. It will be installed in a location that will not interfere with cultural practices or obstruct the summit. While UH students have some time on other telescopes on Maunakea, a small UH run telescope dedicated to UH students along with high schools, WCC, and amateur astronomers is logical as the current teaching telescope is to be decommissioned in 2023.	A, K
290	I am fully supportive of locating the educational telescope at Halepohaku.	
292	I am wholeheartedly in favor of the new 28-inch educational telescope at Hale Pohaku. It will be a great benefit to the students, the university and the community.	A, B, C
294	I support the new 28-inch educational telescope at Hale Pohaku in order to advance education at our university. It is good for the students, the college and the community.	A, B, C

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
297	<p>I think placing this facility at HP is such an obviously good idea that it's a great pity that it wasn't done 10 years ago or more. The lost educational opportunity is immense. I hope this can be done: full support.</p> <p>I can't remember commenting previously - if you find two comments with my name on them, please discount one (and I hope they say the same thing!).</p>	K
300	<p>Aloha mai kakou,</p> <p>I am writing in support of this project from what I know so far. I'm not sure about objections to the site and respect of views of other Kanaka Maoli regarding Hale Pohaku. As a graduate of UH Manoa (PhD in Geography 2007), former Assistant Professor of Geography at UH Hilo (2007-2009), and currently Associate Professor of Hawaiian Studies at BYU-Hawaii (2009-present), I believe that decommissioning on the summit and providing this telescope for UH-Hilo students, faculty, and the community at Hale Pohaku seems to be pono. Again, I would stress that decision makers listen to and respect the concerns of Kanaka Maoli in general, but especially those with specific kuleana regarding Mauna Kea and Hale Pohaku should be given due respect and consideration. As a member of the Oahu Island Burial Council representing my home district of Ko'olauloa, we defer to 'ohana and community members and their kuleana to specific spaces and places and out of respect to kanaka with deep connections to Mauna Kea, I am coming late to the discussion from another island, but from what I know this project sounds pono to me and an opportunity to balance science and culture.</p> <p>Mahalo nui</p>	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
301	<p>Aloha members of the Board of Regents,</p> <p>The Hawai'i Island Chamber of Commerce, formed in 1898 by the business community of the Island of Hawai'i has continued to be a dedicated supporter of the scientific and particularly astronomical enterprises on Maunakea. Nearly 300 members strong, our chamber members represent both large and small businesses, professionals and non-profit organizations.</p> <p>We support the proposed relocation of the University of Hawaii's teaching telescope to a site at Halepōhaku for the following reasons:</p> <ul style="list-style-type: none"> <li>• We recognize Maunakea for its cultural and scientific significance and must be thoughtful of how the area is utilized. The new telescope will be supported by existing infrastructure at Halepōhaku and connected to an existing building.</li> <li>• Having this teaching telescope at the mid-level facility will allow more Hawai'i K-12 students to participate in astronomy research who would not be able to do so at the summit of the mountain.</li> <li>• Making this opportunity available for students and our community would support Maunakea's world-class status and efforts in astronomical studies.</li> <li>• The new location is ideal to its proximity to UH Hilo.</li> </ul> <p>Thank you for this opportunity to express our support for this effort. As many would agree, a "hands-on" experience would enhance a "classroom" experience and better prepare our students training in astronomical observing techniques, scientific research and similar fields.</p>	A, B, C, K
304	<p>I believe HPP is a wonderful location for the teaching telescope. As a student, I know I would be more prepared for a future career if I had hands on experience operating the student telescope. The observatories have given myself, and others hope that we will be able to have wonderful jobs in our field, and continue to stay in Hawaii. If the university is allowed to provide equipment like the teaching telescope, then students are better prepared to get these technical positions, and in the long run this will allow more people in our community to learn about astronomy, and the instrumentation.</p>	A, C, K
305	<p>Aloha -</p> <p>I strongly support the proposed UH Teaching Telescope at Halepohaku for the many benefits that are already well-know.</p> <p>I believe it does not interfere with the cultural aspect of MaunaKea as it is a small structure in an area that is already developed.</p>	
306	<p>I think this will be great for our community and educational programs. It's good to hear that there will be a facility that can be used by our students.</p>	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
309	I am in complete support of the telescope and proposed site, and see no compelling reason why anyone would object to a project that can only help the educational quality of our state.	A
311	Aloha,  I'm 100% behind hale Pōhaku. We should give students world class opportunities like this whenever possible. There's no reason for this to be controversial as it's not disturbing anything and will give UH Hilo students a huge advantage in their studies of astronomy.	A
312	<p>The Kona-Kohala Chamber of Commerce is a 501(c)(6) non-profit organization with nearly 500 member businesses that represent a wide range of industries in the private, non-profit and public sectors in the Kona and Kohala districts on the west side of the island of Hawai'i. Our mission is to provide leadership and advocacy for a successful business environment in our region.</p> <p>For many years, our Chamber has strongly supported the astronomy industry on Maunakea noting significant scientific discovery, global leadership, educational outreach, workforce pipelines, jobs and economic impact.</p> <p>We support a new UH Hilo educational telescope atop Maunakea to provide hands-on student learning, research opportunities and skill development. Hawai'i's future generations will benefit from this new telescope and the programs will enhance STEM education and workforce development for Hawai'i's 21st century jobs and careers. We recognize that Maunakea is one of the best locations in the world to study the stars and this new educational telescope will recapture UH Hilo's niche as a competitive astronomy program.</p>	A, B
314	I am a supporter of providing our students with the best educational experience that we can possibly provide them. And having access to an educational telescope will provide astronomy students with more viewing time as well as the practical experience of directly with the equipment, an enhancement to their academic studies. The proposed site is currently used to store equipment so there shouldn't be any issues with respect to sensitive archeological sites. The proposed project makes a lot of sense to me.	A, K
316	Our organization supports placing the UH Hilo Educational Telescope at Halepohaku as it will provide access to a one-of-a-kind resource not just for students of UH Hilo, but also for all of the K-12 students of Hawai'i Island.	A
317	Aloha members of the Board of Regents,	A, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
	<p>I am writing as a lifeline resident of the Big Island and the dad of 2 school-aged girls and 1 college student in strong support of moving the Hokukea Teaching Telescope to Hale Pohaku. I am sure many others are addressing the sensitive issue of whether Hokukea should remain on the summit of Mauna Kea. I will leave that discussion to others and write my comment in support of educational opportunities for our children.</p> <p>My ancestors arrived in the Kingdom of Hawaii, starting in 1890 to work in the sugar plantations. The Hawaii they arrived in was still under the reign of King Kalakaua, who was a big supporter of science and astronomy as he looked for ways to modernize Hawaii. I am sure they would have marveled at the tremendous advances in science and astronomy here on Hawaii Island. Who could have guessed that in 2020, a Hilo High graduate would win the Nobel Prize in Chemistry (Dr. Jennifer A. Doudna) AND longtime W.M. Keck Observatory astronomer, Dr. Andrea Ghez, would win the Nobel Prize in Physics for her research on black holes made on the Keck Observatory on Mauna Kea? It is an exciting time for science and astronomy here on the Big Island. It only makes sense that we continue to support science and astronomy programs like Hokukea that can stir the imaginations of our keiki to be become the scientists and Nobel Prize winners of the future.</p> <p>Relocating Hokukea to Hale Pohaku will make it more accessible to EVERYONE. Young children are not allowed to visit the summit of Mauna Kea. By putting this teaching telescope at the mid-level facility at Hale Pohaku, it will be possible for everyone - young and old, people who have 4WD and those who do not - to learn first-hand astronomy at the visitor center. I do not know whether my daughters will go into astronomy or other STEM fields. I DO believe that we owe it to them to develop the tools locally that will allow our children every opportunity to learn and develop their skills in the STEM fields.</p> <p>I strongly support moving Hokukea to Hale Pohaku.</p>	
319	I support this project relative to the UH Hilo Educational Telescope. The students need it and the location makes senses on several levels.	A, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
320	<p>I support the proposed relocation of the University of Hawaii’s teaching telescope to a site at Halepōhaku for the following reasons:</p> <p>1) The facility will be a unique educational experience for undergraduate students in Hawaii. While many undergraduate programs have small campus telescopes, few have a telescope so closely connected to a premier site. By placing the telescope at Halepohaku, the students will work in an environment along side the researchers/staff of the larger summit facilities. They will be part of and connected with that research and support community. That is a truly unique situation - no other US undergraduate program (or possibly in the world) have a teaching telescope so tightly integrated with a world-class astronomy community.</p> <p>2) It enables this unique educational facility at a site that has excellent existing infrastructure, excellent personnel/facility support, and is a safe location for the students to work at. This allows the students to obtain the critical hands-on experience with the facility that leads to a deeper understanding of all aspects of the learning experience - how the equipment works, how the data is obtained, and what conclusions can be drawn from the data.</p> <p>3) It enables the possibility for extending the use/access to the telescope to a larger educational community in Hawaii (e.g. K-12).</p> <p>Thank you for this opportunity to express my support for this effort.</p>	A, C, K
321	Support Astronomical learning and opportunity on the Big Island and State of Hawaii	A

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
322	<p>I support the proposed relocation of the University of Hawaii’s teaching telescope to a site at Halepōhaku for the following reasons:</p> <ul style="list-style-type: none"><li>• I recognize Maunakea for its cultural and scientific significance and must be thoughtful of how the area is utilized. The new telescope will be supported by existing infrastructure at Halepōhaku and connected to an existing building.</li><li>• Having this teaching telescope at the mid-level facility will allow more Hawai’i K-12 students to participate in astronomy research who would not be able to do so at the summit of the mountain.</li><li>• Making this opportunity available for students and our community would support Maunakea’s world-class status and efforts in astronomical studies.</li><li>• The new location is ideal to its proximity to UH Hilo.</li></ul> <p>Thank you for this opportunity to express my support for the telescope. thank you</p>	A, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
323	<p>Aloha!</p> <p>Thank you for the opportunity to provide community feedback!</p> <p>I support the building of this improved, up to date educational telescope. I am very happy that it will be available to members of the community.</p> <p>Many reasons exist for my support. I live on Oahu, and my family has lived in Hawaii for many generations. I look forward to being able to travel at some point in the future, and being able to take my nine year-old son to look through the telescope. I like to visit the Big Island, especially when international friends visit. I also look forward to looking through the telescope as a shared experience with them. I am very proud that Hawaii is one of the best places in the world because of its astronomers and telescopes (it feels good every time I hear a news report about a discovery being linked to our telescopes and astronomers). Perhaps one day the Hawaii telescopes will contribute to saving our planet by discovering a space-object hurtling on a path to impact Earth or our moon. Furthermore, star-gazing appears to be a "clean" activity that does not create much pollution. Moreover, because the ancient Hawaiians discovered these islands by studying the stars, because King Kalakaua was such of lover and adopter of far-off travel (he travelled the world) and the best in technology (eg, he met Edison and obtained electric lights at Iolani Palace and surrounding streets), and because of the Island's unique global position and unique mountain, it makes sense to me implement the best star-studying technology and vocational and educational opportunities in Hawaii. With such, we can feel good about continuing to be contributors and leaders in the world in discovery.</p> <p>I do recognize that many people are upset by telescopes a top Mauna Kea, and I do hope that the best telescopes (and educational and vocational opportunities) can be built a top Mauna Kea in a way that not only resolves any upset, but in a way that results in pride and more feelings of Aloha.</p> <p>Thank you for considering all of the community's viewpoints.</p> <p>I wish you the best of success!</p>	A, C
324	<p>Very good proposal! I support this decision for the creation of this telescope and mahalo for allowing it to be open to the public.</p>	C
326	<p>I support the proposed educational telescope to be built at Halepohaku. It is a convenient location to the support facilities there and offers opportunities for public outreach.</p>	C, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
328	I cannot say strongly enough how much I support and approve of the construction/locating of the UH Hilo Educational Telescope at Halepohaku. This telescope is a logical next step for correcting the non-functioning old UH telescope. The opportunity for students at UH Hilo to actually have telescope time as under graduates is so unique and career expanding. To deny this educational tool would be a crying shame! We owe it to the next generation of students to keep up with the times and continue to develop the tools and amenities for those attending UH Hilo. Thank you for the opportunity to strongly support this project! With sincere respect.	A, K
329	My husband and I support the construction of the proposed telescope on the summit of Mauna Loa. As residents of Hawaii Island we believe that this issue should take the perspective of the residents who live ON HAWAII ISLAND as the highest priority - not people from other islands or the mainland. We believe that this project provides an excellent learning opportunity of the students and future scientists attending the University. We hope that this telescope can be built and be available for scientists around the world to learn more about space.	A
330	I am a resident of the Big Island & feel the addition of the telescope to be used for education is greatly needed & would love to see it as a completed project!	A
331	<p>I am in favor of the proposed placement of the new teaching telescope at Halepohaku because</p> <p>(1) Students at UH Hilo and the rest of the UH system, and younger students on our island, need access to their own telescope; and,</p> <p>(2) This location is in an existing building, so it will not require disturbing any additional land on Mauna Kea.</p> <p>I am reminded of the story of Dr. Jennifer Doudna, who recently shared the 2020 Nobel Prize in Chemistry. A significant motivator in her path to excellence in her field was her access, while she was attending Hilo High School, to the electron microscope in Dr. Don Hemmes' biology lab at UH Hilo. I believe that access to a teaching telescope at UH Hilo could be a similar stimulus and inspiration for students at UH Hilo and the rest of the UH system, and younger students on our island.</p> <p>Thank you for the opportunity to comment</p>	A, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
335	I support the proposed telescope as it will provide opportunities to local students and our public. I've attended the outdoor presentation at the visitor (which is misspelled on your area map provided) center and it was very, very popular and also visited the Imiloa Astronomy Center, which is a valuable asset. As was discussed in astronomy presentations at both sites, the ancient Polynesians used the celestial bodies and events to navigate and I think that point was integrated well at both sites. I think having the telescope will only enhance our state's ties to that history and our future.	A, C
336	I support the installation of the new UH Hilo Educational Telescope at Halepohaku. Undergraduates and the community at UH deserve to have the hands-on experience that access to such a telescope would provide. Halepohaku, with its excellent seeing and proximity to the Maunakea Observatories, is an ideal location for the telescope.	A, K
339	I think the teaching telescope is a terrific idea and would be a tremendous benefit to the students of Hawaii.	A
340	I take astronomy courses regularly through the Na Kapuna program at UH Manoa, and would enthusiastically support the proposed new teaching telescope at UH Manoa. The astronomy program at UH is world class, one of the few areas where we really have an opportunity to expand our economy and high value employment opportunities for our students. We should do everthing we can to expand this effort.	A
341	I am in total. Support of the UHH Educational Telescope as it will enable further education of our youth on the Big Island.  Studies show the site of Halepohaku to be the best site for this telescope.  Please make this possible for ourKeiki  Aloha	A, K

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
344	<p>I have reviewed the University of Hawaii-Hilo’s documents regarding the UH-Hilo Educational Telescope’s potential siting at Hale Pohaku (HP).</p> <p>Provided that certain conditions are first met (described below in the Major Comment), I support the construction of this telescope.</p> <p>Major Comment:</p> <p>1. A small 0.7m telescope is not Keck or Subaru (or TMT) and what is essentially a non-descript area/parking lot by the HP dorms is not a summit cinder cone. Nevertheless, I understand and respect the viewpoint that the university should not yet construct a telescope anywhere on Mauna Kea without first removing the observatory it replaces (Hoku Ke’a).</p> <p>Hoku Ke’a has not been considered for use for many years; the Caltech Submillimeter Observatory was listed for future decommissioning in 2009 and ceased operations in 2015. Yet either structure has been fully removed and the decommissioning process does not project removal of both telescopes until 2023 (~a decade later). From the standpoint of many community members skeptical of observatories at all, UH’s plan to remove these structures is purely aspirational and the university’s recent trustworthiness on decommissioning is not backed by evidence.</p> <p>To put matters more bluntly, it is quite clear that many of those opposing TMT are likewise opposing this telescope. Among other things, they have complained about the lack of progress with decommissioning Hoku ke’a as evidence of broken trust. They have physically obstructed and delayed a fully permitted project (TMT). I would not want the same thing to happen to this telescope.</p> <p>Recommendation: I would strongly encourage the University of Hawaii-Hilo to tie the construction timeline for this telescope to the decommissioning timeline for Hoku ke’a. Once Hoku ke’a begins to be physically disassembled, I believe that the construction of its replacement should proceed.</p> <p>Other Comments:</p> <p>1. I strongly endorse UH-Hilo’s goal of training students for work in professional research observatories using this telescope. Precise execution of this plan is trickier.</p> <p>UH-Hilo should provide some documentation on exactly their plan for training students to work at the Mauna Kea observatories (e.g. CFHT, Subaru, Keck) using this telescope. For instance, how will students learn to plan and execute</p>	A, e, i

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
	<p>observing photometric and spectroscopic programs and exactly how would these experiences put UH-Hilo graduates at a significant competitive advantage for future telescope operator job openings over someone from the mainland?</p> <p>The telescope’s webpage mentions adaptive optics (AO) as a possibility with this telescope. AO is a major focus of multiple Mauna Kea observatories (e.g. Keck, Subaru). AO is also a key technological growth focus at the summit observatories (e.g. SCEXAO on Subaru; KPIC on Keck). UH-Hilo should describe how this telescope will provide opportunities for students to gain basic experience with AO operation, instrumentation and other instrumentation projects.</p> <p>To be most successful, it would be helpful for UH-Hilo to formally work with the current Mauna Kea observatories to ensure that the skills obtained with the educational telescope match those required for observatory jobs.</p> <p>2. The observatory schematic suggests that the only ground impact is set of platform footings 12” below grade and a single post 6 feet below grade. Aside from fixing these structures in place, the university confirms that there is no additional ground disturbance?</p> <p>3. Has the exact observatory area been ‘disturbed’ before, even temporarily? (e.g. graded, poured over with asphalt)</p> <p>4. Just to be clear, will operators of the telescope be required to undergo cultural training as must personnel at the summit observatories?</p>	
345	<p>Everything about this project is positively positive!! Great idea and we definitely should move forward with it! Good for our island, our young people, our economy, good for education, for our island's well-being!</p>	A, B
346	<p>Build it!</p>	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – SUPPORT NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
354	<p>Aloha,</p> <p>My name is (REDACTED); I live on Hawai'i Island and work as a telescope optics technician.</p> <p>I have spent years working at observatories and in public schools teaching people of all ages about the night sky through the use of telescopes like Hōkūke'a and the UH Hilo Educational Telescope. Telescopes are the tools we need to show people inspiring views of our universe that cannot be seen with the unaided eye: Saturn's rings, Jupiter's moons, our neighboring galaxies, stars being born, and stars at the end of their life cycle. I believe the children and students of Hawai'i deserve to see these marvels of our universe. In my career at observatories, I have witnessed first hand how valuable educational telescopes are for providing access to astronomy and science exposure to young people, students, and the public. Often, the best research telescopes in the world, like those on the summit of Maunakea, are used full-time by the science community and availability to these telescopes is limited for the public. As well, the summit of Maunakea is impossible for many to visit due to the health challenges of high elevation. Smaller or older telescopes are wonderfully useful as students can visit them regularly to learn how telescopes work, how to find and observe objects in the night sky, how to gather scientific data, how to write research papers, how to begin a career in astronomy or STEM, and how to be curious and inspired about our shared universe. Our communities need telescopes like the UH Hilo Educational Telescope. There are many observatories across the world that dedicate public observation areas to telescopes and constellation education and I believe Halepōhaku is the perfect location for Hawai'i to share its astronomical and cultural knowledge about the night sky with everyone.</p> <p>I am writing in support of the UH Hilo Educational Telescope siting at Halepōhaku. I believe this is the first step in creating a world-class education and outreach program at Halepōhaku. I hope UH Hilo takes the opportunity to create a new and improved approach to cultural and astronomical education at Halepōhaku with the relocation of Hōkūke'a. Hawai'i leads the world in astronomical research; it is time for us to invest in the public and lead the world in astronomical, cultural, and night sky education and outreach.</p> <p>Thank you for your time.</p>	A, C, K
355	<p>As a Kamaaina Volcano resident, myself and my family support the construction of the educational telescope which will benefit local residents and science itself. Our world is too important and too complex to not encourage education in the sciences. The same goes for TMT. I am a graduate of the UH system and sincerely wish that the educational opportunities for our Keiki are enhanced by the study of astronomy.</p>	A, C

# Appendix 4 – Comment Analysis

Table A3: Comments Opposing Project with Topic Codes

<b>COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU</b>		
<b>ID #</b>	<b>COMMENT</b>	<b>TOPIC CODE</b>
2	<p>I strongly DO NOT support this project. No telescopes should be built at Hale Pohaku!! No new telescopes on Mauna a Wakea!!</p> <p>What is required by law to happen is the decommissioning of the 3 telescopes that are set for decommissioning. Not planning on building any more telescopes!! Especially during a world wide PANDEMIC!</p> <p>NO TMT!! NO new telescopes built anywhere on Mauna a Wakea or Hawai'i nei.</p> <p>Please let me know where I can send comments in opposition to this horrible project.</p>	d
10	<p>Indigenous Hawaiians in the main do not want the TMT. Indigenous lands worldwide are more pristine than any others. I consider it a gross act of colonization to force TMT onto Mauna Kea. No good can come of it. My stepson was at UH, btw.</p>	e
12	<p>No more development on Mauna Kea. Tying decommissioning of Hoku Kea to the building of another telescope defeats the purpose of decommissioning. UH and all other interests on Mauna Kea need to understand that the lease is coming to it's end, it will not be renewed and, according to current lease terms, the summit and all developed areas must be restored to their conditions prior to all development on Mauna Kea. UH needs to plan the return of the mountain, not plan any further development. My 'ohana was privileged to stand with the kia'i (protectors) of Mauna A Wakea at the Mauna Kea Access Road (which belongs to DHHL and has never been properly addressed and the trust has never been compensated) for 9 months in 2019-2020. Tens of thousands, perhaps 100's of thousands, of people from all over the world came on pilgrimage to to our mauna. Do not mistake our aloha for weakness, we will continue to stand in peaceful protection of Mauna Kea and there will be no further severe, adverse and substantial degradation of the mauna. TMT will not be built and no new telescopes will be built. It is a non negotiable and a multi-generational issue. The kupuna who were arrested blocking TMT construction equipment from accessing the mountain represent a tiny fraction of those willing to stand in peaceful protection of Mauna A Wakea.</p>	d, e, f

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
15	<p>No more. No. A'ole! This farce needs to end. How long have the promises to decommission and REMOVE the opala been strung along and broken time after time?</p> <p>No More</p>	d
20	<p>A'ole to any new construction on mauna a Wakea. Go build your telescopes some place else; the UH and each of you interlopers is not welcome on the mauna.</p> <p>Tutu Pele is watching and she is going to take back more land...maybe the land where you left your ukana.</p>	d, e
21	<p>Do NOT build another telescope. We do NOT need any more telescopes on sacred mountains!</p>	d
24	<p>I am quite astounded that the University would propose to build yet another telescope on Mauna Kea. Have you heard nothing over the past years? What is it you do not yet understand? If the Mauna is sacred, leave it be. If the students need access to a telescope find a way to work with what remains among the many telescopes that have been built on the mountain rather than build something MORE.</p> <p>No, i do NOT support this project.</p>	d, e
26	<p>I oppose any further desecration of Mauna Kea</p>	d
27	<p>My initial thought is this is the wrong time to bring this up if you still think there is a chance for the thirty meter telescope winding up at the summit. Seems like fuel for the fire. Being a proponent for the thirty meter, I think the timing is really poor. Better idea is to make more use of the Faulkes telescope on Haleakala, originally built as an educational telescope for the students of England and for the lucky Hawaiian students as a windfall. The Faulkes is even located at a higher elevation and has a significantly larger diameter(3 meters) mirror than your proposed 28" telescope. From what I read the Faulkes telescope has become more of a research telescope in recent years and perhaps it can be reallocated for educational purposes. Better yet, put the 28" telescope on Haleakala. I bet there is a spot for it up there. It is certainly small enough.</p> <p>Just an amateur astronomers manao in the moment who loves to share the evening sky with anyone. The sun is pretty cool too!</p> <p>Thanks for your consideration and the opportunity to give input. (redacted), a Maui resident.</p>	J

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
28	Its disgraceful. How many concerns and cries did you ignore from the Hawaiiin people? That they did not want this telescope on their sacred mountain!! Instead of trying to explore space, how about you explore the planet you live on. Leave Mauna Kea alone.	d, e
29	To whom it may concern, A'ole to the building of a teaching telescope up on halepohaku. Quit desecrating, leave the mauna alone and find other options or places in other countries.	d, e
31	I think all buildings on the mountain should not be there. Funny how the government says its conservation land I would think a university know what that means and yet did not go by the laws on conservation.	g
38	"Utilization of Halepōhaku maintains UH Hilo's strong connection to Maunakea and its cultural and scientific significance."  First of all, cultural significance does N O T need colonizer science and destruction of the land for another building. There is no link between the two, so just. Don't.  Don't ask the public just because the native peoples continue to say NO. Just respect native sovereignty. Take the NO.	d, e
45	I don't think this telescope should be on the mauna at all, In the spirit of decommissioning the excessive number of telescopes already there. This plan is an abusive attempt at skirting around the issue and a further mismanagement of Mauna Kea.	d, h
51	Aloha kakou. It's not about education. It is about governmental stewardship of land. It is about respect of the host culture. Why can't Hawai'i students have access to existing telescopes? For the University to even suggest this is a slap in the face of all real Hawaiians. Ku Kla'i mauna	e, h
52	Aloha kakou. It's not about education. It is about governmental stewardship of land. It is about respect of the host culture. Why can't Hawai'i students have access to existing telescopes? For the University to even suggest this is a slap in the face of all real Hawaiians. Ku Kla'i mauna	
54	I am not for any more projects upon our mountain. There are many issues that needs to be resolved before moving forward with any projects. Mahalo for your time.	d
55	Please do not build on Mauna Kea at all. I oppose this proposal and project.	

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
56	<p>NO is NO.            No telescopes on Mauna Kea.            Decommission = remove.            Decommission does NOT mean remove + put somewhere else + on same sacred mountain + over same precious aquifer.            NO is NO.</p>	d
57	<p>Decommissioning the Hokuke Telescope means to disassemble and remove. That doesn't mean just move it down the mountain and reassemble or because one has been removed, that you should replace it. Show good faith and remove the decommissioned telescope totally off the mountain. It seems as though UH wants what it wants, but does not care about the Hawaiian Peoples Sacred Aina.</p>	d, e
59	<p>Please stop trying to add more telescopes on Mauna Kea. There are 13 telescopes already on Mauna kea, 5 of which in 2016 were labeled to be decommissioned but yet has never materialized. Stop polluting and desecrating the land. UH is suppose to be stewards of the land, but this does not seem to be the case. Telescope after telescope, with the promise this will be the last one, but it never is. When will it ever be enough?</p>	d, e, h
60	<p>I oppose this project in the ground that UH has telescope already on the mauna , many telescopes left to rot and wither away in the environment to be forgotten about. This is not right , continuous misuse of such a sacred and spiritual place is a poor use and disgusting over stepping of “ educational reasons”</p> <p>No more building ! Fix what you already have clean up what you have left behind hold these company’s &amp; scientist accountable for the desiccation of Mauna Kea .</p>	e, h
63	<p>'Aole TMT, 'aole UH. You have heard from Kanaka Maoli, No, the answer is no. This is not a teaching telescope, this is all for monetary gain, genocide and control. UH's attempt to allow foreign entities to be put in front of Kanaka Maoli's issues, spirituality and culture has come to an end. UH has proven to be a business to cultivate hate and discord while attempting to oppress the original people of the aina for money serving haole endeavors. This is not a necessity. Kanaka Maoli are a necessity. UH needs to step back and go elsewhere with this pointless telescope. Hawai'i said NO! NO TMT!!!</p>	e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
66	<p>The University of Hawaii has taken advantage of our Aloha long enough. Time to pay the piper. Aole ALL UH projects and their pilau haole staff</p> <p>Thats right I said pilau haoles the very ones who speak poorly of kanaka the very ones who are still professors even after blatantly calling Hawaiians dumb.</p> <p>UH will never have my support as long as they support pilau haole</p>	d
73	<p>I oppose the siting of the Hōkū Kea Telescope on Mauna Kea at Hale Pōhaku for the following reasons:</p> <ol style="list-style-type: none"> <li>1. There was a promise by President Lassner that no new telescopes would be built. There should be NO telescopes built anywhere on Mauna Kea, no matter the size.</li> <li>2. UH makes promises and never keeps them.</li> <li>3. The decommissioning process is stalled. There should be no development whatsoever until decommissioning process for 5 sites is completed.</li> <li>4. The proposed site is not designed or intended for a telescope - the size doesn't matter. The plan to open the facility for use by students and community will introduce even more traffic for this ecologically sensitive area. This is unacceptable.</li> <li>5. UH astronomy students should already have access to the 8 working observatories in the summit area and do not need this telescope.</li> <li>6. The Hōkū Kea telescope should be placed at 'Imiloa. That's what the facility is designed for.</li> </ol>	d, h, J, M, N
74	<p>I do not support the construction of this telescope. During such this time when the world witnessed the contention of the TMT, the consideration and proposal of this telescope, regardless of any and all justifications on how this will be responsibly built seems highly insensitive and offensive to the Native Hawaiian community. I strongly disagree with this proposal and do not and will not support this telescope.</p>	e
75	<p>Aloha,</p> <p>I cannot express to you how much it would mean to me and my fellow kānaka if UH would refrain from further construction on culturally sensitive and sacred places. It is my dream for Mauna Kea, one of the most special and sacred places for native Hawaiian people, to be protected from ALL FUTURE CONSTRUCTION ACTIVITIES, regardless of the educational importance of the structure. Perhaps this telescope can be located elsewhere on one of the UH campuses in a place that will not add to the overuse of Mauna Kea. Mahalo for your time and consideration. Ke aloha nō</p>	d, e, J

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
76	I do not agree with this development. These are sacred places to Hawaiian people, and developments like a telescope do NOT belong here.	d, e
77	I do not support any large telescope on the Mauna. It is an ecologically and culturally sensitive site, and development should not occur without full support of Native populations and without clear comprehensive plans for decommission. Adding a new telescope now would be grossly inappropriate.	e
78	I am opposed to this project. This mountain is sacred to Native Hawaiians. There are already telescopes on that Mauna that the government promised would be taken care of when decommissioned. Let's work on that instead of this project. There are alternate sites for this project. Haven't we done enough to the Native Hawaiians? I am a researcher who values science but this is unconscionable. We as Americans are better than this. Please do not approve this project.	e, i
79	Aloha,  My name is [REDACTED] and I oppose the relocation of this telescope. It should be decommissioned and removed in it's entirety as opposed to desecrating and impacting another area. DECOMMISSIONED AND REMOVED.  Mahalo nui	e
80	There shall be no more telescopes developed on Mauna Kea. 'Aole Pau.  Listen to the community and head our cries.	d

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
82	<p>Absolutely not! Do not move forward with this project! It is beyond inappropriate to even be suggesting this at this time, if ever. I am extremely disappointed to see the University of Hawai'i suggesting this after everything the kanaka maoli, over the entire pae 'Āina, have done to stand to protect MaunaKea. It is infuriating that such a sacred spiritual place in the world is continuously attacked and threatened by individuals and institutions that seriously have no real grip on the current state of affairs in the world to be focusing on, what exactly? Is it something that will save the human race in the next 30-50 years? Please change your roll in humanity. How about you all do more in restoration instead. The destruction to the Hawai'ian culture, land, and life ways has been astronomical in the last 100 years. How about with your Hawai'i title you take responsibility for helping to repair and restore what can be?. Truly, you give the youth of tomorrow a thought you'll realize if you don't make the shift in this direction, surviving as educational leaders may become difficult. The generations coming care about the generations coming. I recommend doing so as well. Maybe one day our orbital telescopes will be enough for what we need to see of the universe we're in. Until then.... help protect the life here on Earth and do something about the serious problems we face in surviving as a species and in doing so help other species. Take your pick of environmental issues, maybe the coral reef, especially since Hawai'i is facing a mass coral extinction in the near future and oh our coral make up sum like 20% of Earth's oxygen. If you're going to bring students from outside the island chain require a Hawaiian culture class and have classes that teach how to protect and respect the land there. So much about trying to build another telescope on the Mauna is garbage and I have so so many Words about it, but I think you get my drift. Please, open your heart and do the right thing, reject this project!!!</p>	e
83	<p>Enough is enough! Please immediately discontinue all projects to build telescopes that the people have opposed.</p>	d
84	<p>I am against all ALL desecration on Maunakea. You have no right to dig into Maunakea.            No consent.            No title.            No treaty.            No more desecration on Maunakea.            Side does not matter.            No</p>	d,e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
85	I think the learning telescope would be more utilized down near the University the skies are very clear and I'm sure it would do just as for all the students it would cost a lot of time and extra money to travel up-and-down the Mana having classes in the telescope plus this is a sacred gland and it should not be desecrated anymore	d, e, J
86	I oppose the construction of anything further on Mauna Kea. The University of Hawaii in particular to this day has not demonstrated any evidence that they (you) have the ability to hold up your end of the bargain. There's talk about decommissioning but no action; none whatsoever. How arrogant you are to even discuss further building when you have not even started to take anything down, and frankly this lack of action is reprehensible!	d, h
87	Do not put the telescope on sacred and ecologically sensitive land!!!! It is disrespectful and will draw more tourists, this further damaging the ecology. Please do not do this. It is not right. Science is amazing and beautiful but not when it is at the cost of human dignity and natural life.	e, N
88	Please stop developing on Mauna Kea. You have gotten away with mismanaging Mauna Kea for decades, you have continued to shown your mismanagement in the current events.  Please return crowned lands to the right heirs and stop advancing desecrating science.	d, h
89	Please stop developing on Mauna Kea. You have gotten away with mismanaging Mauna Kea for decades, you have continued to shown your mismanagement in the current events.  Please return crowned lands to the right heirs and stop advancing desecrating science.	
90	As a kupuna, I strongly oppose the further building on Maunakea. When will enough be enough? The University of Hawaii has already proven they are not capable of sound management for our mauna. There has been nothing but lies, misuse and mistrust. Enough! It matters not of any decommissioning. I strongly oppose your building.	d, e, h
91	As a kupuna, I strongly oppose the further building on Maunakea. When will enough be enough? The University of Hawaii has already proven they are not capable of sound management for our mauna. There has been nothing but lies, misuse and mistrust. Enough! It matters not of any decommissioning. I strongly oppose your building.	
92	Respecting the Mauna is first and foremost! No more developing!!!!	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
93	<p>Aloha,</p> <p>I strongly oppose the building of this telescope. As we all know, Maunakea is an ecologically sensitive area that has been highly mismanaged for decades. A proposed project like this will attract even more people to Maunakea’s already fragile ecosystem.</p> <p>Even if you don’t take the sensitive nature of the area into consideration (which you should), the promised decommission process on the Mauna is grossly delayed and there’s no clear path in sight.</p> <p>Last, but certainly not least, absolutely no more development should take place on Maunakea, period.</p> <p>Mahalo for your time</p>	d, e, h, l, M, N
94	<p>Aloha mai kākou,</p> <p>I am writing to you today to make in known that I strongly oppose the development of this new telescope. Maunakea is an ecologically sensitive area that has been highly mismanaged for decades. A proposed project like this will attract even more people to Maunakea’s already fragile ecosystem.</p> <p>Even if you don’t take the sensitive nature of the area into consideration (which you should), the promised decommission process on the Mauna is grossly delayed.</p> <p>Last, but certainly not least, absolutely no more development should take place on Maunakea.</p> <p>Mahalo</p>	d, e, h, i M,N
95	<p>Aloha,</p> <p>My ohana and I strongly oppose the building of this telescope. As we all know, Maunakea is an ecologically sensitive area that has been highly mismanaged for decades. A proposed project like this will attract even more people to Maunakea’s already fragile ecosystem.</p> <p>Even if you don’t take the sensitive nature of the area into consideration (which you should), the promised decommission process on the Mauna is grossly delayed and there’s no clear path in sight.</p> <p>Last, but certainly not least, absolutely no more development should take place on Maunakea, period.</p> <p>Mahalo</p>	d, e, h, i, M, N
96	No Tmt ever, it's our eternal temple and sacred	

# Appendix 4 – Comment Analysis

<b>COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU</b>		
<b>ID #</b>	<b>COMMENT</b>	<b>TOPIC CODE</b>
97	I oppose building/relocating of any facilities on Mauna Kea until such time that it can be proven that there is a treaty of annexation also you have infringed on my native tenant rights as a Hawaiian subject and protected person under international and Hawaiian Kingdom law.	e
99	Please build this in another location. It sounds like an amazing telescope but Mauna Kea is not the place for it. The land belongs to the Hawaiian people, who have made it very clear that they respectfully decline construction up there. The people of Mauna Kea are not going to grow tired nor become silent. Please look into your hearts and try and understand the weight of your actions and move forward with compassion. I understand you want to build there, that the government has said yes, but just because a person can do something doesn't mean they should. Even if you find what you are searching for, the manner in how you got there will not be forgotten. To make such amazing machines you must be very intelligent, so I am sure building the TMT on the Carrniy Island is achievable and any technical issues will be simple fix for you. The moral issues the TMT faces on Mauna Kea are only fixable by letting her go. Thank you for your time.	e, J
100	Please stop desecrating the aina. This project will not happen. Mahalo	d, e
101	I am strongly opposed to development at Halepōhaku. No more development should take place anywhere on the Mauna without the express permission of the Native Hawaiians whose land it is - and express permission must be given by a majority of Native Hawaiians throughout Hawai'i and the diaspora. Furthermore, UH and partner plans for telescope decommissioning have already fallen behind schedule and it is not clear when the process will resume. This shows bad faith on the part of the University.	d, e, i
102	Please stop all development on Mauna Kea especially any more telescopes. It is wrong that the university continues to propose additional structures.	d
103	I wholeheartedly OPPOSE the use of sacred land to build another telescope. There has to be a point where you realize that this earth is all we have and we should be preserving it. We need to take care of what we come from and that is this earth. The Kanaka Maoli are attached to this land. It is our Aina it is our life's blood. Take your telescopes elsewhere.	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
104	As a kanaka Maoli I do not support the building of this or any telescope on top of Maunakea. Humans should be focused on protect, restoring and taking of this planet rather than trying to find another one to go and ruin in outer space. Stop spending money on building more telescopes and start taking down all your decommissioned telescopes like you are supposed to. Maunakea is a sensitive ecosystem and a sacred space. Who does the telescope benefit besides those select few in college and studying astronomy? What native Hawaiians does building the telescope help? Stop thinking with your wallet, and how much money you can make.	d, i
105	This land is sacred, ecologically sensitive and we need to respect that. Please put people, and the future of the land before profits.	e, N
106	The Mauna is sacred to many. Please do the right thing and respect native lands by not continuing development	d, e
107	Please reconsider where you are building. This is sacred land, and the people of Hawai'i have given enough. Respect the people and the land and do not put anything else on Maunakea. Worldwide people are tired of putting profits over people and this looks extremely bad for the school to be so disrespectful; it will not increase attendance as you hope-but likely have the opposite effect.	d, e
108	As a Kanaka Maoli I am against this project for a telescope or any telescope for that matter. 13 was enough and I believe we as the stewards of these islands it's our birth right to protect it from further desecration and you people just don't get it! This is our homeland and that mauna is one of the most sacred places in our islands. Is nothing sacred to you? We implore you to cancel this project once and for all or you will have all of us back at the base of the mountain and we will not compromise or waver. You will never be welcome to build up there ever again. We will stand no matter how long it takes us for you people to get it. End the project and stop wasting your time.	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
109	<p>I have heard these empty promises before. What is the timeline for dismantling and taking all signs of Hokuke’a off of Maunakea. You can’t decommission that telescope and leave it to pollute Maunakea.</p> <p>I am also in opposition to retrofitting Hale Pohaku because I know that UH will have to bring in heavy machinery to dig trenches and level the land in areas, they will also demolish walls, floors, ceilings and roofs to bring everything up to code. There will still be a negative impact on the fragile ecosystem on Maunakea. UH is still mismanaging Maunakea and lying to the public regarding the ecological impact all of the buildings and telescopes and chemicals used to clean the telescopes, etc. are having on the Maunakea. There should not be anymore building on Maunakea. Mahalo</p>	d, e, h, i, N
110	<p>I think the mauna should not be developed upon, the land is a sensitive eco-system that needs protection from any building, or development. Learning about the land, and its needs should be a priority before the building of a telescope. Protection of eco-systems and mountains is of great importance and no more development should be allowed on the mauna.</p>	d, N
111	<p>I APPOSE TO THIS... We really dont need more telescopes up on The Mauna. The University of Hawaii miss manage this for years. NO MORE!!!</p>	d, h
112	<p>The desecration of sacred ancestral lands shall be no more, this area is severely damaged ecologically and this site will attract even more damage.</p>	d, e, N
113	<p>There should be no further development on Mauna Kea. Irreparable damage and irreversible adverse effects have plagued her plateaus for years with no reconciliation- why deepen the wound? The mountain herself has said “no”, and “no” should be enough reason to stop.</p>	d

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
114	<p>No further development should take place anywhere on the Mauna; this is an ecologically (and by extension, culturally) sensitive area and these plans will presumably attract even more people to this area. Respectful or otherwise, this can only cause further environmental damage.</p> <p>Is it not ironic to believe in education and the future and to have concluded that plans that would damage and desecrate is a good and beneficial use of resources and something we should be inspiring future innovators with? That there may be few sites left (or perhaps merely convenient) to conduct this work surely is motivation to be engaged chiefly in conservation and protection of our planet.</p> <p>The promised decommission on this site is also slow and if I understand correctly, already overdue from 2015. It is problematic that there seems to be little detail as to how and when this will take place.</p>	d, e, i, N
115	I oppose any and all telescopes upon and around Mauna Kea	d
116	<p>I am in opposition to sitting the Hōkūke'a telescope at Halepōhaku. There should be no more development taking place on Manua Kea. The promised decommissioning process must be a priority and should happen quickly and efficiently. At the moment the decommissioning process is delayed with no clear path. This proposal will attract more people to this ecologically sensitive area. The scientific community, of all communities, should respect and honour the need to protect the integrity of sensitive ecological areas above all else as we move further and further into the chaos of climate change. Additionally, Manua Kea is sacred land and the desires and wishes of Native Hawaiians must be respected. The illegal annexation of Hawai'i in 1898 has led to decades of invasion and disrespect towards Kanaka Maoli's and their land. This stops now. All development on Mauna Kea must cease and desist immediately.</p>	d, i, M, N

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
117	I write in petition against further development, for any organization or institution, on or around the summit of Mauna Kea. As UHH Alumni from the university's Anthropology Department, with my focus in Pacific Island Cultural Studies, I understand the cultural implications of development in this location as well as the lasting damage of previous development. Additionally, a previous major and professional career in mental healthcare as a case manager and direct care provider, informs me that ancestral cultural traumas have serious social and psychological consequences for communities and individuals. One's sense of belonging, having a sense of valued existence, and feeling safe are basic expectations for protecting individual mental health. On top of these, are the deeper values of environmental protections, which are also familial and spiritual protections. People of Hawai'i have internal values (connection, security) that are externally expressed within the environment. The mountain isn't a place outside of a person, it is a person—an entity—that is related to, connected to, and vital to one's social and emotional health. Please consider the long term social-emotional consequences of continued construction atop one of the most spiritually significant entities in the Hawaiian archipelago, before any decisions are made.	d, e, O
118	Enough.	
119	I'm glad this project isn't being proposed for the summit of Maunakea, but why contribute to any further desecration of the Mauna? I recognize the importance of proximity to campus and the information this telescope will help you gather, but is it worth it for the damage it'll inevitably cause?	
120	No more development should take place anywhere on the Mauna. It is sacred land. This proposal will attract even more people to this ecologically sensitive area.	d, e, M
121	I don't believe there should be any more telescopes added to Mauna kea. I believe you can make modifications to the ones that already exist and move forward on the decommissioning of the ones promised. Instead of investing in the education in regards to what's happening in space, invest in the preservation of Hawaiian culture and land. Many of the agreements set with the University of Hawaii have been broken in regards to what happens on the mountain.	d, h, J
122	The production of this telescope and any other projects on Mauna needs to end immediately.	d

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
123	<p>Aloha mai tatou</p> <p>I am writting to share my mana'o to this project proposed at hale pohaku. I am opposed to any telescopes to be built on the mountain of Mauna a Wākea, Mauna Kea or Mauna loa for any reason. A'ole means just that NO! NO IS NO to any telescope(s) to be built on our mountains in Hawai'i Nei.</p> <p>We the people do not want any more telescopes built. Decomposition is pending to still take place for the telescope's that are suppose to be removed. With many unpromising options not completed as stated that it would be. Drilling will also ruin the sacred lands. These are reasons we do not agree with this project.</p>	d, e, i
124	<p>No consent. No construction. No telescope. This project desecrates sacred Hawaiian land and abuses the Hawaiian constitution as well as indigenous rights. As much as I love science and astronomy and want this project to exist somewhere in the world, it cannot be built on Maunakea. This is another act in a long history of stealing Hawaiian freedom, rights and land—if this continues, it will be an act of supporting further desecration of Hawaiian culture, people, and land that will not stop until there is no one left. Thank you for your consideration of these sincere concerns and plea to abide by the people.</p>	d,e
125	<p>I completely do NOT support any futher desecration and/or development of any kind on Mauna Kea. The mounatin is important to the Hawaiian people and we should have complete say with what happens to our land. Please no more building anything on Mauna Kea, no ifs, ands, or buts. Mahalo!</p>	d, e
126	<p>The fact that there has been continued attempts for this project after explicit denial from indigenous leaders and community organizations is deeply harmful.</p> <p>This project risks bringing more tourists and requires excavation and other disruption of sacred and valuable natural land.</p> <p>There is no compromise.</p>	d M, O

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
127	<p>What you seek through the telescopes is delusion of grandeur and superiority aka white supremacy and capitalism. This desire to understand the stars, these oxygen-less + water-less phenomenons as we burn our earth on purpose through the industrial complex obsession and war. Why are we compromising the health of the Hawaiian people more? — as if illegal occupation, exploitation and erasure of our culture, land, and language wasn't enough the past 300 years. I want to see big money and this kind of initiative to go towards protecting us from a global pandemic, end being exploited as a america's war playground, to rebuild all of our ahū'pua'as everywhere, to empower our youth through education and art programs. This whole business plan is poison. This relentless normalized dehumanization and violence for profit is disgusting, not progressive, not healthy, not smart, not Hawaiian, and definitely not Aloha. All of you who work for money, ego and power hoarding in the name of white supremacy are on the wrong side of history — your ability to hold on tighter to this fantasy as the reality of the people of Hawai'i is violated, disrespected and poisoned. Hawaiians already know the sacred relationship with stars, but y'all don't pay attention — just like all the colonizers that got lost at sea — you didn't "discover" anything. We were already here, we already knew the stars then, way before this pretending to understand the stars through your expensive toys that damage the earth, job titles of false hierarchies and delusional superiority. Leave Mauna Kea in peace. Leave Hawai'i in peace. KUA'AINA</p>	d, e
128	<p>You are acting as an oppressor with your proposal. You are on the wrong side of history as an oppressor of Indigenous rights, Indigenous sovereignty, and respect for what is sacred . The mauna should not be desecrated any more. Desecration in the name of science and money is SHAMEFUL. You should be an advocate for kanaka maoli, not an advocate of greed.</p>	d, e
129	<p>Use a different site for your telescope. Stop destroying sacred land.</p>	e, J
130	<p>No new telescopes should be built on the Mauna until the old ones are decommissioned as promised, and the mismanagement of the Mauna by UH is dealt with.</p>	h, i
131	<p>No more development should take place anywhere on the Mauna. The promised decommissioning process is grossly delayed with no clear path in sight. This proposal will attract even more people to this ecologically sensitive area</p>	d, M

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
132	No more telescopes of construction should happen on the Mauna. TMT wasn't welcomed and nor is this new telescope. Regardless of student studies, other ways should be discovered that do not include the desecration of any land! I wish for this telescope to NOT BE BUILT!	d, e
133	I oppose the telescope at halepohaku. There are more than enough telescopes in Hawaii. When is the fake state going to listen to the native people? I hope sooner than later. Mahalo	d
134	I am against further development on Mauna Kea. All projected developments face public distrust. Telescopes still stand to this day that are obsolete and unusable. They have not been decommissioned as promised and removed off the site. The University of Hawai'i & DLNR Continue to fail us & poorly mismanage it's lands specifically , Mauna Kea. If this telescope is so small and of great use why not decommission, dismantle , remove the rest of the telescopes ? This is another Trojan Horse and Natives throughout the world learned to travel and connect without the use of telescopes. This telescope will not truly be of use and education for all. I see this as another egregious desperate attempt to again allow outside investors to have some control and say over lands that are not theirs to oversee. We have been lied to constantly throughout our history here in Hawai'i. We have endured enough. 'A'ole to this telescope "Hökūle'a". Another thing there is Hökūle'a the world wide voyaging wa'a and Hökūle'a the zenith Star. Don't even try to use our names of significant movements to try to get us to support this. Again. Egregious and quite outdated your methods of using our culture in a way that to gain our support.	d, e, h, i
135	Stop desecrating our as sacred Maunakea. We do not need any NEW telescopes and ALL telescopes need to be decommissioned, removed from our Mauna and leave her alone. Nothing should have ever been on top of our Crown lands and Mauna a wākea is sacred beyond your need for "educational science" Go someplace else to build your telelescopes, because desecrating is not an education. Kū Kia'i Mauna!	d, e
136	No more development should take place on Mauna Kea.	d
137	I am making this comment, along with many others, against a telescope to be built on sacred lands.	d, e
138	Please do not build this telescope. Please leave the Hawaiian natives and their land alone. Find somewhere else to build. Please.	d, e
139	No more development! No more telescope projects on the mauna! We only have so much left	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
140	Constructing anymore structure regardless of their use shows a blatant disrespect to the native Hawaiians and shouldn't be done. It follows the awful history of colonizing and disregard to native cultures who deserve to have their sacred places preserved.	d, e
141	No more development should be done on Maunakea	d
142	No more developments on the Mauna! Come on! Have respect and reverence for the mythology and ecology of native Hawaiians instead of dollar signs for eyes.	d, e
143	No more desecration on the Mauna! No more buildings, storage sheds, bathrooms— nothing! Decomission what's up there. And leave it as natural as can be considering all the damage you have already done.	d, e
145	Hui kuli pepeiao! Aloha nō ka maopopo 'ole, ke aloha 'ole o kahi malihini. 'A'ole!! No means no! 'A'ole means no! No I do not support this, you, them, this hūpō relocating of something that should be decommissioned and not put in place at all. You get a big N! For No and Nails. You get F & U. This solution is toxic and making me mentally, physically and emotionally sick. As a Hawaiian and someone who has uncommon common sense, just take everything off the mauna and leave.	d, e
146	Do not use the summit as a location for the telescope. Leave sacred areas alone!	d
147	Please stop using Hawaiian lands for the development of science. These lands have been stolen, and every time you build and develop, you are furthering that same colonization.	d, e
148	Please do not build yet another Telescope in this area. This area is ecologically sensitive and the planned construction would be hugely disruptive to the flora and fauna found there.  It is also sacred to the native Hawaiian people and should be left un - disturbed.	d, e, N
149	No more development should take place anywhere on the Mauna. Not only will this proposal attract even more people to this ecologically sensitive area, which is in itself incredibly irresponsible and disrespectful, but it contributes to the continued marginalization and colonization that has plagued Hawai'i for generations. It is unconscionable.	d, e, N
150	Please do not destroy the natural beauty of the mountainside.	N
151	DO NOT develop more on our Mauna. Enough is enough. We do not want it here. The ecological system is already fragile. We already have telescopes there that do not belong. We do not want nor need it there. Stop desecrating our 'āina. Enough is enough!!!!	d, e, N

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
152	Aloha I oppose this project being built on the Mauna because our land has been desecrated enough. Our Mauna holds a lot of mana to the Hawaiian people and it provided a safe place for us to practice our culture and heritage.	d, e
153	Please stop building telescopes and desecrating the mountain. I get it, youre doing it to pursue something you feel like you need to pursue, but this time just dont. Telescopes are cool and all but youre prioritizing whats up there in the stars more than whats here all around you, on earth. Please dont do this.	d, e
154	What is the point of more telescopes. Aren't there enough? Aren't you satisfied in your scientific colonization?? Why do you care more about space than the planet we are currently on why don't you care about the damage you are doing to the local ecology. I want to know. Maybe if Hawaii was focused more on its people than rich tourists the university would have higher enrollment maybe you should start beef with your local government instead of building telescopes.	
155	I think that giving education opportunities etc are important but you are proposing to destroy sacred lands, desecrate burial sites and quite frankly destroy history is egregious. It doesn't matter if it's the perfect place for it; native Hawaiians ancestors and heritage and culture are in that land. Shame.	d, e
156	I think it's time to stop desecrating Mauna Kea and listen to native Hawaiians who are telling you to stop. Century year old sacred sights don't need to be sacrificed so people can look at space.	d
157	I'm in strong opposition to a new telescope construction on Mauna Kea, ESPECIALLY before significant decommissioning of obsolete telescopes takes place. No.	d, i
158	No Telescopes on Halepōhaku! No Telescopes on Mauna Kea or any of our Mountains!!  Take them to another country!!!	d
159	Please consider the negative environmental and cultural impact this will have on an already traumatized land and people. No more development. Sacred spaces deserve to be kept sacred.	d, e, N
160	No telescope on any part of any of our mountains in the archipelago of Hawai'i.	d
161	I do not believe that any more development should take place on the Mauna. I, myself, am into astronomy, however, I do not support TMT or any more proposed development. I believe that there are so many other wonderful places to learn and study the stars, and places where this is not at the expense of destroying native, sacred land.	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
162	That gorgeous mountain belongs to the Native Hawaiians! There is already plenty of telescopes up there.	e
163	I am against putting this telescope here. This land is fragile and sacred. Please find somewhere else to put it.	e, J
164	Building this telescope will negatively impact the environment in this area, no more developments should take place on this sacred mountain.	d, e
165	As a Native Hawaiian, a Hawai'i Island resident, and an Indigenous scientist, I strongly oppose the building of the UHH Educational Telescope at Halepōhaku. The University of Hawai'i has been mismanaging the summit of Mauna Kea for decades. Absolutely no more telescopes should be built on Mauna Kea, and the University should remove decommissioned telescopes.	d, h, i
166	I strongly oppose the building of UUHET. No more telescopes should be built on Mauna Kea and the University of Hawai'i should remove the telescopes that have been decommissioned.	d, i
167	There should be no more construction on Mauna Kea. This land is sacred and adding another telescope to the dozen that are already up there is unnecessary. The local people of the Big Island and native Hawaiian activist voices should be listened to and direct how these efforts go.	d, e
169	Hi,  I am concerned with the construction of Halepōhaku as the issue surrounding the use of sacred land is still being discussed in regards to TMT. I do not approve of an additional structure without clear evidence that the older site is no longer of practical value for training. If Halepōhaku is for student learning, why does it even need to be on the mauna? Think about flight simulators and how students could train in a simulated environment using projected skies to learn tools and skills associated with astronomy. There needs to be culturally sensitive discussions about why the mauna needs to be the place Halepōhaku is built. I am not against scientific discovery, but am conscious of the long past of misplaced authority grabbing land for their benefit without considering the local population.	e
171	Mauna Kea is not a place for telescopes and /or to build any structure unrelated to the culture of kanaka maoli (hawaiian people). We have said this many times but it seems you (University of Hawaii) still don't get it. You are further hurting us Hawaiians and our sacred places. Please leave the Mauna and do your work somewhere else. Also, Haleakala is not an option too. Mahalo and please understand we stand for Aloha 'Āina and we will not stop as long as there is hewa and corruption in Hawaii.	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
173	I do NOT support the development of the Hokulea telescope. No further development should be made on Maunakea. Mismanagement of the area has gone on for far too long. The decommission of current telescopes is being grossly delayed and has no clear direction.	d, i
174	There are so many people expressing concerns about the impact of your proposed telescope on the environment and about how it would be incredibly disrespectful to all the people who have historically protected the land. The best science is based on a respect for people and nature and I hope you will keep these values in mind while looking at alternatives.	e, J, N
175	<p>Dear Sir/Ma'am,</p> <p>I hope this finds you well.</p> <p>While this telescope might be beneficial for expanding our knowledge in astronomy, I cannot help but see the continuation of taking over scared land that belong to the Native Hawaiians.</p> <p>It is a great displeasure to see that for the sake of expanding humankind's knowledge, the final result in order to achieve this is to erase another.</p> <p>Hawaiian culture is already becoming lost due to globalization. This sacred land is probably one of the few things they can have to keep their identity and preserve their own knowledge for future generations.</p> <p>It is certain that people might think this project might be for the greater good, especially for our future. However, there is no benefit for native Hawaiians in this case. The land that originally belongs to the native Hawaiians, is being used to support those outside that community instead of within.</p> <p>This telescope should be relocated to another area. Or not be built at all.</p>	e, J

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
176	<p>Aloha mai kākou,</p> <p>I am writing today in strong opposition to the construction of this telescope on Mauna Kea. Mauna Kea is sacred in Hawaiian culture, and any development on it is desecration. The Hawaiian community has repeatedly made our opposition to desecration heard. We are NOT anti-science. Our kūpuna were scientists, astronomers, voyagers, navigators, and such. However, they never allowed that curiosity of the unknown destroy sacred lands. There are already 13 telescopes atop that mountain. Most of these came with promises of decommission and removal, yet for each, there has been little movement in that process with no clear path in sight. Beyond the mountain's sacredness to Hawaiian culture, the environment is pristine. Not only will the construction of this telescope damage the environment, but it will attract more people to this ecologically sensitive area. I use my voice to strongly urge you to stop all proceedings regarding the construction of this telescope (and thus desecration) atop Mauna Kea. Mahalo.</p> <p>Me ka ha'aheo maoli</p>	e, i, M, N
177	<p>A new telescope should not be built on the mauna. The timeline for decommissioning the already existing telescopes is vague, and seems unlikely to actually occur. Additionally, the mauna is an ecologically sensitive area and the additional construction required and possible waste created by the telescope (like oil leaks which have happened before) could cause further environmental and ecological damage to an area that is meant to be protected.</p>	i, N
178	<p>This is unnecessary and so disrespectful to the native population who have already been opposing the Thirty Meter Telescope for months, if not years. There has already been far too much development of this scared land, and the decommissioning of telescopes no longer in use is a joke. To prioritize the educational competitiveness of the US over the well-being of the land and its people is actually pretty despicable, please stop this project.</p>	d, e, i

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
179	aloha, i have lived in hawaii for over ten years near pahoā. i hear daily from indigenous hawaiians about their feelings towards mauna kea, their sacred mountain. they do not want anything built there at all. it is sacred. please have at least a little respect for their situation, especially since you've colonized their sovereign county against their will, forcefully deposed their monarchy, forced them into european-style religion, tried to take away their language and barred them from huge sections of their own sacred aina. it is time to apologize. it is time to make peace. find another mountain somewheres that isnt sacred to anyone. have some kindness and respect. mankind has to learn to peacefully steward the aina, not forcefully impose his will upon the earth and nature.	d, e
180	Aloha  I am writing to oppose to this proposal for yet another telescope on Mauna Kea. Without even taking the time to address the mountain of concerns brought up for every single new telescope that has been proposed for the last 20+ years, you are proposing to build yet another one. Where is the decommission plan for all the telescopes and facilities already up there? Where is the environmental restoration plan for all the damage that has already been done? Have any of the requirements of the last two state audits been met? This is exactly how to not build trust with your community, by continually ignoring the concerns we bring up, and by continually trying to force new construction on the mauna. Absolutely not. No means no. Mahalo	d, e, i, N, O
181	I strongly oppose the building of the UHH Educational Telescope (Hōkūke‘a) at Halepōhaku.	
182	No construction on Mauna Kea means no construction on Mauna Kea, for all of the same reasons as before - all of the mountain is sacred to Native Hawai'ians, and the fragile ecology of the mountain will be disrupted by additional construction and tourist activity.	d, e, M, N
183	I do not support the building on Mauna Kea and believe UH should stop any additional construction, even for educational purposes.	d
186	No more development on the Mauna! I opposed to this telescope.	d

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
188	<p>Aloha,</p> <p>My name is [REDACTED] and I am a Non-Native Hawaiian resident of Kailua Kona. I am writing to express my strong opposition to the Hōkūkeʻa telescope's installation at Halepōhaku.</p> <p>First and foremost, I am disappointed and confused at the lack of follow-through on previously promised decommissioning of older telescopes. With no clear path forward, I am unwilling to trust UH's management atop Mauna Kea. To-date, this management has been inconsistent at best. Before there is discussion around any new telescope, when will the decommissioning work take place?</p> <p>Furthermore, the installation of a new telescope is sure to bring even more traffic to an already over-impacted, ecologically sensitive area. No more development should be carried out anywhere on the Mauna. UH repeatedly says they care about the ecology and culture, but their actions repeatedly betray these words. Before any further actions are taken, please address the issues long awaiting attention.</p> <p>Mahalo nui for your time.</p>	d, e, h, i, M, N
193	I oppose the construction of anything on the Mauna. It is a sacred site and against the wishes of the majority of the Hawaiian people. As an ecologically sensitive area it should be left alone.	d, e, N
194	I oppose the Hōkūkeʻa telescope at Halepōhaku. No more development should take place on the Mauna. This proposal will attract even more people to this ecologically sensitive area. Plus, the promised decommissioning on the Mauna is delayed with no clear path in sight. Please do not add any more telescope to the Mauna!	d, i, N

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
196	<p>DO NOT SUPPORT</p> <p>While an educational telescope to be used by UH students on the surface appears to be a good idea, the reasons that it should not be built are: 1) Nothing more should be built on Mauna Kea as nothing should have EVER been built there. UH has been a horrible steward of care on the Mauna. 2) To date, UH has not been trustworthy and though presents one path, actually goes another or further than what was agreed upon. 3) Right now UH is in severe financial budgetary issues, yet astronomy, a new director (\$\$\$) is being funded. How does one department hold more weight than another? There are many sciences doing great things. 4) Bells and whistles, promises of economy boosts to date have not come to fruition. 5) BOR meetings where hundreds go to express their opinion are ignored, we bet these comments will be too.</p>	d, h
197	<p>It is absolutely mindboggling and extremely angering to me how the powers that be continue to ignore the fact that they DO NOT have consent to build any more structures up on the Mauna. In the pursuit of "science", pro construction people are ignoring the very real science and reasons behind why we do not build on the Mauna. It is an ecologically sensitive area and there are many species of native plants that are only found up in that area.</p> <p>Modern science leads us to the conclusion that we are disturbing the biosphere, possibly irreversibly, with the way we are currently choosing to do things. Why, then, are we continuing to ignore indigenous wisdom and science surrounding the right ways to caretake these natural environments?</p>	d, e, N
202	<p>Aloha,</p> <p>I do not support the proposed UH Hilo Educational Telescope. Unfortunately I feel that UH is not listening to the community that has been voicing their opinion for over ten years now that, "There should be no further development on Mauna Kea"! While UH says that it understands and respects the values of aloha 'āina and mālama 'āina, little if anything has been done to prove that throughout the years they have held a lease for Mauna Kea. It is now time to let the community and Native Hawaiians heal from the gross negligence and lack of respect UH has shown for decades.</p> <p>I do not support this proposal.</p>	d, e, h

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
203	At what point does the Astronomy community listen to the Native People (not the sellouts) but the actual practitioners and value a Hawaiian perspective as knowledge too? That is all I got already, I feel like we have had the same consistent message that "no means no". Apparently, western knowledge is more valued by Astronomers than any other body of knowledge. Did you ever stop and think it is exhausting for a Native Hawaiian to constantly justify our body of knowledge to you all and then you act all surprised when we still don't say yes, and although exhausting we are still here, we are still showing up. Do you know why? You actually do not know why, because to you astronomy knowledge is way more important than land knowledge, yet your whole purpose is to study life outside of this planet. Yet you can not even respect the life that already lives here. So gazillionth time, NO MORE further development on Mauna Kea!!!!	d, e
205	Please stop forcing things on Hawaiian people. Visitors can see this and it's offensive.	
206	I urge you to act for justice and reconsider this plan to use Mauna Kea (Mauna a Wākea) as a site. This is sacred land, with deep cultural, spiritual, and ecological significance. I, like many around the world, firmly oppose ANY new construction on the mauna. Please take good and just action now and be on the right side of history.	d, e
207	No construction. The mauna should be left alone and the voices of the Kanaka Māoli should be respected and listened to in the matter.	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
213	<p>The University of Hawai'i (UH) claims to be an "indigenous serving university" that "embraces its unique responsibilities to the indigenous people of Hawai'i and to Hawai'i's indigenous language and culture." Haven't you heard from the Indigenous people of Hawai'i on this issue? Haven't you already used militarized force to arrest our Indigenous elders who put their bodies on the line to stop the construction of the Thirty-Meter Telescope disaster last summer? I am appalled that the UH would even consider this. If the last 40 years has not been evidence of enough, let me assure you that Native Hawaiians know where we come from and we are not going anywhere. There must be no more construction on Mauna a Wakea - ANYWHERE. The UH has proven itself to be a bad actor and a negligent steward of your lease at best. I am infuriated by how delayed the decommissioning process of this telescope has been with no clear path forward in sight. You have shown so much disdain for the Native Hawaiian people and all that we hold sacred. Literally \$20K spent in 1995 to airlift TRASH from our Mauna - land that is to be kept in trust by the state for the benefit of the Hawaiian people and general public. This telescope would only bring more people, more tourists, more vehicles, more waste, more pollution, MORE CONSTRUCTION AND DESECRATION to our most sacred land. There has never been a geological study of the underlying rock formation of Mauna Kea. How do you know how much fuel and waste and pollution has already accumulated on Mauna Kea? What is the cumulative impact of the 22 telescopes you've allowed on this sacred land? What has the cultural impact been for my people? Please no. Enough is enough! A'ole. Stop disregarding human rights and respect Indigenous voices. Do not build this telescope.</p>	d, e, i
214	<p>Aloha, I have concerns about this new telescope project. In looking at your timeline, Hōkū Pe'a was compeoyed in 2010 and then determined to be decommissioned just 5 years later in 2015. That is a lot of movement on a sacred Mountain. Building, then tearing down, then moving to a new location. You already purchased this new telescope and some it seems in 2016. It is 2020, isnt this technology outdated already. How many years before it needs to be replaced? This trend needs to stop on Mauna a Wākea. No more telescopes. No more building and desecration. Please allow our Mauna to rest. Allow wao Akua to remain sacred. Mahalo.</p>	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
215	The Hawaiian People do not want this telescope on their Native land. Please have some respect, they have been protesting this telescope for so long. Things changed because of COVID-19 but they still feel the same way. Do Not Dishonor the Hawaiians. Mahalo	e
216	I oppose this project on every point which reasonable people and organizations should understand before even considering to propose such a thing. Environment ( destruction ) Decommission process ( timing grossly ignored ) Cultural reality / NO MORE construction on the Mauna.	d, e, i, N
219	I am writing in opposition of this proposed plan. There should be no more construction and development anywhere on the Mauna. Please listen to the protectors and stewards of the land; you do not have their consent. Standing in opposition to this plan does not mean I am against education or science. Simply, I am against this proposal because it uses educational opportunity and scientific advancement as a disguise for what it really is— it is desecration.	d, e
222	No more development should take place anywhere on the Mauna. Respect the fact that you do not have the consent of the Hawaiian people, the people with relationship to put this telescope back on the Mauna.	d, e
223	The proposed site for replacing the telescope is not an option. One of the reasons listed above on this website for building the telescope on Halepōhaku is counterintuitive, replacement of the telescope on the proposed site will not "maintain" UH's connection with Maunakea's cultural significance. In fact, rebuilding this telescope at the proposed site is a direct dismissal of Maunakea's cultural significance. The rebuilding of this telescope will cause more tension on Maunakea, which will be costly to manage. I suggest to find an alternative site and an alternative to building a telescope on Hawaiian lands. I urge UH to be respectful of the land and its people.	d, e
225	Any new development anywhere on Mauna Kea is hewa. There's no other way to put it and there's no way around it. Construction on Mauna Kea is desecration. There is no compromise, there is no "doing it in a culturally respectful way." It is as if UHH has not paid attention to the past year of protest on the mauna. We said no. You do not have our consent.	d, e
226	Listen to the people of Hawai'i, we do NOT need anymore development on our sacred Mauna Kea! How much more will you take from our people? Every telescope was the last one, we are done being taken advantage of. No is No!!!	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
232	<p>No more telescopes on the Mauna</p> <p>Decommission all the unused telescopes as the mauna is a sacred place and space</p> <p>Kanaka do not belong up there I ka wa kahiko, aohe kanaka I noho ai No laila aole kukulu!</p>	d, e
238	No more telescopes on Mauna Kea. Enough.	d
243	<p>I'm at a loss for words. I can't believe the university has the audacity to propose more desecration to this sacred mountain. The Hawaiian people have made it clear many times, they do not want any more telescopes on Mauna Kea. Therefore, number 7 on the list of why to use Halepōhaku, "Utilization of Halepōhaku maintains UH Hilo's strong connection to Maunakea and its cultural and scientific significance" should be amended to remove "cultural" and only read, "scientific significance." No cultural considerations have been made for the people who should have the ultimate say.</p>	d, e
244	We strongly oppose the building of ANY telescope on Mauna Kea.	d
246	<p>NO DEVELOPMENT ON MAUNA KEA!! PROTECT SACRED SITES!!!</p> <p>The current proposed plan does not realistically or accurately consider the affects that this projects will have to the community and ecosystem. If you really care about public comment listen to the people and STOP THE TMT</p>	d, N, O
247	<p>I wish I could explain the pain I feel. The exhaustion. I believe in science. I love astronomy. My ancestors have studied the stars with incredible specificity for generations. But this mountain is SACRED. No should have been and should always be enough. When I first visited Mauna Kea I was overwhelmed with the energy of the mountain. I felt her power. It is a place where heaven touches earth. You do not need to make it to the summit to feel that power. I cried wondering how anyone could justify developing on her. Inflicting violence over and over. Kānaka deserve to be heard and respected. Kū kia'i mauna.</p>	d, e
248	<p>It is more important to listen to native and indigenous peoples than it is to advance academic interests. The people of Hawai'i have made clear that further development on the Mauna would amount to desecrating the site. Enough trauma has been caused by colonizers, including those acting in the name of science and knowledge, and now is the time to make a different choice. As a scientist and a recent PhD, I believe we must listen to the people who occupied the land before us, and do everything in our power to respect their wishes for preserving sacred and ecologically sensitive sites.</p>	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
250	<p>Hale Pōhaku is 9000 ft and is sacred land! What don't you understand about NO MORE DESECRATION!!! Sounds like you folks want to turn Mauna Kea into a commercial zone... 'a'ole. There is no treaty of annexation, you are occupying stolen lands and enough is enough!!!</p> <p>Decommission Hōkū Ke'a as well as the other telescopes and send Hōkū Ke'a to 'Imiloa for the students to explore the facility. No!!!No!!!No!!!</p>	d, e, i, J
251	aole	
253	i would like to day we should wait on any telescope I'm not against it but think the money that will be used for this as well as to police the demonstrators should be used better. This is why i will not vote for Roth. I think we must solve the TMT and other issues first.	i
254	We dont need any more telescopes , you guys should just get permission to look through one of the other ones thats already built. enough is enough.	d, J
256	<p>Aloha, as a Native Hawaiian cultural practitioner I believe that this shouldn't be built. First, TMT has been in court and has had opposition from around the world for over 10 years and the decision has still not been made of what they're going to do. For over 10 years the people of this land have said they don't want another telescope and they will not stop til it is officially not going to be on Mauna Kea. If we can stand for our Mauna for 10 years and counting, what makes you think this new telescope will be welcomed or wanted. besides the fact that it will be deemed useless in a few years due to how low it is compared to telescopes around the world, it is planned to be in an area that is already overdeveloped. the whole mountain is sacred, not just spiritually, but it is an important place environmentally. this new telescope will beyond disrupt the natural landscape, animals, insects, and plants. Please do the right thing and think of the people and the land that are native to this place and chose to preserve it instead of trying to benefit financially off of us and our land. This new telescope is not wanted or welcomed by the native people and it will be faced with opposition. Thank you for taking the time to hear and understand me. Mahalo</p>	d, e, N

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
260	<p>Over the last ten years Thousands of people have gathered upon the slopes of Maunakea to make evident that we do not consent to any further construction on our sacred mauna. In the last two years thats has been made even clearer by the explosion of a political awakening unlike anything Hawai'i has seen since the illegal overthrow of our kingdom.</p> <p>We do not consent to this project. And we will not stand idly by if you pursue it. Our people are organized and our vision is clear. We say 'a'ole. It's time you listen.</p>	d, e
261	<p>Aloha, It's absolutely mind boggling to me that after all these years opposing TMT, you folks would even consider proposing another telescope. I suppose it's unclear to you, so let's make it abundantly understandable, MAUNAKEA IS NOT YOUR PLAYGROUND.</p> <p>Mauna a Wākea is no longer receiving anymore malignant telescopes. The very things that pollute our water table with toxins such as mercury and disrupt that ecosystem.</p> <p>NO, TO YOUR TELESCOPE.</p>	d, e, N
263	<p>This the the most disappointing and disrespectful thing I've heard... you are clearly NOT LISTENING. We said NO MORE TELESCOPES ON OUR MOUNTAIN. NONE! No more telescopes on Maunakea. No more development. The only equipment going up should be to REMOVE what is there as promised! In the middle of a pandemic and at the most opportune time to show you care you propose this kukai! Im beyond offended! Please step down.</p>	d, e
264	<p>There is no place for ANY more telescopes on Mauna Kea. I do not support the further destruction and I do not support the Hokule'a telescope.</p>	d, e
265	<p>Aloha, I write to respectfully oppose this project. There are many unused telescopes on the Mauna already that were supposed to have been removed. Please understand many of us were taught to take care of what is in front of us before moving forward. UH has showed us many times that they are unable to properly care for the Mauna while unnecessarily occupying her. It's not just 'a'ole TMT. It is 'a'ole ANY further desecration. I humbly ask that you please just let our people have what is left!</p>	d, e, h

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
266	<p>To the settler institution of the University of Hawai'i at Hilo,</p> <p>Proposing yet another project under the guise of, “furthering education opportunities” and the promise of “decommissioning,” by moving the Hōkūle‘a telescope from the summit to the lower elevation at Hale Pōhaku is such is such a disgrace. Do you have no shame? After thousands of people of Hawai'i gathered on the frontlines and on the streets calling for a final end to the desecration of our sacred mountain, you have decided to announce a project that you know full well will receive massive resistance, during a pandemic no less. After you saw 38 elders arrested this past summer and solidarity come from many nations around the world, you still have the arrogance and audacity to try to push forward yet another project that would cause destruction and heart ache.</p> <p>As an alumni of UHH, I am constantly disappointed by the decisions carried out by the administration. You know full well that moving a telescope from one place to another isn't actually decommissioning. I oppose this proposal like I oppose any more building of any kind on my ancestral mountain.</p> <p>Do right by the people. Do right by the land. Do right my the lineal descendants of Hawai'i. Stop building telescopes on Mauna Kea.</p>	d, e
267	<p>No more development should take place anywhere on the Mauna. The promised decommissioning process is grossly delayed with no clear path in sight. This proposal will attract even more people to this ecologically sensitive area. Enough is enough!</p>	d, i, M, N
268	<p>As an indigenous serving university, the University of Hawaii has already done so much damage to the health and well-being of Hawai'is indigenous population. The institution has continued to prioritize profit and western science over community health, and this proposition is one example of that. Widespread objection to construction on Mauna Kea is known; proceeding toward further development is insensitive and wrong. I am ashamed to be a UH student because of this mentality of ignorance. I fiercely object to the construction of any telescope on the mauna; not the summit, not Halepōhaku, not anywhere on the mauna.</p>	d, e, O
271	<p>There are enough telescopes on the mauna already. You don't need more.</p>	d

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
273	The BOR should vote “NO” to the construction and implementation of the Hōkūke‘a telescope proposed to be constructed at Hale Pōhaku on Mauna Kea. Size is no excuse for the continued desecration of this sacred mountain. Neither this 28-inch telescope nor the 30-meter one should be built. Enough is truly enough. The decommissioning of other telescopes is grossly overdue and there is no plan in sight; furthermore the removing of telescopes does not give sound reason for new ones to be constructed. All of the telescopes should be removed and none more should be erected. Once again, the university and land holders are paying no attention or care to the sacredness of Mauna Kea or the vibrant voices—now globally expressed— of the people of Hawai‘i who wish to protect this mountain. Please do what is right. Mahalo	d, e, i
274	I oppose the proposed plan for the development of an educational telescope atop Mauna Kea summit. While it is promising of opportunities in jobs and education, the University of Hawaii would be dishonoring their mission to serve the advancement of Native Hawaiian peoples by ignoring the feelings and claims already made concerning development atop Mauna Kea Summit. The University should be listening to students, especially since 2019, and their plea NOT to push further development on culturally and environmentally scared grounds. The University of Hawaii should first concern itself with completing the process to decommission their existing telescope that was never successful. Although the plan is to have a mobile telescope situated on a storage unit that is already there, the University should be leaders in projecting student voices and interest by honoring traditional beliefs in place of new age advancements. Moving forward with anymore development on Mauna Kea is not in the best interest of the Native Hawaiian people and the telescope facility does not offer enough direct benefits to Native Hawaiians. It is not justified or supported to be there.	d, e, N
277	I oppose the relocation/construction of the University’s "teaching" telescope.  Decades of mismanagement of Mauna Kea by the University and other state agencies continues. Resolving the mismanagement must be the next step ... and not relocating/building another telescope, which only compounds the problem.	d, h

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
278	no no no to all of this. there's already an ongoing battle with TMT-- why add another? there are other comparable sites in the world. indigenous rights have been disregarded and disrespected for centuries. when science begins to disregard the wishes of the people who helped to advance astronomy, who is the science actually helping? this seems to be another capitalistic venture.	e
281	Due to Mauna Kea's extreme sensitivity as a physics landscape and as a social emotional conflict dividing our community, i believe it to be quite irresponsible that UH HILO even consider proposing a project that would alter Mauna Kea's landscape at all. There has been an embarrassing amount of care, listening and respect by UH Hilo and the State for that matter, to the kia'i who have tirelessly given testimony, and shown peaceful civil disobedience for the need to protect Mauna Kea from further desecration. As an entity UH Hilo has shown, in my opinion, a pathetic example of listening and consideration to the literal cries from not only the community of Hawaii island and Hawai'i at large, but even your own alumni, students and faculty. The emotional, spiritual negative impact your proposals have made on our community will take generations to undo. And thus your proposal for yet another construction project for a telescope on Mauna Kea is not only irresponsible, unsound and disrespectful, but the fact that you feel you can propose such a project without actually following through with and of your 'plans' to decommission ANY structures polluting the mauna, further invalidates your University as a trustable community entity for Hawaii island. Sit with these feelings. Hear us. Further not listening will only create more community divide and discourse for this very community you claim to lead and be a beacon for. I am a 2012 alumni of UH Hilo, i oppose this proposed project and i hope you will do better by your community and the lands which you rest on. Aloha ma.	d, e, O
282	I strongly oppose the construction of this new telescope on Halepōhaku. Time after time, the university has blatantly disrespected the wishes of Kanaka who see the construction of these telescopes as a desecration of their indigenous lands, and it is shameful that the university has not respected their wishes. Understand that no means no, and please reconsider building this telescope elsewhere.	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
283	<p>I don't know why it is so difficult for you all to understand that construction on Maunakea is not wanted. You are not entitled to keep building and building, turning a sacred mountain into an industrial park. How could you have witnessed the past 10 years of protests, last year's massive blockade, and think that you would be able to propose a new telescope without major backlash. UH has been loosing community confidence, but continuing to constantly challenge Native Hawaiians has turned you into an institution that cares for nothing but money. I love science, and I loved learning astronomy. I understand and appreciate the value of the telescopes atop Maunakea. But science and scientific discoveries and breakthroughs do not exist in a vacuum. Continuing to propose new telescopes and fighting Indigenous people will forever taint the discoveries your telescopes are and will make. You are welcoming the writers of history to view your astronomy program as a violent, colonial institution whose wonderful discoveries were undermined by the violence that took place to get them to the summit of that mountain.</p> <p>Since you all insist on being intelligent scientists and board members, use those big brains of yours and take a step back to truly examine yourselves. Is this the legacy you want for your telescopes, your institution? Do you want to forever be known as the university that continued to ignore and enact violence upon its Indigenous community? Or do you want to be remembered as an institution that made mistakes, but worked diligently to restore the trust of its community by working towards ethical and just science? It's your decision to make. Choose wisely.</p>	d, e, h

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
284	<p>This virtual open house (voh) does NOT provide adequate information to formulate relevant comments to this proposed project. For example, the Halepohaku Area Map does NOT even show the proposed location of this telescope. This voh also lacks visual renderings showing any potential visual impacts in the surrounding environment. There is only a small photo insert which is terribly inadequate. Most of this voh focuses upon the benefits of this telescope, not any of the potential impacts.</p> <p>UH hasn't even decommissioned the Hōkū Ke'a, yet it wants to construct another one on Mauna a Wākea. This telescope should be erected on the grounds of the 'Imiloa Astronomy Center, a site that would be more accessible to K-12 students and the general public. This is why the 'Imiloa center was built in the first place to provide educational accessibility regarding astronomy and science. Most K-12 classes do NOT go to Hale Pohaku area due to transportation logistics and liabilities. If UH really wanted to "bring the process of astronomy research closer to more Hawai'i Island K-12 students and local residents who would not otherwise be able to go to the summit of Maunakea", then this telescope should be placed at 'Imiloa. Also, if astronomy undergraduate students from UH are going to be trained on telescopes for career and educational advancement, then UH should be using their other large UH88 telescope as well as allocating their viewing times on the other existing telescopes on the summit to their students.</p> <p>UH/OMKM has failed to implement direct consultation with Native Hawaiian organizations, lineal descendants, and cultural practitioners regarding this proposal. This proposed project also lacks direct consultation with ancestral akua, kupua, and kupuna of Mauna a Wākea who might be directly impacted.</p>	d, e, h, i
285	<p>No Hōkūke'a telescope at Halepōhaku. No more development! UH has STILL refused to an action plan for the decommissioning process. No new talks of ANYTHING until that is addressed and actions/timelines begin. No more "good faith" because there is no faith. That should be enough, but here's a second reason: how do you expect a largely ecologically sensitive area to stay intact with multiple people on said site. Where are your brains in this process??? For once, LISTEN to what is pono. Your continued glance at money over what is pono is disheartening and disgusting. Be responsible to this planet, to Hawai'i, to your mission, to your host culture.</p>	d, e, i, N

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
287	A'ole! No more building on the Mauna. As an organization who builds off of and profits from Kānaka and our culture and who saw our response to TMT, how dare you propose this. Do not build any more on this land, fulfill your promise to promptly remove the old telescopes instead.	d, e, i
289	I am opposed to the building the the proposed educational telescope at Halepohaku or anywhere on Mauna Kea. Development on the mauna after the lease award in 1968 has all caused significant and adverse harm to the environment and to our communities. Proposing yet a another project on Mauna Kea is disrespectful especially given the current situations with the TMT project. We as a community do not need any more so called "opportunities for education" we need healing and restoration. Western science, developers and partner organizations have all proven incapable of properly managing the mauna and her resources and therefore should not be allowed to build anything further on the mauna.	d, e
291	I am opposed to locating Hoku Kea at Hale Pohaku. Listen to the grassroots Hawaiians opposed to any further development on the Mauna. Put Hoku Kea on UH Hilo campus. Show some respect for sacred Mauna. No more trampling on the souls of the Hawaiian people to look into space. Mahalo.	d, e, J
293	There are one to many telescopes on Mauna Kea as it is. We don't need another one or TMT. There are 13 telescopes total and of those five are not working and need to be decommissioned. You take down one telescope only to put up another is not right. You can't put up a TMT so you decide to slide in a dome telescope instead. WE DON'T NEED ANYMORE TELESCOPES ON THE MAUNA, PERIOD!!	d
295	Please do not build further on Maunakea. Native Hawaiians have been vocal for years about the sacredness of the mountain and protested the building of other infrastructure. Shame on you for not listening to the people of Hawaii. I hope you will reconsider this project.	d, e
296	The cultural significance of Maunakea is more important than one more telescope on the Mauna. Please listen to people's voices and especially to Hawaiian people on this matter before rushing into action. Respect is part of Aloha, I am hoping UH Board of Regent can practice that by creating a long term care plan for Mauna Kea.	d, e
298	NO MORE TELESCOPES! NONE	d

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
299	<p>What makes UH entitled to using that site?With everything that transpired thus far on the Mauna and the concerns of many of the kanaka maoli, it seems disrespectful to not take that into consideration. This is not right, shame on UH. I do not support this site. Take it elsewhere.</p>	e, J
302	<p>Our Hawaiian community have been going at this issue for over ten years now. When will you get the message NO MORE TELESCOPES ON MAUNA KEA!! Over and over again, Mauna Kea is sacred to us! Over and over gain you keep disregarding the Hawaiian people and their culture and the importance of keeping the Mauna from any more desecration!</p> <p>Why not have this educational telescope situated on the university grounds!!! It seems appropriate there! It does not have to be on Mauna Kea. The hands-on idea and "high standards" can still be addressed there on the university campus. The night sky can be seen from the campus.</p>	d, e
303	<p>Our kānaka have been fighting to protect our sacred mauna from TMT for years. It's been a little over a year since our last stance, and there is the audacity to build another telescope? Are the thousands of kia'i and innocent arrests on our kūpuna not enough for you to stop trying to increase the amount of telescopes on Mauna Kea? Where is the humanity? I understand you'd like to educate your astronomy students, but you're missing the point. Our mauna is sacred. Our origin of our creation story of Hawai'i comes from the mauna. You've seen the amount of restless nights the protection of our most sacred required. The wails of our kānaka, the agony and pain that we've faced for so many years as a nation. To stay silent &amp; not stand up for your culture is what the oppressor taught us. But you can't oppress us for no longer. In the name of science, please consider study abroad options for your students because studying on our most sacred isn't in your best interest right now - in fact it never was. And if you made it this far in my comment, I really hope you digest everything that has been said and make a decision based off of humanity for kānaka rather than greed for haole.</p>	d, e, J
307	<p>It does not make sense, that we fought against a massive telescope being built, only for another telescope (barely a year later) to start being put up for approval. There are several up there already. Make repairs/tech upgrades. Better yet, just take them down. There is no need for so many to be up on a sacred mountain that is protected by its people. If this gets approved by some crazy chance, you can bet that there will be yet another protest.</p>	d, e
308	<p>NO to any construction on Mauna Kea</p>	d

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
310	<p>Another 'foot in the door' at Halepohaku.</p> <p>One local Senator suggested moving the Imiloa Astronomy Center restaurant &amp; gift shop to the location too.</p> <p>Far too many unanswered legal questions about the land &amp; the road to continue any more industrial activity on the mauna.</p> <p>Send the Hoku Kea to the trash heap of bad management history. There are far more important issues that need our tax dollars.</p>	d, g, J
313	<p>This is a horrible idea. If Indigenous people are opposed to construction on their land then listen to them!</p>	d
315	<p>You ought to be kidding me UHH! I cannot believe you would even propose such a thing!</p> <p>I'm writing in opposition to Hōkūke'a telescope being built at Halepōhaku!</p> <p>NO MORE DEVELOPMENT on the mauna! Hasn't the message been LOUD &amp; clear, this isn't what the people want! Stand with the people!!</p> <p>Decommission the mess that's already been made! Clean up your opala!! Long overdue and should have been done without anyone telling you to do so!</p>	d, e i
318	<p>Do not build another telescope on Mauna Kea, or any other sacred mountain on this archipelago. Native Hawaiians, local residents and allies all over the world have been fighting the desecration of sacred land. You saw what happened on Mauna Kea since last summer, why would you think it's a good idea to propose a new project? STOP TRYING TO BUILD MORE</p>	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
325	<p>I'm a Hawaiian Studies major. I'm native Hawaiian. 2015, 2019 those were years where I could not focus - not even 1% on my studies. TMT on Maunakea and really UHH mismanagement of the Mauna caused unprecedented stress on yes me, but also my community. 2019 I believe showed that no further development would be allowed by the community on the mauna, especially after the lack of trust that UHH has shown to the community. ANY building on the mauna is not okay with me and should not be brought up in the future, especially until all decommissioning is complete. Is it unjust that students at UHHilo astronomy department do not currently have a telescope to practice on? Yes. However, if creating a new building for them on the mauna would mean that the indigenous people of this place will be unable to perform day to day activities or be anything but thriving because of it, then it should not be considered. An alternative-schedule telescope time for said students on the telescopes currently on the mauna. It should be a requirement that they donate x amount of hours specifically to UHH students. NO telescope needs to be built- it's there- when it's no longer there, things like brighter street lights so that kids don't get ran over at night should take priority over astronomy. This is a strong no. Please allow me &amp; the community to rest.</p>	d, e, J
327	<p>There should be no more development taking place on the Mauna. With everything that happened last year and the many years previous, the University should have enough respect for kanaka to stop trying to encroach on their sacred lands. You teach students that no means no, but then go on to ignore the lack of consent from kanaka.</p>	d, e
332	<p>It's wrong to keep pushing this telescope on the Mauna. The Hawaiian people have proven time and time again that desecration of the land is not what they want. what else is needed to make these scientists change the location? No-Go for me. I wish I could write eloquently and have a whole speech but the bottom line is- Just stop. And change the location.</p>	d, e
333	<p>UH has NO RIGHT to be anywhere on Mauna Kea. PERIOD. I am completely enraged that you even have the nerve to ask!!! Mauna Kea is NOT YOURS TO BUILD ON! PERIOD! It belongs to the Hawaiians.</p>	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
334	If the UH is already in the process of decommissioning observatories on the Maunakea summit, it wouldn't make sense to add a telescope to the area. Not to mention that Halepohaku is an ecologically sensitive area and will have a significant effect on the local ecosystems.	d, i, N
337	Please do not set up a new one here. This is not a great spot.	
338	<p>Aloha to all who are concerned,</p> <p>My name is (REDACTED) and I am in opposition of the New Educational Telescope being built on Maunakea. There are three main reasons for this argument: 1. Maunakea is sacred to the people of Hawaii, not just Hawaiians, 2. From a PR perspective, building a telescope at this time of high tension, would be a huge mistake as there is already great mistrust in the university from the publics point of view, and 3. Building another telescope, no matter how small or big, would open the doors for further development of an incredibly valuable conservation district.</p> <p>1. Sacredness is defined by the Merriam-Webster Dictionary as an object set apart for the service or worship of a deity; highly valued and important. By these definitions, Maunakea is indeed sacred. The relationship between Wākea, one of Hawaii's most venerated deities, and Maunakea is well documented in Hawaiian Newspapers, and Hawaiian cosmogonies. These pieces of evidence also go on to explain Maunakea's services to Hawaii, from the breaker of hurricanes and other storms to the collection of water (YES THERE ARE WATER TABLES IN MAUNAKEA THAT FEED THE ENTIRE ISLAND!!!). With all these services, it is easy to say that Maunakea is also highly valued and is quite important to EVERYONE IN HAWAII. Disrupting these services in anyway, no matter how small, could have devastating effects on the ecosystem as a whole.</p> <p>2. Maunakea is the subject of heavy controversy at this point of time. The TMT case was poorly planned and as far as the public knows, there has been know headway in the decommissioning process. To build anything on Maunakea, even if it is small, would and more fuel to the conflict over this sacred mountain. With the TMT case, covid-19, and other pending cases against the University, public trust and perception of UH is at an all time low. If the university wants to build trust with the public, I suggest building more centers such as 'imiloa, in different areas around the island. This would be a better option for reaching kids in different rural communities around Hawaii Island that cant afford to be transported all the way to Hale Pohaku.</p> <p>3. This telescope, though its intentions are good, the means by which its being done would open up more opportunity to develop this conservation district. The ability to see the stars is not comparable to the value of the native species of Maunakea, some of which only grow on this mountain and no where else in the</p>	d, e, g, h, J, M, N, O

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
	<p>world. If the University of Hawaii is dedicated to science then it should also consider the biological life that lives on the mountain, most of which are on the endangered species list. There is really no possible way to measure the affect this project would have on the biological life in the area until the damage is done. Let us not be reactive in saving the little native species that remain on Maunakea.</p>	
342	<p>I oppose the the siting of the Hōkūkeʻa telescope at Halepōhaku. The land is sacred and culturally significant, is already being mismanaged, and there should be no more development there.</p>	d, e, h
343	<p>Hewa. How can any person or organization stand for desecration of sacredness? A`ole to any more construction of telescopes in Hawai`i, most especially by an institution that claims to benefit Hawai`i and its people.</p>	d, e

# Appendix 4 – Comment Analysis

COMMENT ANALYSIS – OPPOSE NEW EDUCATIONAL TELESCOPE AT HALEPŌHAKU		
ID #	COMMENT	TOPIC CODE
347	Aloha e nā pulapula ‘o Hāloa, my name is (REDACTED) and I am a student at the University of Hawai‘i at Mānoa. I am writing in opposition to the proposed transportation of the Hōkūke‘a telescope from the observatory at Maunakea’s summit to Hale Pōhaku. I implore you all to secure another space for this telescope that is not located on any lands of Maunakea. As many of you may be familiar, this past year was flooded with social-political movements like the Mauna Kea movement that has helped to sculpt and solidify lāhui and allied support in opposition to its proposed plans. I forecast similar responses and opposition from the public seeing that this telescope will not only further desecrate the lands of Mauna Kea but is in violation of native Hawaiian traditional values. Mahalo nui for your time.	d, e
348	Strongly propose any continued development on Mauna Kea or any other sacred spaces in the name of science. Kanaka Maoli have never given consent for TMT or any other observatory to be built on Mauna Kea. Building without consent on Mauna Kea is a violation of human and internationally recognized rights.	d, e
349	NO MORE TELESCOPES ON MAUNA KEA. NO MORE DEVELOPMENT ON MAUNA KEA. RESPECT NATIVE HAWAIIANS, THEIR CULTURE, & THEIR LAND!	d, e
350	<p>Aloha,</p> <p>My name is (REDACTED) and I've been working for the protection for Mauna Kea for the last decade. I am writing to express my strong opposition to the tone deaf proposal to site Hokukea at Halepohaku. UH has been given many opportunities to change course on Maunakea as demanded broadly by the community, yet, each time, they choose to selfishly and singularly pursue their research agenda at the expense of a respectful relationship with practitioners and the mauna itself. UH would be wise to envision a future for their Astronomy Program without Maunakea -- building a teaching telescope anywhere on the mauna is a step in the wrong direction. In considering alternatives, did you consider not building at all? Simply decommission and remove Hokukea from the mauna.</p> <p>One of the gains made through the 2015 direct action, after years of legal battles, was a commitment by UH to start decommissioning 3 telescopes -- a small concession as you are required to do so anyway. I didn't pay too much attention when Hokukea was named as 1 of the 3 sites selected to be decommissioned -- until I heard that you want to re-site it at Halepohaku. Just because it's off the summit, does not mean that it is appropriate. Halepohaku is still an ecologically sensitive area with beautiful māmane and silversword plants that will be threatened by increased traffic and human activity. Let the mauna rest -- all of it. Please don't site Hokukea at Halepohaku.</p>	d, e, i, J, M, N